

Chapter 1 Freight services in Indian Railways

Executive summary

Freight is a profit making business segment of Indian Railways and is the backbone of railway revenues. Over the years the market share of Indian Railways has been consistently shrinking and railways was losing out to road. Indian Railways laid down detailed freight operational and marketing strategies for the X Five-year plan to regain the lost market share. Achievement of projected freight targets largely depended on the manner in which the Indian Railways reshaped its policies and strategies not only to regain the lost share in freight traffic but also to provide value for money to customers in terms of better facilities and improved services.

This Performance Audit was aimed at assessing the adequacy of infrastructure commensurate with freight traffic growth envisaged in the operational and marketing strategy of Indian Railways. It is also intended to assess the effectiveness of initiatives taken to improve market share of Indian Railways besides efficient maintenance and optimum utilization of available assets.

The recent growth in freight loading due to more intensive asset utilisation and adoption of market responsive strategies has brought into focus its long term sustainability. Subsequent reviews of the impact of enhanced loading in the zones have amply demonstrated that the current infrastructure was overstretched and capacity enhancement was essential to sustain the enhanced loading strategy in the long run.

Study conducted across the zones indicated that Indian Railways has thus far continued with the strategy of augmenting locomotives largely from its existing manufacturing facilities- Diesel Locomotive Works, Varanasi and Chittranjan Locomotive Works, Chittaranjan- whose manufacturing capacities were not sufficient to meet the planned annual augmentation of locomotives. Neither was the capacity of these manufacturing facilities enhanced nor was external procurement of locomotives adequately pursued. Augmentation of locomotives, therefore, did not keep pace with growth of traffic. Augmentation of wagons is primarily from wagon manufacturers in public and private sector. There is a case for improved contract management with effective deterrence on defaulting public and private wagon manufacturers, who were persistently supplying only 33 to 51 per cent of the contracted quantity every year, adversely affecting availability of wagons in the zones. As a corollary, the scarcely available funds, ranging from Rs.387 crore to Rs.1,864 crore remained unutilised during 2006-09.

The various initiatives envisaged for capacity augmentation, throughput enhancement, port connectivity works and upgradation of permanent way, were plagued by procedural delays and were behind schedule. Infrastructure augmentation was, therefore, not commensurate with the projected growth in freight traffic and Indian Railways had a huge throw forward of 408 projects

costing Rs.1,41,015 crore (including the Dedicated Freight Corridor) as at the end of March 2009.

The initiatives for harnessing private investment for infrastructure augmentation through Public Private Partnership arrangements have not materialized as envisaged. Setting up of locomotive manufacturing facilities, and initiatives to recapture the road traffic such as development of multi modal parks and Roll –On-Roll-Off facility to provide door to door multi modal service were all in preliminary stages.

Major freight terminals that handle more than 30 rakes every month, including those identified for modernization were also deficient in basic facilities leading to heavy terminal detentions of rolling stock, which needs to be urgently addressed. Majority of the respondents to the survey of terminal/siding owners also echoed similar sentiments. Customer perception also indicated that the mechanism of supplying rakes as per the demands of customers required improvement. This coupled with enroute detentions to rakes on account of stabling and inefficient interchange commitments between zones were bottlenecks in efficient delivery of freight services.

A test check in loco sheds disclosed that several locomotives were increasingly failing within a short span of six months of their periodic overhaul indicating poor workmanship in the sheds. The quality of maintenance of locomotives, therefore, warranted improvement.

The various freight schemes introduced to capture piece meal traffic were only operating sporadically in some zones. Performance of the individual incentive schemes in terms of incremental freight loading achieved was not evaluated. Considering that the average annual growth of 8.1 per cent in freight loading more or less corresponded to the average annual growth of 8-9 per cent in Gross Domestic Product during the last five years, the incentive schemes at best contributed to retention of the market share. The marketing strategy needs to be restructured for improving the market share of Indian Railways.

1.1 Highlights

- **Capacity and manufacturing constraints in the two locomotive manufacturing units at Varanasi and Chittaranjan hampered locomotive augmentation vis-à-vis the growth in traffic. Only 11 per cent of the envisaged external procurement was provided in the Rolling Stock programmes, leading to shortage of locomotives. Procurement was not synchronised with requirements in the zones affecting the availability of locomotives in zones.**

(Para 1.9.1.1)

- **Remedial measures were not in place even though the public and private wagon manufacturers continuously supplied only 33 to 51 per cent of the contracted quantity, adversely affecting availability of wagons in the zones. Funds ranging from Rs.387 crore to Rs.1,864 crore, comprising 12 to 31 per cent of the funds allocated for augmentation of rolling stock, remained unutilised during 2006-2009.**

(Para 1.9.1.1)

- **The augmentation of specialised wagons envisaged in the Integrated Railway Modernisation Plan was being augmented at a very low scale even though four of the five year period of the plan had lapsed.**

(Para 1.9.1.1)

- **Major freight terminals handling more than 30 rakes every month also suffered from inadequate infrastructure and were not receiving adequate importance. The envisaged modernisation of freight terminals with enhanced facilities were not fully implemented in most of the terminals resulting in heavy terminal detentions to rolling stock.**

(Para 1.9.1.2)

- **Progress of capacity augmentation and throughput enhancement works was characterised by procedural delays and the pace of progress of these works rendered them unlikely to be completed within the envisaged period. Port connectivity works and upgradation of permanent way were similarly behind schedule. Dedicated Freight Corridor was at a primitive stage and even land acquisitions were not completed since setting up of the special purpose vehicle in 2006.**

(Para 1.9.1.3)

- **Customer perception indicated that the mechanism of supply of rakes to customers was inefficient. Further frequent stabling of rakes and inefficient interchange commitments between zones impeded efficient delivery of freight services.**

(Para 1.9.2.1)

- **Quality of periodic maintenance in locomotive sheds was poor as a substantial 25 per cent of locomotives failed on account of poor workmanship. The time involved in train examination in wagon maintenance depots continued to be beyond the envisaged norm due to operational and manpower constraints apart from deficient infrastructure.**

(Para 1.9.2.2)

- **The freight incentive schemes introduced to improve the market share of piece-meal traffic were not successful in improving the market share as envisaged. The commodity wise loading under the incentive schemes contributed to only 10 per cent of the traffic for all commodities except cement. Scheme wise data was not maintained and the performance of the individual schemes was not evaluated.**

(Para 1.9.3.1)

- **The envisaged Public Private Partnership projects for setting up of locomotive manufacturing facilities were at a nascent stage. Development of multi modal parks and Roll on Roll off schemes for capturing road traffic have not yet materialised though four years have lapsed since it was envisaged.**

(Para 1.9.3.2)

1.2 Gist of recommendations

- Indian Railways need to expedite augmentation of rolling stock, including those envisaged in the Integrated Railway Modernisation Plan, to ensure that the rolling stock infrastructure adequately caters to the projected growth in traffic. Indian Railways also need to address, on priority, the zonal imbalances in the availability of rolling stock.
- Contract management practices need to be strengthened and effective deterrence needs to be instituted on defaulting public and private wagon manufacturers to ensure timely supply of wagons.
- Indian Railways need to expeditiously provide the basic facilities in all freight terminals. Indian Railways should ensure that its initiative of modernisation of freight terminals is effectively implemented in the zones to minimise rolling stock detentions at freight terminals.
- Indian Railways need to expedite the capacity augmentation, throughput enhancement and port connectivity works to ensure that the infrastructure is commensurate with the projected traffic volume. Indian Railways needs to effectively monitor and curtail procedural delays in works contracts.
- IR needs to ensure adequate availability of power to haul the freight train, besides curtailing stabling of rakes enroute and improve the interchange commitments between zones to minimise enroute detentions and to enhance the efficiency of freight services.
- Indian Railways need to enhance the quality of locomotive maintenance and address the infrastructural and operational constraints to strengthen the mechanism of train examination at wagon maintenance depots. Indian Railways should provide train examination facility at all freight terminals to prevent avoidable empty haulage of rakes.
- Indian Railways should evaluate the incremental loading derived from incentive schemes and modify the schemes suitably to enhance the freight market share.
- Indian Railways need to expedite all the Public Private Partnership projects to effectively harness private investment. The initiatives aimed at capturing the road traffic also needs to be quickened. Alternatively, Indian Railways should explore other means of capturing such traffic in the short and medium term.

1.3 Introduction

Indian Railways (IR) is one of the largest and busiest rail networks in the world spread over a network of 64,015 route kilometers and is a chief carrier of the bulk freight traffic. Revenue from freight services (Rs.46,425 crore) account for about two thirds of the gross railway revenues (Rs.71,720 crore) and therefore management of freight services assumes greater importance. However, railway transportation is a derived demand and is directly dependent on the growth of six major infrastructure industries in the country viz.

electricity, coal, steel, crude petroleum, petroleum refinery products and cement, to which majority of railway customers belong. During the X Five year plan, IR recorded a phenomenal growth in freight loading, which was attributed to market focused strategy aimed at capturing large volume of traffic along with the efficient utilisations of assets. The enhanced freight loading strategies, however, impact the rolling stock consisting of locomotives and wagons, track and signals apart from affecting other service departments. Further the rapid economic growth accompanied by growing market competition in recent years presents a challenge to IR to reorient its operations through cost cutting and volume maximizing strategies.

1.4 Organisational structure

At the Railway Board, Traffic Commercial directorate formulates policies on tariff and marketing strategies while the Traffic Transportation directorate monitors the movement of traffic of different commodities. The two directorates function under the overall control of Member Traffic. In the zones, the freight business operations are vested with the Chief Commercial Manager, Chief Commercial Manager (Freight Marketing), Chief Operations Manager and Chief Freight Transport Manager. In divisions the Sr. Divisional Commercial Manager is responsible for implementation of policies and Senior Divisional Operations Manager is responsible for freight operations.

1.5 Audit objectives

The objectives of the Performance Audit of Freight Services in IR are to assess whether:

- Infrastructure was adequate and commensurate with growth in freight traffic as envisaged in the operational and marketing strategy of IR;
- Available assets were utilised and maintained efficiently; and
- Initiatives for improving IR's market share were adequate and effective.

1.6 Audit scope, criteria and methodology

The performance audit covered the five year period from 2004-05 to 2008-09. The scope of audit included study and evaluation of the major aspects that impact freight services such as infrastructure augmentation, utilisation of assets and initiatives for improving the market share of IR.

The various policy initiatives, guidelines and instructions issued by the Railway Board from time to time on the aforementioned facets of freight services were used as criteria for assessing the performance of IR. The audit methodology included examination of records at the Railway Board, Zonal Railway Headquarters and field locations and analysis of relevant quantitative data. A survey of owners /users of freight terminals was also conducted to harness their perception of freight services provided by IR. The survey questionnaire is given in **Annexure I**

1.7 Sample selection

The Performance Audit for evaluating freight services was conducted across all the 16 zones. Data was collected for the entire zone for trend analysis and

other macro level analysis. Micro analysis to evaluate the position obtaining in field locations was conducted on a judgmental selection of a representative sample of the various activity centres as indicated below: A representative sample of 173 major terminal/siding owners was surveyed in the zones.

SI No	Activity centre	Sample selected
1	Division	39 Divisions
2	Terminals (Sidings /Goods Sheds)	110 terminals (loading /unloading terminals) handling more than 30 rakes per month
3	Inter-change points	53 points
4	Carriage and Wagon depot	47 depots

Detail of Sample size is given in **Annexure II**.

1.8 Acknowledgement

The audit objectives, scope of study and methodology were discussed with Member (Traffic) at Railway Board as well as with General Managers /concerned departmental heads in the zones by the Principal Directors of Audit during entry conferences. The inputs provided on various aspects including the suggestions on sample selection and the cooperation extended by railways is acknowledged with thanks. The audit findings and recommendations were discussed with Member Traffic, Member Mechanical and Member Engineering in an exit conference held in February 2010. Similar exit conferences were also held by the Principal Directors of Audit in the zones, with concerned zonal authorities.

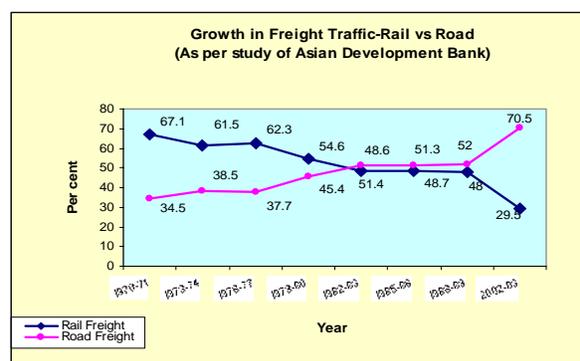
1.9 Audit findings

The results of the Performance Audit of Freight services in IR are given in the following three sections.

- Augmentation of assets and infrastructure
- Utilisation and maintenance of available assets
- Improvement of freight market share

1.9.1 Augmentation of assets and infrastructure

Over the years, the railways' share of the total transport sector has come down from 53 per cent in the IV Five-year plan (1972-1977) to 37 per cent in the IX Five-year plan (1997-2002) due to inadequate investment in infrastructure and competitive weakness vis-à-vis other modes of transport. A study by Asian Development Bank also indicated a declining market share of IR as shown in the chart alongside.



The X Five-year plan (2002-2007), therefore, envisaged a target of 624 million tonnes of originating freight traffic by the terminal year of the plan (an average annual growth of four per cent from the terminal year of the IX plan period) and laid down detailed freight operational and marketing strategies to regain the lost market share, to strengthen the high density network and to improve efficiency, throughput and average speed of freight trains. The strategy also comprised operating freight trains by enhanced loading of wagons beyond their carrying capacity after complying with certain pre conditions to protect the permanent way (track) and rolling stock (wagons and locomotives). As a result during the X Five-year plan, IR recorded a phenomenal growth in freight loading and carried around 727 million tonnes of freight during the year 2006-07 at an average annual growth rate of 8.1 per cent. The XI Five year plan (2007 to 2012) emphasises on capacity enhancement to handle the projected growth in the medium and the long term through quick yielding investments.

A review of the augmentation of assets and infrastructure over the five year period from 2004-05 to 2008-09 revealed inadequacies in augmentation of rolling stock, modernisation of freight terminals and strengthening of permanent way and the capacity augmentation works were progressing slowly as brought out below:

1.9.1.1 Rolling stock

Rolling stock comprising of locomotives and wagons is the backbone on which freight movement depends. The augmentation of locomotives and wagons is planned centrally at Railway Board every year by means of a Rolling Stock Programme (RSP) and allotted to zones.

Locomotives

The augmentation of diesel and electric locomotives is primarily through the manufacturing facilities of Indian Railways – Diesel Locomotive Works, Varanasi (diesel locomotives) and Chittaranjan Locomotive Works, Chittaranjan (electric locomotives). Zones draw up power plans to assess and project their respective requirement of locomotives for passenger and freight services. As at the end of 2007-08, the overall holding of electric and diesel locomotives across IR was 3,443 and 3,933 respectively. A review of augmentation of locomotives vis-à-vis the requirement disclosed as under.

Augmentation of locomotives

Railway Board reckons the manufacturing lead time of locomotives as three years and accordingly plans augmentation considering the traffic projections, replacement of overaging fleet and funding constraints. However, the planning, was predominantly based on projected traffic requirements and was flawed since the planned annual augmentation of locomotives always far exceeded the manufacturing capacities of both Diesel Locomotive Works, Varanasi and Chittranjan Locomotive Works, Chittaranjan. IR primarily relied on its manufacturing facilities for augmentation of locomotives. The persistent gap between the annual requirements and manufacturing resulted in

heavy carry over of requirements (termed as throw forward) to subsequent years as tabulated below.

Types of locos	Year	Carry over balance	RSP Provision	Manufactured during the year	Throw forward
1	2	3	4	5	6
Diesel Locomotive Works (DLW)					
Main line locos	2004-05	94	208	121	181
4000 HP Locos		48	27	15	60
Main line locos	2005-06	181	126	148	159
4000 HP Locos		60	55	22	93
Main line locos	2006-07	159	0	186	(-) 27
4000 HP Locos		93	0	39	54
Main line locos	2007-08	-27	146	163	(-) 44
4000 HP Locos		54	161	59	156
Chittaranjan Locomotive Works (CLW)					
Main line locos	2004-05	114	124	90	148
6000 HP Locos		98	0	22	76
Main line locos	2005-06	148	107	129	126
6000 HP Locos		76	42	25	93
Main line locos	2006-07	126	209	150	185
6000 HP Locos		93	28	36	85
Main line locos	2007-08	185	286*	145	326
6000 HP Locos		85	205	55	234

* Includes 100 locos planned to be procured from BHEL

IR estimated a shortfall of 700 diesel and 700 electric locomotives by the end of the XI plan period and considered acquisition of locomotives to meet the shortfall apart from contemplating (August 2006) setting up of new manufacturing facilities for manufacture of High Horse Powered electric (12000 HP) and diesel (6000 HP) locomotives through Public Private Partnership (PPP) to cater to growing traffic requirements in the long term. In spite of heavy annual throw forward of requirements, IR continued with the strategy of augmenting locomotives largely from its existing manufacturing facilities at Varanasi and Chittaranjan rather than expeditiously exploring procurement options or alternatively enhancing the capacities of these units. Therefore, by October 2009, only 11 per cent (150 out of 1,400 locomotives) of the contemplated acquisition was provided for in the Rolling Stock Programmes (100 in 2007-08 and 50 in 2008-09). The first order on M/s BHEL was placed only in December 2007 and 11 locomotives have been received up to November 2009 from M/s BHEL.

Further, the setting up of two green field locomotive manufacturing plants in Madhepura and Saran districts in Bihar through joint venture were still in the nascent stage three years after they were envisaged, though IR estimated the contracts to be in place by 2008-09. Owing to non receipt of bids from the short listed bidders, the projects were approved as production units by the Government (February 2009) but further processes were not yet initiated.

IR in its response (March 2010) conceded that it primarily relied on the production capacity of its Production Units for augmenting locomotives and accepted that there was a persistent gap in requirement and acquisition of both

electric and diesel locomotives. IR further mentioned that keeping in view the budgetary requirement for various projects the locomotive plants were again proposed to be taken up as joint venture projects. This highlighted that the planning process was flawed as the funding mechanism was not firmed up before obtaining Cabinet approval for setting up of these plants as railways' own production units.

Linkage with zonal power plans

The annual Rolling Stock Programmes had no linkage to the zonal power plans and was, therefore, not synchronised with requirements affecting the availability of locomotives vis-à-vis requirements in the zones. Shortage of electric locomotives was observed in five (SER, ECoR, SECR, ER and ECR) out of the eleven zones, which had electric traction (data was not available in two zones- WR and WCR); two zones (SCR and NCR) had assessed that locomotives were surplus to its requirement, while locomotives were commensurate with requirements in the other four zones (SR, NR, CR and SWR). Similarly, shortage of diesel locomotives was observed in three zones (SECR, NER and ECR) while in three zones (SER, NWR and SCR) the locomotives were in excess of requirements.

Owing to shortage of electric locomotives, zones were deploying diesel locomotives on electrified traction. In SER, which had 85 per cent of its route kilometers on electrified traction, the excess holding of diesel locomotives ranged from 126 (in 2006-07) to 152 (in 2004-05) locomotives during the period from 2004-05 to 2008-09 under review. Apart from lending diesel locomotives to two contiguous zones, SER was deploying diesel locomotives, which had a comparatively higher cost of operation, on routes with electrified traction. To have a perspective of the cost implication, deployment of diesel locomotives in 12 electrified sections, in SER, during the period 2004-05 to 2008-09 resulted in an additional expenditure of Rs.435.71 crore on fuel consumption alone. The zone stated that moving freight was the main objective and both diesel and electric locomotives had to be used to manage the growth of traffic. The fact, however, remained that due to shortage of electric locomotives, the zone carried traffic by deploying diesel locomotives, which had a higher cost of operation.

Further, in SCR even with introduction of improvised versions of diesel locomotives having lesser maintenance schedules, the zone while assessing its requirements of locomotives continued to provide a cushion of 10 per cent towards unforeseen repairs, while analysis revealed that locomotives receiving unforeseen repairs never exceeded seven and a half per cent.

IR in its reply (March 2010) mentioned that growth of traffic in most of the zones facing shortage of locomotives was above the IR's average growth and accepted that the increased overall growth in freight loading resulted in increased requirement of locomotives. As such the Rolling Stock Programmes of locomotives could not match the bare requirement of locomotives for efficient movement of freight traffic. IR also stated that diesel locomotives were deployed in electrified territories due to operational requirements (i.e. the locomotives were required to move from one non-electrified territory to

another with the load through an electrified territory) and that modern state-of-the-art diesel locomotives will work to a higher availability and will offset any disadvantage due to higher operational cost.

However, even in the scenario of overall shortage of locomotives in the system, availability of locomotives was surplus to requirements in some zones and therefore the deficiency in the system was non synchronization of the procurement plan with the zonal power plans. Further, presently the modern diesel locomotives comprised a negligible per cent of the overall diesel locomotive holding and therefore operating diesel locomotives under electrified traction invariably involved a higher cost of operation.

Management of locomotives

Inadequacies in the management of locomotives were seen in the zones. Rakes were persistently detained at freight terminals (goods sheds and sidings) for want of power (locomotives) even in zones that had adequate or surplus locomotives (SR, NWR). Out of 1,300 loaded rakes transported from Jaisalmer in NWR, during April 2006 to September 2008, 356 rakes comprising 27.38 per cent suffered detention due to delay in arranging power for double headed movement, involving a loss of earning capacity of Rs.4.63 crore. Similarly, in SR failure to arrange a high powered locomotive or alternatively a banker (additional locomotive) invariably detained rakes moving into Tamilnadu Electricity Board siding, Mettur Dam and Southern Iron Steel Company Limited sidings, Mecheri Road at Karuppur and Omalur stations involving a loss of earning capacity of Rs.8.89 crore. In J.K.Cement Siding of WR, which offered an average of 16 rakes of cement traffic per month, loaded wagons were constantly detained in the yard for a duration ranging from two to 59 hours due to non-availability of locomotives. From April 2006 to March 2009, 585 rakes comprising 58,078 wagons were detained for 4,99,805 hours causing loss of 20,826 wagon days.

IR while accepting (March 2010) shortages of locomotives vis-à-vis requirements added that in a system which had shortage of locomotives, detentions to rakes in certain pockets was unavoidable. However, detentions to rolling stock were constantly occurring even in zones with surplus locomotives and the management of locomotives was therefore inadequate.

Wagons

Augmentation of wagons is primarily from wagon manufacturers in public and private sector and a small fraction of the requirement is met from in house manufacturing in designated railway workshops. As at the end of 2007-08, the overall Broad Gauge wagon holding across IR was 41,532 wagons (in four wheeler units). A review of the position of wagon holding vis-à-vis requirements in the zones disclosed as under:-

- Performance Audit on Freight and Wagon Management contained in C&AG's Report on Railways (Report No. 6 of 2007) disclosed that wagon manufacturers in the public sector were persistently defaulting on supplying the contracted wagons and IR was continuously repeating orders on these manufacturers. Effective remedial measures were still

not in place and the public sector wagon manufacturers were only supplying 1,739 to 2,713 wagons every year comprising 33 to 51 per cent of the contracted wagons. Similarly, analysis of data for period 2006-09 disclosed that private manufacturers were also supplying only 5,445 to 7,170 wagons comprising 43 to 51 per cent of the contracted wagons leading to a heavy carry over of requirements adversely affecting availability of wagons in the zones.

Further, the persistent carry over of requirements of wagons and locomotives contributed to continuous non-utilisation of funds, ranging from Rs.387 crore to Rs.1,864 crore comprising 12 to 31 per cent of the total grant (both from budgetary support and IR's internal generation) for augmentation of rolling stock during 2006-09.

- IR formulated an Integrated Railway Modernisation Plan (IRMP) for implementation over a five year period (2005-2010) to address, among others, the growing demands of traffic and to modernise the freight business segment. This included induction of corrosion resistant stainless steel body wagons and light weight aluminium wagons to minimise the adverse effect of corrosion and high abrasions due to mechanised loading/unloading. IR also envisaged introduction of self steering bogies to reduce stress on track and rolling stock. IR while finalising its annual Rolling Stock Programmes for augmentation of various types of wagons was only considering a very low scale of augmentation of these improvised wagons. The pace of augmentation at the end of four out of the five year plan period indicated that the objective of the plan was not achievable by the envisaged period as shown below. Some zones (NWR, SWR, NR and ECR) did not receive any of these specialised wagons.

Sl No.	Type of wagons/ bogies	No. envisaged in IRMP	No. provided at the end of March 2009
1	Corrosion resistant stainless steel wagons	10,000	278
2	Light weight aluminium wagons	2,000	922
3	Self steering bogies	Not mentioned	Nil

- IR introduced (2006-07) Wagon Investment Scheme (WIS) to cater to the increased demand for wagons by inviting private investment in acquisition of wagons. The benefits envisaged in terms of rebate in freight and an assured supply of a guaranteed number of rakes to investors did not serve as an incentive as in 13 out of the 16 zones, no investor came forward to invest in the scheme. Out of the other three zones (SER, ECoR and SWR), while 91 customers opted for the scheme in two zones (SER-60, ECoR-31) only 15 customers opted in SWR. IR replied that the induction of rakes under the scheme was confined to a single commodity and was restricted to a few iron ore loading points with an assured supply of rakes, which created enormous pressure to fulfill other commitments of moving programmed traffic. The scheme, therefore, was not effective in harnessing customers for various other commodities and was withdrawn from April 2008 and a new scheme

namely Liberalised Wagon Investment Scheme (LWIS) was launched which is yet to fully materialize in the zone.

Thus augmentation of locomotives did not keep pace with growth of traffic in the zones owing to persistent manufacturing constraints and setting up of manufacturing facilities under PPP initiative were still in nascent stages. The initiatives envisaged in the IRMP for augmentation of specialised wagons were only partially achieved. Imbalances in availability of rolling stock vis-à-vis the requirements existed in the zones, warranting improved management.

Recommendations

IR needs to expedite augmentation of rolling stock to ensure that the rolling stock infrastructure adequately caters to the projected growth in traffic. IR also needs to address, on priority, the imbalances in the availability of rolling stock vis-à-vis the requirements in the zones.

1.9.1.2 Freight terminals

Freight terminals comprise goods sheds owned by railways and sidings owned by private parties. Efficient movement of rolling stock is dependant on various facilities provided at these terminals to enable faster loading and unloading of rakes without much detention to ensure that available scarce resources are optimally utilised. Modernisation of freight terminals, leveraging Information



Broken concrete basement at Jagdalpur goods shed

Technology and augmentation of private participation are some of the initiatives taken up by IR for improving freight services. A review of the adequacy of facilities provided at 110 freight terminals handling more than 30 rakes a month on an average, modernisation and Information Technology initiatives disclosed the following:-

Facilities in freight terminals

Facilities in freight terminals comprise direct reception and dispatch facility; all weather cemented/ tarred approach roads etc to enable quicker placement and removal of rakes and facilities such as a covered shed, mechanical equipment and weighment to enhance the quality and pace of loading/unloading operations. IR also envisaged that terminals handling more than 30 rakes per month should have at least three lines for goods operations.



Partly covered shed at Pune goods shed

While planning the annual works programmes IR accorded priority to capacity enhancement works such as provision of new lines, gauge conversion and doubling works etc and terminal improvement works were planned to the extent of the remaining resources available. Allotment of funds towards Traffic facilities in the annual Budget Estimates also constituted barely 10 per cent of the allotment towards capital augmentation works, though the allotment increased from Rs.413.58 crore in 2005-06 to Rs.914.48 crore in 2007-08. Further, IR regularly surrendered about seven to nine percent of the allotment under Traffic facilities (ranging from Rs.41 crore to Rs.88 crore) during the three years 2005-08. As such, these basic amenities were not provided in a substantial number of terminals as shown below thereby adversely affecting placement, removal, loading/ unloading operations causing detention to rakes.

Sl No	Description of facility	Number of deficient terminals	Zones with deficiency in five or more terminals
1	2	3	4
Reception and placement facilities			
1	Separate engine escape line	47	CR , ECR
2	Direct reception /dispatch facility	48	CR, SER, SECR
3	Interlocking facility	62	SCR, CR, SER, WR, WCR
4	Track circuiting facility	80	CR, SER, WR, SECR, WCR, SCR, ER, NWR, ECoR,
5	Tarred approach road	39	CR, ECoR
6	Three lines for goods operations	23	ECoR
Loading and unloading facilities			
7	Fully covered shed	53	CR, SER, ECR, ECoR
8	Pucca circulating /handling area	44	CR, SER, ECoR, ECR
9	Lighting arrangement	23	CR
10	Loading and unloading equipment	41	CR, ECR
11	Weighment facility	56	CR, SR, ECR

In the absence of interlocking facility, the average time taken for manual operations for placement of rakes was one hour or more in 16 out of 59 terminals, of which in three terminals (Rourkela Steel Plant siding, OCL siding, Rajgangpur and JCP siding, Tatanagar) over SER, the average time taken was 18 hours, eight and a half hours and five hours respectively. In National Aluminium Company siding, Damanjodi in ECoR, though the siding authorities had deposited Rs.4.58 crore in phases with IR for undertaking interlocking and track circuiting works, IR did not commence any work till 2008-09 and insisted on an additional deposit of Rs.0.23 crore to commence work.. Similarly it was seen in ECR that due to non availability of direct reception lines in Raxaul and NarayanpurAnant goods sheds the rakes were first taken to the yard and then brought on to the goods shed for loading/unloading . In Raxaul, the rakes were being placed in the goods shed for loading only after 23 hours of its arrival in the yard.

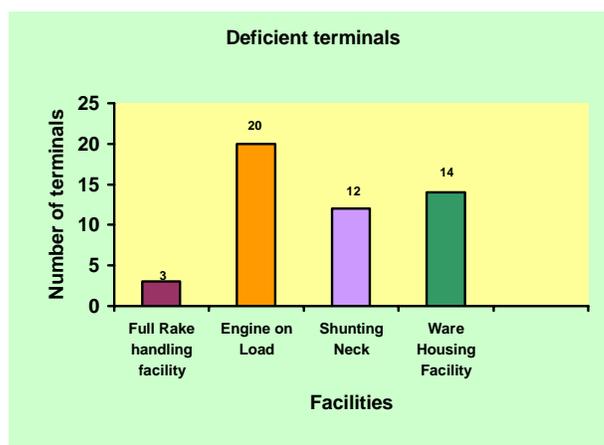
Further, absence of weighing facility at freight terminals exposed the system to the risk of overloading. It was seen in WR that goods trains were being detained for around two hours for weighment at the enroute electrical in motion Weigh Bridge at Viramgam alone. Though the number of trains detained at this facility has reduced from 3,000 trains in 2005-06, around 400 trains continue to get detained every year at Viramgam. The zone accepted that steps would be taken to further minimise this detention.

IR stated (March 2010) that 141 works costing Rs.831.60 crore were in progress for improvement/ upgradation/ provision of goods sheds and that upgradation of infrastructure was a continuous process. IR also stated that

development of reliable electronic in-motion weighbridge of the desired technical specification and the costs of 120 tonne weighbridges were the main reasons for slow proliferation. IR further added that instructions have now issued to all the zones for commissioning all planned/ proposed weighbridges quickly and as close to the loading points as possible.

However, a substantial number of terminals were not provided with even the basic facilities and IR needs to scale up its investment in traffic facilities. The management of resources also required improvement since the limited resources allocated for Traffic facilities was being persistently surrendered.

Modernisation of freight terminals



Recognising that most of the terminals on IR, other than the industrial sidings, suffered from inadequate infrastructure IR in its IRMP envisaged modernisation of freight terminals to provide quicker loading and unloading of rakes, improved turn around and customer satisfaction. Forty terminals were initially

selected for modernisation and the list was later revised to 55 terminals. A review of facilities provided in 22 such terminals identified for modernisation disclosed that even modernisation works at freight terminals were not being planned by the zones and mechanisation of freight operations received low priority and were not taken up. Therefore, the facilities envisaged were not provided in many terminals as shown below even though four out of the five year period for implementation had lapsed.

The poor condition of some terminals and the pace of progress of works in terminals identified for modernisation, it is unlikely that the objectives of the IRMP would be met by the envisaged period as shown below:

- Sanctioned works on nine terminals in seven zones¹ were either not taken up or were in the preliminary stages such as finalising cost estimates, evaluation and placement of tenders. In two zones, works taken up in six other terminals² were progressing very slowly.
- Though full rake loading facility was available in Cuttack goods shed in ECoR, which on an average handled 33 rakes every month, the shed was lacking in basic facilities. The shed only had two lines as against the stipulated three. Even in these two lines, only partly covered sheds were

¹ Ghaziabad and Chandigarh –NR, Korukkupet and Tiruchchirapalli –SR, Salvordam –SWR, Sanathnagar- SCR, Navlakhi Port- WR , Solapur –CR and Kalumna-SECR..

² Laxmibainagar, Dewas, Mangliagaon , Chirai, and Gandhidham –WR and New Mulund goods terminal –CR



Chipped platform shed - Cuttack goods shed

provided and therefore each time about half a rake (15 to 19 wagons) was placed in the open. Further, the platform shed on one line was chipped to raise the traction wire and as a sequel the platform was exposed to rain water making it unsuitable for stacking food grains and sugar consignments during rainy season.

IR mentioned (March 2010) that modernization of freight terminals was a continuous process and that a number of works were in progress for upgradation of facilities in freight terminals. However, Audit observed that the pace of progress of these works was slow and thereby the objectives envisaged in the IRMP were not likely to be achieved within the envisaged period.

Private participation

In order to encourage the terminal or siding owners to invest in modernisation of terminals so as to reduce terminal detention of wagons by using modern methods of loading/unloading, the Terminal Incentive cum Engine On Load Scheme was launched with suitable financial incentive to siding or terminal owners. IR also offered a financial incentive by way of rebate in freight. The engine on load facility was applicable only in terminals where mechanical loading takes place and it was observed that mechanical loading facilities were not provided in many major terminals as shown in para 7.2.1 above. Therefore, there were no takers for the scheme in 10 out of the 16 zones. In the remaining six zones, only 66 parties opted for the scheme of which 51 customers were from one zone (SWR). The scheme was subsequently withdrawn in January 2009 and the initiative of augmenting private investment

for modernising terminals remained unsuccessful. A majority 54 per cent of respondents also opined that existing policies of IR were not providing adequate incentive to attract investments for improving facilities in terminals.

IR mentioned (March 2010) that a draft policy was under consideration to throw open development of private freight terminals for handling all types of rail-borne traffic (except outward iron ore and coal) to third parties.

Thus even major freight terminals across IR that handle more than 30 rakes every month were deficient in basic facilities. Modernisation of terminals by enhancement of facilities has not been fully implemented by the zones in most of the terminals leading to heavy terminal detentions of rolling stock. The objective of reducing detentions due to loading and unloading operations below 16 hours has not been achieved. Freight Operations Information System in its present state was not serving as a decision making tool.

Detention to wagons

Detention to rolling stock in freight terminals occur from the arrival of rake to its placement for loading/unloading (arrival to placement time), during loading/unloading operations (placement to release time) and till its actual departure (release to dispatch time) from the terminal. Analysis of detention details of terminals handling more than 30 rakes per month across IR for the period 2007-09 indicated that 54 per cent of the detentions occurred from placement of rakes to their release, when the basic loading/unloading operations take place.

Though Railway Board had advised the zones to restrict detentions from placement of the rake to its release to less than 16 hours, analysis in four zones (CR, ER, SCR and SWR) disclosed that in 60 out of the 87 terminals the average detention from placement of the rake to its release continued to be beyond the stipulated 16 hours due to deficient facilities in the freight terminals. Consequently, demurrage leviable from private parties for detention of rolling stock in terminals beyond the allowed free time for loading/unloading operations, were routinely waived across zones. SWR, however, mentioned that detentions had come down to nine hours between November 2008 and March 2009. Rake wise detention test checked for a period of ten days in the selected 110 terminals across IR during April to June 2009 indicated that the trend of detentions continued in the zones. Some of the major detentions observed and their financial impact are enumerated below:

- Kanakpura goods shed of NWR handling 45 rakes per month was opened for traffic in August 1995 without basic facilities. As a result, 86.87 per cent (483 out of 556 rakes) and 93.18 per cent (328 out of 352 rakes) of rakes suffered detention during 2007-08 and 2008-09 respectively causing a loss of earning capacity of Rs.18.99 crore. IR mentioned that the goods shed was provided with a siding, loading/unloading area and circulating space. However, it was seen that the other reception, placement facilities and loading/unloading facilities were not provided leading to persistent detentions to rolling stock.

- The unloading line at Ennore Port Limited siding in SR was partially wired to suit unloading by poclairn cranes, which necessitated shunt moves for placement and removal of wagons. The consequential loss of Rs.9.19 crore due to detentions to wagons was not getting compensated as the siding was declared as an independent booking point.

IR accepted (March 2010) that the sudden jump in loading in the period under review resulted in shortages of locomotives and rolling stock and that currently the number of driving units in the system was substantially less than the number of rakes and thus detentions to rakes were unavoidable. Though IR claimed that by prioritizing facilities at terminals, detentions were reduced, Audit observed that the average detention from the placement of rake to their release continued to be beyond the envisaged time of 16 hours in a substantial number of terminals, indicating that the loading/unloading facilities were deficient in the freight terminals.

Leveraging Information Technology

Freight Operations Information System (FOIS) was developed by IR with a view to computerise freight operations and to provide a wide range of information to enable planning, direction and control of freight operations as well as to provide a real time view of transactions. IT Audit of FOIS was conducted across IR to assess the system design, reliability and timely availability of basic operating data, Information Systems controls and security environment. **The detailed findings are reported separately in Chapter 2.**

Broadly, it was seen that the system was largely being utilised to generate Railway Receipts. The system design was not comprehensive, the master data bases contained numerous errors and the system was not serving as a tool for decision making. Even though exhaustive details of demands of customers were captured to assess the load and to facilitate decisions on allotment of rakes using FOIS, decisions were taken manually defeating the very objective of capturing such exhaustive details.

Further, comparative analysis of manual data on detentions vis-à-vis the data reported through FOIS pertaining to nine terminals in SCR (whose details were only made available) indicated that the detentions details reported by FOIS were mostly understated and the extent of understatement ranged from 15 minutes to 32 hours, which indicated that the information was unreliable. Similarly, in ER, detention details were understated by FOIS ranging from 38 minutes to 57 hours in 21 out of 23 terminals.

IR in its reply (March 2010) stated that the discrepancies in reporting of detentions would be eliminated with full implementation of TMS along with control charting. IR also mentioned that zones were being advised to take appropriate measures to strengthen the internal checks.

Free time allowance

IR reduced the free time for loading/unloading from nine to seven hours at thermal sidings. The Committee constituted by Ministry of Power (June 2008) reviewed the infrastructure at 38 thermal power house sidings across IR and

concluded that the infrastructure was designed reckoning the free time as nine hours and therefore the reduction to seven hours was impracticable due to space and funding constraints. Unless IR initiates concerted action with the Ministries of Coal and Power, detentions of rolling stock beyond seven hours would continue to occur.

IR in its reply (March 2010) stated that the lower free time was prescribed to ensure faster release of wagons, which would correspondingly lead to greater availability of wagons for loading. However, since the Ministries of Coal and Power consider it impracticable with the current infrastructure, IR needs to initiate concerted action with these Ministries on priority for ensuring adherence to the prescribed free time allowance.

Feedback of terminal/siding owners

A majority of the 173 respondents to the survey of siding owners echoed similar sentiments as 52 per cent of them felt that mechanised loading/unloading facility was not available in terminals and that the free time allowed for loading was inadequate. 50 per cent of the respondents however expressed satisfaction over the approach roads, lighting, stacking area and the working hours at terminals. However, a significant 42 to 47 per cent of them felt that these facilities were inadequate.

Thus even major freight terminals across IR that handle more than 30 rakes every month were deficient in basic facilities. Modernisation of terminals by enhancement of facilities has not been fully implemented by the zones in most of the terminals leading to heavy terminal detentions of rolling stock. The objective of reducing detentions due to loading and unloading operations below 16 hours has not been achieved. Freight Operations Information System in its present state was not serving as a decision making tool.

Recommendations

IR needs to expeditiously provide the basic facilities in all freight terminals. IR should ensure that its initiative of modernisation of freight terminals is effectively implemented in the zones to minimise rolling stock detentions at freight terminals.

The system design and reliability of the Freight Operations Information System needs to be enhanced so that the IT application serves as a decision making tool as envisaged.

1.9.1.3 Capacity enhancement

IR projected freight traffic of 1,100 million tonnes by the terminal year of the XI plan (2011-2012). To handle the projected traffic volume, IR assessed that capacity augmentation and throughput enhancement works were essential and identified capacity augmentation and throughput enhancement works. IR also identified works for improving the rail connectivity with ports. Upgradation of the permanent way was planned to cater to the enhanced loading strategy. These works were over and above the works required to develop the Dedicated Freight Corridor. The overall annual outlay on capacity enhancement works ranged from Rs.4,365 crore in 2005-06 to Rs.8,650 crore in 2007-08.

The traffic density over IR indicated that the passenger trains outnumbered the freight trains. The increased number of passenger trains introduced every successive year contributed to congesting the available network and off-setting the capacity enhancement initiatives taken up annually. Notwithstanding the above, a review of these initiatives disclosed the following:-

Capacity augmentation works

IR identified the high density network routes across the railway network that included all the six Golden Quadrilateral routes (New Delhi- Mumbai- Chennai-Howrah) its diagonals and other feeder routes. IR evaluated that these routes comprise 28 per cent of the total route kilometers but accounted for 76 per cent of the total freight tonnage carried by IR. A total of 124 works were identified along these routes, which included gauge conversion, doubling, new lines, electrification on identified sections and automatic signaling works. A review of the progress of 38 works taken up in seven zones³ indicated that:

- Twelve works⁴ whose envisaged target date of completion ranged between November 2008 and December 2009 were delayed due to procedural delays in the pre tender finalisation stage and the physical progress of works taken up ranged from five to 70 per cent only.
- Another 16 works⁵ whose target date of completion ranged from August 2009 to June 2011 have not yet been taken up. Most of these works were still in the preliminary stages of the tendering process such as drawing up of estimates, finance vetting and opening of tenders. The pace at which these works were progressing makes it unlikely that they would be completed by the envisaged period.

IR replied (March 2010) that during the first two years of the XI five year plan 513 kilometers of new lines, 2,112 kilometers of gauge conversion and 789 kilometers of doubling have been completed. However, Audit observed that procedural delays in the preliminary stages of tendering were delaying the progress of a substantial number of works, which needs to be addressed.

Throughput enhancement and other works

A review of the works taken up for throughput enhancement and port connectivity and progress of the Dedicated Freight Corridor disclosed that:

- During the entire X plan period (2002-2007) IR could only add 945 kilometers of New Lines and 1,363 Track Doubling kilometers as against the envisaged 1,310 and 1,575 kilometers respectively. This translated into an average annual addition of 462 kilometers of which only 189 kilometers comprised New Lines, which was inadequate considering IR's scale of operations in terms of its network of route kilometers, freight tonnage and passengers carried.

³ SCR-8, NR-3, SER-3, ECoR-5, SECR-5, NFR-7, ECR-7.

⁴ SCR-1, ECoR-4, SECR-1, NFR-6.

⁵ SCR-2, NR-2, SER-3, SECR-1, NFR-1, ECR-7

- Out of the 86 throughput enhancement works identified by IR, the physical progress of 30 works which were planned for completion during 2009-10 and 2011-12 were less than 50 per cent. Of these, 10 works taken up during 1990-91 to 2003-04 were still in the land acquisition and earthwork stages and were progressing slowly. Seven other works were neither taken up nor their target dates determined.

IR replied (March 2010) that overall 30 out of the 86 works would be completed by the end of 2009-10. However, as pointed out by Audit above, physical progress of works planned for completion during 2009-10 and 2010-11 were progressing slowly and were behind schedule and therefore the pace of progress of these works needs to be quickened.

- The port connectivity works taken up in three zones (SCR, ECoR and SER) were progressing slowly as shown below.
 - Haridaspur-Paradeep new line in ECoR was sanctioned in 1996-97 and was due for completion in June 2010. However, after more than 12 years, physical progress of the work was only 14 per cent as land acquisitions were still in progress. Further, out of the estimated 136 minor and 27 major bridges, only construction of major bridges was in progress and others were not yet taken up.
 - In SCR, laying of new line between Obulavaripalli to Krishnapatnam port sanctioned in 2007-08 with targeted completion in 2014 under phase I and the doubling work Samalkot and Kakinada port has been completed. The electrification work was still incomplete due to the zone's failure to include the work of a small patch of four kilometers from Kakinada port to New Block cabin in the original estimate. The material modification in the scope of work was pending sanction in Railway Board March 2010.
 - Similarly, in the 69.60 kilometer Panskura – Haldia port section in SER, the doubling work from Panskura to Rajgoda has been completed but the portion between Rajgoda to Tumluk remains to be completed and thus the planned port connectivity could not be achieved.
- The Dedicated Freight Corridor Corporation of India - a Special Purpose Vehicle - was set up in October 2006 to undertake planning and development, mobilisation of financial resources and construction, maintenance and operation of the proposed western and eastern corridors from Jawaharlal Nehru Port to Dadri (1483 kilometers) and Ludhiana to Dankuni (1806 kilometers) respectively. The project was at a very primitive stage. IR replied (March 2010) that the process of land acquisition was being closely monitored and funding tie ups with bilateral/multilateral funding agencies were at advanced stage and the loan agreement for the western corridor phase-I was expected to be signed in March 2010. The project cost initially estimated at 28,000

crore (January 2007) has almost doubled and is estimated at Rs.48,000 crore at present costs.

Permanent way

After enhanced loading was permitted on several routes, the permanent way (railway track) required strengthening to bear the heavier loads. The sections with 90R rails and/or steel trough sleepers were being identified in the zones and upgraded every year with 60 kilogram rails and PSC sleepers with a density of 1,660 sleepers per kilometer. However it was seen that even on routes identified for enhanced loading, in some zones (NCR and SWR) upgradation works on 115.54⁶ kilometers were not taken up and in some others (NR, ER and NWR) the works taken up on 505.09 out of the planned 950.10 kilometers⁷ were progressing slowly due to operational constraints such as non-availability of the sections and locomotives for testing the track. Similarly, while works of upgrading the sleeper density were not taken up in one zone (NCR) in some others (NR, NWR and SWR) works taken up on 558.20 out of 1,110 kilometers were progressing slowly.

Thus the progress of capacity augmentation, throughput enhancement, port connectivity works and upgradation of permanent way was behind schedule. Infrastructure augmentation was not commensurate with the projected growth in freight traffic and IR had a huge throw forward of 408 projects costing Rs.1,41,015 crore (including the Dedicated Freight Corridor) as at the end of March 2009.

Recommendation

IR needs to expedite the capacity augmentation, throughput enhancement and port connectivity works to ensure that the infrastructure is commensurate with the projected traffic volume. IR needs to effectively monitor and curtail procedural delays in works contracts.

1.9.2 Utilisation and maintenance of available assets

IR's phenomenal growth in freight loading in the recent past was due to efficient asset utilisation apart from adoption of market responsive strategies. The earlier performance audit on Freight and Wagon Management⁸ and the multi disciplinary core committees constituted in the zones to oversee the impact of enhanced loading of wagons on some vital components of rolling stock and permanent way (railway track) provided ample evidence that the existing infrastructure was in fact over stretched. A test check of the current quarterly statistics continued to indicate that the wear and tear on rolling stock had increased manifolds as shown below:

⁶ NCR-99.49, SWR(Bangalore Division) 16.05

⁷ NR-232.90, ER- 95.87 and NWR-176.32 out of planned 541.92, 109.50 and 298.68 kms respectively.

⁸ Chapter I of Report No 6 of 2007 of the Comptroller and Auditor General of India (Union Government Railways).

Parameter	Pre enhanced loading period Quarterly average of 2004-05	Post enhanced loading period Quarterly average of 2008-09
1	2	3
CBC and Draft Gears	158	760
Spring Defects	128	334
Stalling cases	15	37
Wagon Body defects	901	3547
Arisings in unloadables*		
A Category Repairs	602	1735
B category Repairs	460	1406
C Category Repairs	64	312

* Wagons forming part of rake damaged during loading /unloading & are unfit for loading

The wear and tear on permanent way in terms of defects in track structure viz., rail fractures and weld failures had also increased significantly. The initiative of enhanced loading is, therefore, not sustainable in the long term unless it is accompanied by augmentation of assets and infrastructure.

IR in reply (March 2010) stated that due to heavy inputs given to track maintenance, rail fractures and weld failures have not increased significantly and that wear and tear on rakes was on the higher side, which was being controlled by providing additional springs to enable the rolling stock to carry heavy loads. However, current statistics continued to indicate that wear and tear on rolling stock continued to be perceptibly higher and there was no improvement in the defects to the track structure.

Further, viewed from the customer's perspective, efficient utilisation of assets should ultimately translate into efficient and effective delivery of freight services, which implies provision of a reliable and timely service. In the endeavour, it is also imperative that assets are efficiently maintained to enable optimum utilisation. A review coupled with the customer perception obtained by Audit through a survey of siding owners indicated inadequacy in supply of rakes to customers, inefficiencies in enroute stabling of rakes, interchange commitments and maintenance of rolling stock that affected the efficiency of freight services as brought out below.

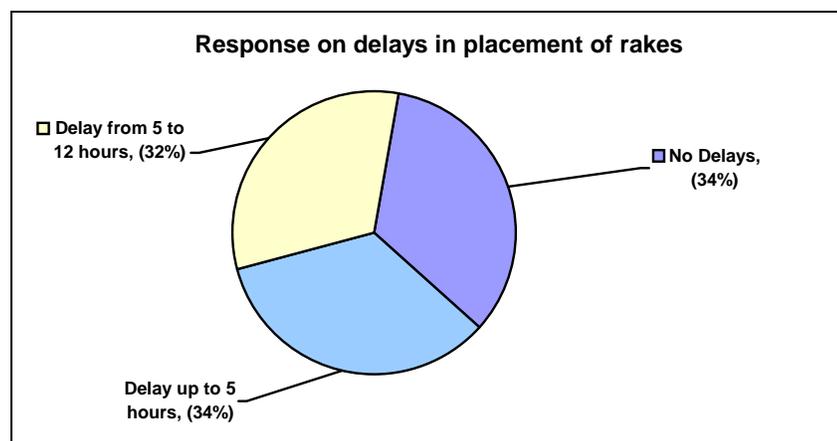
1.9.2.1 Utilisation of assets

Effective utilisation of assets calls for supply of rakes to customers as per demand and delivery of consignments at the destination minimising the enroute detentions to rolling stock. Enroute detention to rolling stock occurs either when the rakes are stabled or when the interchange commitments between zones and other operational agreements are not efficiently regulated. A review disclosed the following:-

Supply of rakes

Effectiveness of supply of rakes to customers assessed by the feedback received from terminal/siding owners indicated that:-

- Though a substantial 66 per cent of the respondents to the survey felt that information on availability of rakes were provided by IR, 52 per cent felt that on most occasions the rakes were not placed in the terminals for loading at the time preferred by customers. The respondents also felt that rakes were placed belatedly as shown below.



Forty eight per cent of the respondents, however, expressed satisfaction on the quality of rakes supplied, while another 55 per cent felt that rakes were moved by IR within a reasonable time after completion of loading.

IR in its reply (March 2010) conceded that IR would have to maintain extra cushion in rolling stock to ensure timely supply of rakes to customers and that at present there was a shortage of rolling stock. IR, however, added that maintenance practices were rationalised to reduce the ineffective time of the wagon fleet.

Some of the zonal initiatives for managing the supply of rakes to customers indicated that:

- Due to improper planning, WR continuously supplied 10,423 wagons in excess of demand to Mundra Port and Special Economic Zone Limited during the period September 2007 to March 2009, which were detained for 4,651.52 wagon days. As per the terms of the agreement, wagon hiring charges for such detention of wagons supplied in excess of demand was also not recoverable from Mundra Port and Special Economic Zone Limited and WR was losing out.
- Conversely, SCR carried bagged consignments of cement from five cement sidings in open wagons instead of in the normal covered wagons during 2006-07 to 2008-09 by offering concession in freight, which enabled the zone to earn revenue of Rs.88.06 crore.

Stabling of rakes

Rakes get stabled at various locations due to inadequate powering, non availability of path and inefficient management of crew adversely affecting freight operations. A test check of the extent of stabling of rakes in 32 out of the 68 divisions over IR revealed that:

- A substantial 15 percent of 4,32,634 rakes and 2,79,110 rakes booked during 2007-08 and 2008-09 respectively had to be stabled enroute on account of inadequate powering and non-availability of path. The average detention to rakes on account of in-adequate powering ranged from 2.19 to 17 hours during 2007-08 in six zones (CR, ECoR, NCR, SECR, SER and SWR), which marginally improved and ranged from 2.62 to 15 hours in 2008-09.
- Enroute stabling of rakes occurred even in zones which had adequate locomotives, due to inefficient management of locomotives. Out of 21,023 rakes that were stabled in 2008-09 due to inadequate powering, WCR alone accounted for 12,214 rakes, while three zones (NR, NCR and NWR) accounted for 6,116 rakes.
- Though the overall stabling of rakes for want of crew was not significant, NCR alone accounted for 68 and 72 per cent of the stabling cases during 2007-08 and 2008-09 respectively, indicating that the crew management in the zone was not efficient.

Interchange commitments and other agreements

Interchange commitments are commitments entered into on a day to day basis between contiguous zones for provision of a specified number of wagons/rakes at interchange points (where one zone hands over the rakes to the other zone). The interchange commitments between zones are vital for smooth and efficient operation of freight services, since freight trains transverse across zones to different destinations. The interchange commitments between the zones at selected interchange points were reviewed and disclosed that:-

- Shortfall in provision of the required number of rakes vis-à-vis the commitments was noticed in six (ECoR-21.09, NFR-16.34, NWR-8.32, SR-13.07, SER-1.53 and SECR-7.72 per cent) out of the 10 zones. Details of commitments made by the other six zones (ER, NR, SCR, WR, CR and NER) were not made available. Average detention to rakes at the selected interchange points ranged from three to 276 hours. Out of these, in three zones (ECoR, NCR and SWR) detentions to rakes were regularly in the range of 32 to 41 hours, which was substantial and required attention. Failure to meet the interchange commitments was mainly due to non-availability of path and precedence accorded to coaching trains, which warranted enhancement and/or decongestion of the route network.

IR stated (March 2010) that passenger trains have substantially higher speeds than freight trains. In the existing operating system, it was inevitable to detain freight trains to give precedence to passenger trains due to their importance and speed differentials of the rolling stock. This reinforces the need to accord priority to enhance and/or decongest the route network.

- The agreement between WR and Kutch Railway Company Limited was not being efficiently managed. Periodic traffic plans estimating freight

traffic to be moved by rail on Kutch Rail project, though envisaged in the agreement, were not being prepared. As such, in Mundra Port Trust siding alone, WR lost 33,216 wagon days between July 2008 and March 2009, due to detention of rakes for want of power. The zone maintained that consolidated power plan was only prepared and that a separate power plan for Kutch Rail was not prepared.

IR in its reply (March 2010) has stated that power allotments are made on a day-to-day basis prioritizing areas that give maximum returns. The fact, however, remained that in the absence of traffic plans estimating freight traffic movement as envisaged in the agreement, detention of rakes for want of power could not be contained.

Thus inefficient supply of rakes to customers, frequent stabling of rakes and inefficient interchange commitments between zones mainly due to congestion of path were leading to heavy enroute detention of rakes, which was adversely affecting efficient delivery of freight services.

Recommendations

IR needs to ensure adequate availability of power to haul the freight train, besides curtailing stabling of rakes enroute and improve the interchange commitments between zones to minimise enroute detentions and to enhance the efficiency of freight services.

1.9.2.2 Maintenance of assets

To ensure regular availability, enhance reliability and productivity of locomotives and wagons, efficient maintenance is essential in sheds and workshops respectively. Preventive maintenance is carried out in IR through periodic overhauls. Efficient periodical maintenance of locomotives and wagons reduces the incidence of unscheduled maintenance. Under the existing scenario where the assets are already strained, scheduled maintenance was imperative. The quality of maintenance was reviewed and findings are brought out below.

Locomotive maintenance

Railway Board had advised zones to keep the movement of dead locomotives (locos that have failed) to the minimum. A review of the maintenance of locomotives in the selected divisions indicated that:

- Under the existing mechanism locomotives failing enroute in a run are brought to its home shed for repairs irrespective of the nature of repairs. Such movement of dead locomotives from the location of failure to the home shed, even for minor repairs, instead of to the nearest available shed results in extra expenditure on haulage apart from the loco being out of service for a longer period. During the period 2007-09, 463 electric locomotives and 876 diesel locomotives, which failed enroute in 27 divisions, were hauled back as dead to home sheds involving avoidable haulage of 6,81,098 kilometers. Of these, only 124 diesel locomotives pertaining to eight zones⁹ had come for major repairs.

⁹ ECoR-38, WR-42, NFR-2, NER-1, SER-11, SCR-11, SWR-6 and CR-13

- A test check of the quality of maintenance of locomotives in 42 diesel and electric locomotive sheds in 28 divisions for the years 2007-09, disclosed that several locomotives failed on account of poor workmanship in the sheds as tabulated below. Locomotives were also increasingly failing within a short span of six months of the periodic overhaul (POH), aggravating the shortage of locomotives in the zones.

Year	Traction	Locos on line (Nos)	Number of locos failing due to		Nos. of locos given premature POH	Locos failing with in short span of POH
			Bad workmanship	System failure		
1	2	3	5	6	7	8
2007-08	Diesel	3156	803	148	15	264
2007-08	Electric	2716	618	59	26	137
2008-09	Diesel	2927	683	71	7	136
2008-09	Electric	2606	699	46	26	122

Further locomotives were detained in workshops for want of spares. Nine locomotives were detained for periods ranging from 53 to 233 days in Krishnarajpuram Diesel Shed in SWR for want of power pack. The total detention, after allowing for seven days towards each replacement of power pack worked out to 1,386 days resulting in potential productivity loss of Rs.13.77 crore.

IR in its reply (March 2010) accepted failures of locomotives on account of poor workmanship in sheds/workshops and mentioned that the shortcomings in maintenance due to these failures were taken care of. The fact, however, remained that the quality of maintenance of locomotives in sheds required improvement especially in a scenario where locomotives are already in short supply and failures due to bad workmanship and equipment failures would aggravate the shortage further.

Maintenance of wagons

Primary maintenance of wagons is carried out in the wagon maintenance depots. Train examination (TXR examination) in wagon maintenance depots is periodically carried out to assess the condition of wagons and the TXR examination in freight terminals certifies the fitness of wagons for the next run. Analysis of records maintained in 53 wagon maintenance depots in 38 divisions and in 80 freight terminals across IR disclosed that:

- Out of the 9,632 wagons that were found defective with in a short span of their periodical overhaul during 2007-08 and 2008-09, 6,341 belonged to three zones (ECoR-2,818, SCR-2,312 and SR-1,211), indicating that the quality of maintenance in these zones required improvement.
- Railway Board advised (June 2008) the zones to bring down the total detention of freight trains for examination (from its arrival to its departure after TXR examination) from the IR's average of 14 hours (of which placement of trains for examination, the TXR examination and departure after examination accounted for 23 per cent, 32 per cent and

45 per cent of detention time respectively) to 11 hours. A test check of 53 wagon maintenance depots disclosed that in many depots the detention continued to be beyond the envisaged norm as shown below.

Year	No of depots where average arrival to placement time was beyond 2 ½ hours (23 per cent of 11 hours)	No of depots where average TXR examination time was beyond 3½ hours (32 per cent of 11 hours)	No of depots where average departure time after TXR check was beyond 5 hours (45 per cent of 11 hours)
2007-08	16	24	25
2008-09	34	23	23

While the delays in placement of trains for examination was mainly on account of lack of information on arrival of trains, inadequate infrastructure and operational delays, the TXR examination was primarily delayed in the depots due to inadequate manpower and deficient infrastructure leading to undue detention of rolling stock.

- TXR facilities were not available in 58 out of the 80 terminals selected. In the absence of TXR facility at the terminals /sidings, the rakes had to be hauled to the nominated depots located at the distance ranging from 1 to 400 kms. On CR and SECR alone, TXR facility was not available on 21 out of the 30 terminals booking traffic. Consequently, several rakes had to be hauled to a distance of 70 to 400 kms for TXR examination leading to detention of rakes for which incidentally no record was available with the Railway Administration.
- Further in SWR, due to deficient supervision the private agencies engaged by the consignors of iron ore for loading /unloading operations were extensively damaging the railway wagons due to reckless operations. Consequently, the damaged wagons (one to 30 wagons in a rake) were hauled in empty condition often for three to four trips before the rake returned to depot for primary maintenance and no deterrence mechanism was in place in the zone.

The supervisory mechanism in freight terminals warranted review across zones since the defective wagon arising was showing an increasing trend. While 16,345 wagons out of 61,009 rakes were found defective in TXR examination in 2007-08, 18,375 wagons were found defective in 51,598 rakes booked during 2008-09 from the selected terminals.

Thus the quality of periodic maintenance in locomotive sheds was poor and warranted improvement. TXR examination in wagon maintenance depots continued to be beyond the envisage norm due to manpower and operational constraints apart from deficient infrastructure. Further non availability of TXR examination in all freight terminals was leading to avoidable haulage of rakes. Supervision of loading and unloading operations by private parties in freight terminals was also deficient in the zones.

IR in its reply (March 2010) contended that wagon ineffective percentage was around 2.7 per cent for the current year, which was below the laid down target of four per cent. IR's contention is not tenable as in 59 wagon maintenance

depots test checked by Audit in 38 divisions, IR failed to bring down the detention of freight trains for examination (from its arrival to its departure after TXR examination) to the stipulated 11 hours.

Recommendations

IR needs to enhance the quality of locomotive maintenance and address the infrastructural and operational constraints to strengthen the TXR examination at wagon maintenance depots. IR should provide TXR facility at all freight terminals to prevent avoidable empty haulage of rakes. IR should strengthen its supervisory mechanism over loading /unloading operations by private parties and institute effective deterrence on defaulting parties.

1.9.2.3 Performance parameters

Various performance parameters are a vital index to judge the performance of IR in the various facets of freight operations. Indices such as Net Tonne Kilometerage per engine hour and per wagon day, wagon kilometers per wagon day and wagon turn round have improved in most of the zones, indicating better asset utilisation. The reported wagon turn round statistics were, however, unreliable. Even though most of the zones reported wagon turn round ranging from 1.37 to 3.6 days in 2007-08, the All India Average stood at 5.23 days. Further the following indices registered a decline in some zones as shown below.

- The hours worked per day per engine in use is an index that indicates the per day utilisation of a locomotive in use. While the per day utilisation of locomotives was in excess of 20 hours in some zones, in many others (diesel-SR, ECoR, SER and WR, Electric- ECR, ECoR, SR, SCR, SWR, WR and SECR) the utilisation ranged from 13 to 17 hours only, indicating that locomotive utilisation in these zones required improvement.
- Similarly, the engine kilometers per day per engine in use on diesel traction declined in 2008-09 in five zones (SR, NWR, SWR, WCR and CR) when compared to 2004-05. On SECR, SWR and SR the decline was 19, 27 and 39 per cent respectively. A similar trend was seen on electric traction in three zones (SR, CR and SECR).
- In spite of various capacity augmentation works under over IR, the average speed of freight trains did not show any perceptible increase. The average speed rose from 23.8 kilometers per hour in 2004-05 to 25.4 kilometers per hour in 2008-09 as against the maximum permissible speed of 60 kilometers per hour, which hampered efficient delivery and adversely affected their turn around.

IR accepted (March 2010) that traffic increased substantially in the zones without substantial commissioning of major throughput works and resultantly inefficiencies crept into running of trains due to which utilisation declined and speed did not substantially improve.

Recommendation

IR needs to review and improve maintenance and utilisation of locomotives and wagons, which would reflect on the performance parameters.

1.9.3 Improvement of freight market share

The freight market share of IR is driven by seasonality of demand. During the traditional busy season, the demand for movement of traffic peaks sharply putting considerable stress on the existing infrastructure. On the other hand, during the lean season, the demand falls sharply resulting in under utilisation of transport capacity. IR recognised that for some commodities such as iron ore and other minerals where it provides door to door service, IR had a competitive edge over other modes of transport. However, for other commodities, especially that of finished goods, which are transported either from siding to stations or from station to station, IR was losing out to road. IR had launched various freight incentive schemes to improve the market share and planned development of multi modal parks and other schemes to capture the road traffic. A review of these initiatives disclosed that these initiatives were either not evaluated or not implemented at all. This apart, zones were unable to achieve the loading potential as shown below.

1.9.3.1 Freight incentive schemes

The overall objective of the schemes was to enhance IR’s revenue though they were also intended to project a customer sensitive image make over of IR. The schemes introduced in 2006 were broadly divided into three categories:-

S. No.	Freight Incentive Schemes	Brief description
1	Volume Growth Incentive Schemes	Aimed at promoting higher rail share of the existing users traffic
2	Cargo Aggregation Schemes	Aimed at capturing traffic not amenable to bulk movement in block rake. IR offers aggregation of cargo through warehousing facility
3	Consignment volume based schemes	Transportation options differentiated by volume of consignment booked to a single destination or two or multiple destinations

A review of performance of the schemes introduced revealed the following:-

- The freight schemes were operating sporadically in some zones and some schemes such as incentive scheme for rail co-efficient (a volume growth incentive scheme) was not operational in any of the 16 zones. Amongst the cargo aggregation schemes, the ‘Freight Forwarder’ scheme was in operation in NR only, while the ‘Two Leg’ scheme was in operation on NR and NFR only. The marketing strategy of IR aimed at capturing piece meal traffic was, therefore, only partially achieved.
- Neither was the scheme wise data maintained nor was the incremental loading on account of the various freight incentive schemes monitored by the zones. IR has maintained that its marketing efforts translated into freight incentive schemes and contributed to the average annual increase in freight loading. However, in the absence of scheme wise data the

extent of patronage and the effectiveness of the individual schemes were not verifiable.

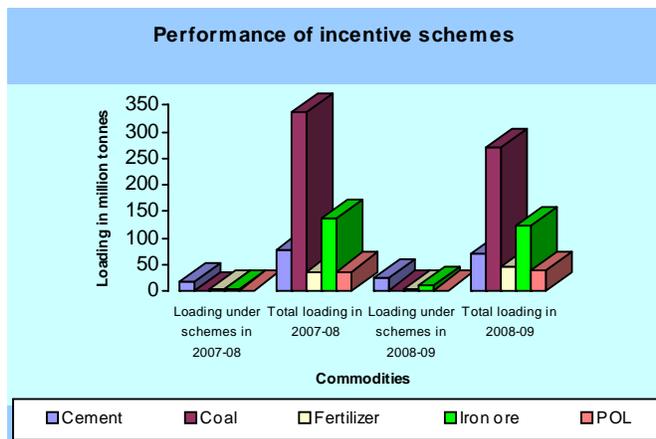
- The overall freight traffic booked under the various freight incentive schemes was 22.79, 38.41 and 46.34 million tonnes, which constituted only 3.02, 4.59 and 6.55 per cent respectively of the total traffic carried during 2006-07, 2007-08 and 2008-09. The commodity wise loading under freight incentive schemes vis-à-vis the total loading achieved for the commodity during 2007-08 and 2008-09 indicated that loading under the freight incentive schemes contributed to less than 10 per cent for all commodities except cement where the freight incentive schemes contributed to 23 to 33 per cent. Further, the overall annual growth of 8.1 per cent in physical loading was more or less corresponding to the average annual Gross Domestic Product growth of eight to nine per cent during the aforesaid period. Thus the incentive schemes at best contributed to retention of IR's market share and were not successful in improving the market share.
- Instances have also come to notice (NWR) where the customers misused the schemes by changing their names in the agreement with railways and misinterpreting the Board's orders. Further, the 'Two Leg' scheme allows 15 days' time for loading of goods in the second leg which was on the higher side considering that average wagon turnaround of IR was about six days.

IR mentioned (March 2010) that zones were directed to give wide publicity of the freight incentive schemes and to provide regular feedback so that the schemes could be modified periodically and that comprehensive guidelines were again issued in January 2010. IR also contended that its marketing strategy was not aimed at capturing piecemeal traffic since that role could be discharged more effectively and efficiently by container train operators.

IR's contention was not tenable as recapturing of piecemeal traffic, through aggregation of container and wagon load traffic to be moved in rake loads was one of its stated marketing strategy of the 10th Five Year Plan of IR.

1.9.3.2 Other marketing initiatives

To attract road traffic IR planned to develop multi modal parks under a Public Private Partnership initiative for aggregation of freight for onward transport by road. IR also envisaged development of Roll – On-Roll-Off (RoRo) door to door service to provide the facility of



transporting trucks loaded on a train to provide door to door multi modal service with greater customer satisfaction. These initiatives envisaged in 2005 have still not materialised. Respondents to the survey felt that apart from providing door to door service, transporting by road provided greater operational flexibility, lesser intermittent handling and consequential damages. Majority of the respondents, however, expressed concern over the pilferage of cargo enroute and IR's efficiency in settling their claims, implying that IR would have to address these issues as well to effectively capture road traffic.

IR mentioned (March 2010) that the initiatives such as Special Freight Train Scheme, Automobile Hub, Kisan Vision Project for attracting investments in PPP mode for logistics parks and in wagons were still in the policy formulation stage.

1.9.3.3 Loading targets and loading potential

A review of the freight loading achieved by zones vis-à-vis the targets fixed by Railway Board and the loading potential available disclosed shortfalls in achievement of targets and loading potential in some zones as shown below.

- Shortfall in achieving the loading targets was observed in eight out of the 16 zones in one or more commodities as tabulated below.

Commodity	Year	Per cent shortfall w.r.t. targets (average)	Zones in which the loadings fell short of the targets
1	2	3	4
Coal	2006-07, 2007-08	9.03	SER, ER
Cement	2006-07 to 2008-09	8.06	SCR, WCR, ER
Fertiliser	2007-08, 2008-09	6.57	SR, SWR, WCR, NFR
Food Grains	2005-06 to 2007-08	20.52	NR, NFR, ER
Iron Ore	2005-06 and 2008-09	14.96	SCR, SWR, ECoR
Pig Iron & Steel	2008-09	9.65	SER, SWR, ER

- An analysis of the freight loading achieved by the zones during the years 2006-07 to 2008-09 vis-à-vis the loading potential available based on the number of wagons available and wagon turn round revealed that the loading potential was not fully utilised in some zones (CR, NR, SCR, SER, SR and WCR). The under utilisation ranged from 18 per cent in SR to 44 per cent in CR.

Thus the performance of freight incentive schemes was not assessed and the marketing strategy to improve the market share of piece-meal traffic was not fully achieved considering that the overall growth in freight loading corresponded with the growth in GDP. IR's initiatives of capturing the road traffic through development of multi modal parks, Roll on Roll off schemes have not yet materialised though four years have lapsed since it was envisaged. Zones were not able to achieve loading targets and were not fully utilising the loading potential available.

Recommendations

IR should evaluate the incremental loading derived from incentive schemes and modify the schemes suitably to enhance the freight market share.

IR needs to expedite all the Public Private Partnership projects to effectively harness private investment. The other initiatives aimed at capturing the road traffic also needs to be quickened. Alternatively, IR should explore other means of capturing such traffic in the short and medium term.

IR needs to monitor the loading potential available in the zones and ensure that they are optimally utilised.