

EXECUTIVE SUMMARY**Chapter 1 Assessment, Procurement and Utilization of Locomotives in Indian Railways**

Using the fleet of 11,764 locomotives (locos), Indian Railways operated 13,452 passengers and 9,141 goods trains daily throughout its network of 68,442 Route Kilometers (RKM) as on 31 March 2018. Indian Railways has four loco production units, viz. Diesel Locomotive Works (DLW) at Varanasi, Chittaranjan Locomotive Works (CLW) at Chittaranjan, Diesel Modernization Works (DMW) at Patiala and Electric Loco Assembly and Ancillary Unit (ELAAU) at Dankuni. DLW and DMW were diesel loco production units. However, DLW and DMW started manufacturing electric locos from 2016-17 and 2018-19 respectively.

The main focus of the Performance Audit was (i) Production planning of locos *vis-à-vis* assessed requirement; (ii) Allotment of locos to Zonal Railways and adequacy of infrastructure to handle the available locos; and (iii) Efficiency of loco utilization.

Major Audit Findings

➤ Loco requirement was decided not on the basis of actual requirement, but for utilising the production capacity. Further, the main criteria adopted by Railway Board for the assessment of requirement of locos and production planning were actual production of locos in previous years. Factors, which should be an integral part of finalising loco requirements, were not wholly considered. More so, there was no structured methodology for assessing the requirements of locos based on specifically laid down parameters. This has led to more numbers of diesel locos in the system than required, as evident from the various efficiency indices of loco utilisation. **Para 1.8**

➤ Huge expenditure was incurred for capacity augmentation of DLW for production of diesel locos and the work was completed within five months from the targeted date of completion. On the other hand, works for augmentation of capacity of CLW and ELAAU for production of electric locos were running way behind schedule. **Para 1.11**

- Locomotives were allotted to Zonal Railways without keeping in mind their requirements and infrastructure available for maintenance, which led to underutilisation of locomotives by Zonal Railways. Further, newly allotted locomotives were commissioned after delays and could not be put in use after their receipt.

Para 1.12

- On account of defective material in manufacturing *etc.*, 46 per cent new locomotives failed within 100 days of their commissioning.

Para 1.13 a

- There were wide variations in sanctioned strengths of locomotive pilots per locomotive among Zonal Railways. There was no uniformity in locomotive pilots sanctioned and actual working requirements among Zonal Railways. No norms were fixed for number of locomotive pilots per locomotive.

Para 1.15

- Total 2,070 locomotives were added in Indian Railway's locomotive fleet during 2012-18. As compared to 2012-13, NTKMs¹ per goods engine per day 'on line' and 'in use' decreased by 11.6 per cent and 22.4 per cent respectively for diesel locomotives in 2017-18. Similarly, for electric locomotives, NTKMs per goods engine per day 'on line' and 'in use' decreased by 17 per cent and 27.2 per cent respectively.

Para 1.16

- Excess days were taken in periodical overhauling (POH) of diesel and electric locomotives in workshops, and completing their maintenance schedules in locomotive sheds. Locomotives were detained in exchange yards before and after their POH.

Para 1.17

- Lack of quality control, use of inferior material, poor supervision and inadequate internal control occurred during scheduled maintenance of locomotives in locomotive sheds. This led to unscheduled/ out of course repairs of 17,530 diesel and 22,078 electric locomotives.

Para 1.18 a

- On account of defective material, poor inspection *etc.*, 37 and 18 per cent diesel and electric locomotives failed within 180 days of their POH. Almost half of

¹NTKM - Net Tonne Kilometer – Unit of measure of freight traffic which represent the transport of one tonne goods (including the weight of any packing but excluding the weight of the vehicle used for transport) over a distance of one kilometer.

diesel and electric locos failed after their scheduled maintenance by loco sheds.

Para 1.18 b

Recommendations

- 1. Railways may evolve a suitable methodology for assessing the electric loco requirements, with due considerations to the end user requirements.**
- 2. Railways need to examine the referred augmentation works in the electric loco sheds to avoid the delays/ detention in maintenance of locos.**
- 3. Railways need to revisit upgradation of the infrastructure of existing diesel loco sheds judiciously taking into account the ongoing growth of electric loco fleet.**
- 4. Railways should improve infrastructure facilities, quality of maintenance and promote good management practices in loco sheds to minimize unscheduled repairs in future.**

Chapter 2: Production and Maintenance of LHB Coaches in Indian Railways

In 2002, Indian Railways entered into Transfer of Technology (ToT) contract with M/s ALSTOM LHB/Germany for production of LHB design stainless steel coaches. LHB design coaches are far superior with respect to passenger comfort, safety, speed, corrosion, maintenance and aesthetics than ICF design coaches (conventional coaches). These coaches are also longer as compared to ICF design and have more carrying capacity. Further, LHB coach has vertically interlocked Centre Buffer Couplers with anti-climbing features. This prevents the coaches to capsize in case of a derailment. The first LHB coach was introduced in Indian Railways network in December 2003. Audit analyzed the pace of production of LHB coaches, running of passenger trains with LHB coaches and extent of availability of maintenance facility for LHB coaches in IR.

Major Audit Findings

- In February 2012, High Level Safety Review Committee recommended complete switching over to the manufacture of LHB design coaches and

immediate stopping of the manufacture of ICF design coaches. However, the decision to switch over to LHB coaches was taken only with effect from 1 April 2018. During the last five years, out of 19,327 coaches produced by Indian Railways' production units, only 5,847 coaches were of LHB type i.e. only 30 *per cent*.

Para 2.2

- Indian Railways has three coach production units viz., Integral Coach Factory Perambur (ICF), Rail Coach Factory Kapurthala (RCF), Modern Coach Factory Raebareli (MCF). ICF and RCF manufacture both conventional and LHB coaches and MCF was set up in April 2011 to produce LHB coaches only. Railways also planned to set up new production units of LHB coaches at Kanchrapara and Singur. But, these were not yet functional.

MCF was set up only for production of LHB coaches. However, it was yet to fully contribute towards production of LHB coaches. During 2013-18, only 37 *per cent* of the installed capacity was utilized. Audit noted non-commissioning/ rejection/ breakdown of machines as one of the main reasons for shortfall in production by MCF. Railways need to enhance the installed capacity of ICF, RCF and MCF for production of LHB coaches and phase out production of ICF Coaches.

Para 2.3 and Para 2.3.1

- Audit examined planning and pace of conversion of ICF rakes into LHB rakes. During the last three years (2015-16 to 2017-18), 195 rakes were planned for conversion into LHB rakes. However, only 108 rakes could be converted into LHB rakes. Audit noted that Railway Board did not allot required number of LHB coaches to Zonal Railways and allotted coaches in piecemeal. Coaches received in the Zonal Railways were found lying unused till appropriate number of coaches were allotted to form a rake.

Audit also carried out age analysis of existing conventional coaches across Indian Railways. Out of 49,033 ICF design coaches, 609 coaches have already attained their codal life of 25 years as on 31 March 2018. Further, about 13 *per cent* (6,259 coaches) were between the age of 20 and 25 years and would need to be replaced in the next five years. As such, Indian Railways need to replace at least 6,868 coaches (14 *per cent*) over a period of next five years. In addition, Indian Railways would also need to manufacture additional new

coaches to cater to anticipated increase in passenger traffic. The present production programme was not able to meet the requirement of coach production.

Para 2.3.2

- Audit examined records of 53 major coaching depots to analyse the adequacy of maintenance of LHB coaches. Audit noticed lack of adequate infrastructure required for maintenance of LHB coaches in 14 depots. Spare items for maintenance of LHB coaches were not being properly maintained in 12 depots. Audit also reviewed the status of availability of infrastructure in workshops to analyse whether these were adequately equipped for POH/IOH and other maintenance activities of LHB coaches. Indian Railways did not have adequate facilities in their workshops for POH/IOH of LHB coaches. In some workshops, the POH/IOH of LHB coaches was carried out, but the same needed to be augmented to handle the increase in number of LHB coaches. As a result, the LHB coaches were to be sent to other workshops which results in extra time as well as empty haulage of coaches.

Para 2.4

Recommendations

- 1. Indian Railways need to examine the need to speed up the production of LHB coaches, and ancillary facilities required, if they plan to achieve complete switch over to LHB variant coaches.**
- 2. Availability of adequate infrastructure and other maintenance facilities need to be ensured in the coaching depots and workshops for timely and effective maintenance and POH/IOH of LHB coaches.**