

Chapter 4 - Conclusion and Recommendations

4.1 Conclusion

Audit of 37 selected sections (29 high density routes (HDN) and eight non-HDN routes) of the Indian Railways showed that track maintenance activities needed to be strengthened and undertaken following the laid down instructions and guidelines. Planning for track maintenance needed to be done comprehensively with a view to completely shift towards mechanised maintenance. Inspections were not being done as per laid down frequency by railway officials at various levels including Sr. Section Engineer and Assistant Divisional Engineer in the selected sections. There were deficiencies in conducting Inspections and all prescribed activities of inspection were not being undertaken. In many cases, notes of inspections were not being prepared for further follow up. Timely supervision through (USFD) testing could help detect the vulnerable points and accidents can be avoided. It was seen that USFD testing was not being done as per laid down provisions and thus not used effectively for monitoring track parameters. Though four Track Recording Cars (TRCs) were available, these were not used optimally due to frequent breakdowns and repairs. Non-deployment of TRCs as per laid down frequency over the planned sections also led to non-assessment of track parameters viz., position, curvature, alignment of track, smoothness, rail profile, etc. There were significant arrears in deep screening work, which could impact the resiliency and elasticity of the ballast bed with consequent impact on running quality of tracks. Further, there were delays in de-stressing in selected sections after special maintenance work. This may have a bearing on the safety as thermal stress gets locked up in the LWR/CWR, which may result in buckling or fractures in rails. In respect of track maintenance works undertaken through contractors, there was no clause in the contract for ensuring deployment of only skilled labours under the supervision of trained personnel.

Various activities of track maintenance were guided, driven and undertaken by different formations. While utilisation and allotment of track machines was managed by Chief Track Engineer in Zonal Headquarters, Sr. Divisional Engineer (Coordination) was monitoring allotment and use of USFD machines and Track Recording Cars were under the control of Research, Design and Standard Organisation (RDSO). Thus, there was lack of comprehensive integrated track maintenance plan which could address and take care of all aspects of track maintenance.

To improve the quality of welds and enhancing safety, the population of Alumino Thermite Welds was to be gradually reduced and replaced by Flash Butt welds with the help of mobile flash butt welding plants. Railways however, need to take action and enhance the use of mobile flash butt welding plants.

Railway Board permitted enhanced loading at CC+8+2/CC+8+6/CC+4+2t on various selected sections on various Zonal Railways in 2006. While permitting higher loading, instructions were issued to put in place a mechanism to monitor track for adverse impact of enhanced loading on track and rolling stock and ensure timely corrective action. Zonal Railways were to install necessary machines/equipment /systems for the same. Eleven years after the issue of instructions, as against 270 locations identified, Wheel Impact Load Detector (WILD) system was yet to be installed at all identified locations. Where installed, corrective action was not being taken on the basis of the information/data generated from WILD as Railway Administration ignored most of the critical alarms generated through WILD in Mughalsarai (which feeds the traffic on Mughalsarai-Ghaziabad Section). Other necessary measures such as installing weighbridges to ensure weighment and control overloading, laying of higher strength rails, were also not implemented in all sections where it was required to be done. Running goods trains with enhanced load without ensuring the check and control mechanism in place could lead to poor track conditions and impact the safety of running trains. As such, all the sections notified for CC+8+2/25t axle load required continuous monitoring for track defects and suitable remedial actions. Speed restrictions were imposed due to poor track conditions at many locations.

Infrastructure and other arrangements for track maintenance, as envisaged in Vision 2020 document, were yet to be put in place. Further, manual dependence in the form of push trolley inspection, foot plating, patrolling, etc. continued for detection of flaws and deficiencies of the tracks. The philosophy of track maintenance was yet to shift from 'find and fix' to 'measure and predict'.

Railways had prescribed a formula for calculation of strength of track maintainers/ gang strength on the basis of manual and mechanised track maintenance activities being undertaken by them in 2000. This criteria on the basis of which this formula was derived may not be relevant after 17 years due to significant changes in methods of track maintenance and introduction of mechanised means in a larger number of activities. This formula was also not used by the five selected Zonal Railways to assess the manpower requirement and fill the gap for track maintenance activities during the past three years. There was a

shortage in manpower vis-à-vis sanctioned strength and the situation was made worse by diverting available track maintainers to works other than track maintenance. Due to shortage of gangmen, the length covered by them was increased which can impact the quality of maintenance. Also, equitable distribution of manpower in accordance with workload was not carried out in selected sections of all five Zonal Railways. Adequate training was not provided to the track maintenance staff. 37 per cent, 15.7 per cent and 4.6 per cent of the total staff of NCR, SER and SWR respectively, deployed in LWR/CWR section had not been imparted training. 60 per cent of the staff deployed in working of Small Track Machines (STMs) were not trained. Deployment of untrained staff for operation of STMs and track maintenance could compromise the quality of track maintenance. There was no mechanism to ensure that trained staff was posted to Long Welded Rails/ Continuous Welded Rails (LWR/CWR) sections. The small machines were not available in the selected sections as per requirements. Where available, these could not be used optimally due to various constraints such as frequent breakdowns, non-availability of blocks, non-availability of utility vehicles for transportation of these machines at work sites, non-availability of spares, non-availability of imprest to handle repair and maintenance of these machines etc. In all these selected sections, line capacity utilisation of 2013-14 to 2015-16 ranged between 90 per cent and 168 per cent. As such, these sections required adequate blocks for proper track maintenance. However, blocks provided were much less than blocks demanded which impacted track maintenance.

4.2 Recommendations

Planning and monitoring

- 1. All Zonal Railways should prepare integrated track maintenance plans for day to day as well as periodical maintenance and condition monitoring using machines/ equipment such as USFD machine, Track Recording Cars, etc., duly incorporating timelines and resource requirement/ availability. The plan should include mechanised and non-mechanised components of track maintenance. It should also incorporate addressing arrears of deep screening of ballast, de-stressing and prescribed requirements for operations of CC+8+2 / 25t.***

2. *The integrated annual maintenance plan for track maintenance of a Zonal Railway should be promptly communicated to the divisional and field formations for its effective implementation.*
3. *Patrolling and inspections should be done as per norms and the teams should be equipped with GPS enabled devices. Output of patrolling, inspections should be incorporated into Track Maintenance System through GPS based devices, which can be used for monitoring of patrolling, inspections, etc.*
4. *Monitoring of preparation and implementation of integrated annual maintenance plan for track maintenance over Zonal Railways should be treated as a key results area for Principal Chief Engineer and key performance area for the Chief Track Engineer for Zonal Railways. Co-ordination issues between departments related to monitoring of preparation and implementation of integrated track maintenance plan should be a key performance area for Divisional Railway Managers and key results area for the General Managers.*

Strengthening the process of track maintenance

5. *RDSO prescribed guidelines regarding storage of USFD output and subsequent review / test check / post check should be implemented. Output of USFD should be uploaded to a centralised data base in real time and analysed for monitoring the conditions of the rails.*
6. *Availability, maintenance and operations of Track Recording Cars should be ensured for checking track parameters at prescribed frequency.*
7. *Dual detection has been provided to improve the reliability of signals and decrease the failure of signals. As a side effect, it allows the signals to remain green even when there is a rail fracture and the track circuit has dropped. In such a case when the signal would be green and the train would be moving at maximum permissible speed, there is a risk of accident. Track circuiting system has the potential for detecting rail fractures. Safety Committee had recommended that the signal should be put to yellow aspect as soon as track circuit drops in the dual detection territory so that the train speed is controlled to lower speed while passing the affected zone, which may have rail fracture. Railways may consider using this feature of track circuiting effectively to avert accidents. When a track circuit fails due to any reason, the signal could be put to yellow and the train could be passed only at*

cautious speed, till the track is certified fit by the P-Way Inspector and there is no rail fracture.

- 8. Application system like the TMS should be used efficiently to its full potentiality. Need based access to TMS should be provided to all related functional departments and units namely Operating, Safety, Accounts and Signal & Telecommunication, instead of restricting to the Engineering department only. This will enable effective planning by these departments and enable them to align their operations and maintenance activities to the integrated maintenance plans for the track maintenance. This will also enhance efficiency and effectiveness of block utilisation.*

Adequate provision and effective utilisation of resources

- 9. Railways may consider revising/re-working the formula for calculation of manpower requirement for track maintenance and re-assess the manpower requirement in view of the changed scenario, wherein, more and more mechanised means are going to be used for track maintenance. Diversion of man power provided for maintenance of track for other work should not be permitted. Selection criteria for track maintainers may be aligned with the requirement of their job which includes physical work as well and persons with defective attitude should be adequately sensitized. Deployment of man power should be monitored to ensure proper maintenance of the entire route length.*
- 10. To ensure effective co-ordination between various departments involved, it may be considered to entrust Divisional Railway Managers with the responsibility of monitoring block availability and utilization for regular and periodical maintenance activities.*
- 11. The routes, where enhanced loading over and above the carrying capacity has been permitted, should be equipped with necessary infrastructure. This would include installation of Wheel Impact Load detectors (WILD) to assess impact of enhanced loading on the track structure, installation and utilisation of weighbridges to detect and prevent overloading, up-gradation of track infrastructure, addressing concern of rail grinding, weld protection through joggled fish plates and USFD testing of rails at shorter intervals.*

12. *Officials of the field formations engaged in track maintenance should be equipped with mechanised and digital equipment including Personnel Digital Assistants, GPS enabled communication devices and small track machines. Necessary skills and training should be imparted to the personnel engaged in track maintenance. Appropriate funds in the form of imprest should be provided to enable expeditious maintenance of these machines and equipment. Availability of spares for these machines should also be ensured.*



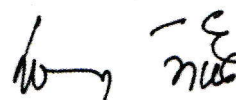
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