Director General
RDSO
Lucknow.

Sub: Speed Policy Framework for Indian Railways.
Ref: Board's letter No. 2017/Mobility/2/3 dated 12.06.2018.

Railway Board has approved the speed policy which envisages operation of passenger trains at 160 kmph on Golden Quadrilateral and Diagonals and at 130 kmph on all other remaining routes on BG network of IR. The letter further directs for taking route wise upgradation initiatives keeping in view all required inputs for fixed infrastructure e.g. Track, Bridge, Signaling, OHE, etc and Rolling Stock e.g. coaches and locomotives.

2. Once speed of mail/express trains is increased to 160/130kmph, it is also essential to enhance the freight trains speed to 100 kmph to reduce speed differential so as to increase the line capacity. For this it is essential that not only the feeder routes to DFC but BG network of IR needs to be made fit to operate freight traffic with 25 T/CC+8+2/CC+6+2 axle load at 100 kmph.

3. Notwithstanding the current state of technology available with individual departments of fixed infrastructure and rolling stock, the realization of above vision of IR needs an interdisciplinary detailed exercise to freeze standards/designs/norms/specification in line with international best practices so that required perspective planning can be done with utmost exigency to physically put in place the required infrastructure in a time bound manner to support operation of both 160 kmph passenger trains as well as freight operation at 100 kmph.

4. One such important area is to fix track and bridge structure required to support the present/proposed rolling stocks through detailed study of their interaction at the envisaged speed and axle load. For track and rolling stock, a similar exercise was done in past in 1967-68 while introducing Rajdhani Express, when the given rolling stocks and locomotives interaction with as given track was studied in detail through exhaustive instrumented oscillation trials to establish the suitability and safety of the proposed operation along with determining maintenance tolerances and maintenance needs both for track and rolling stocks, as contained in C&M-1, Vol.-1.

5. A similar interdisciplinary exercise needs to be done now for supporting high speed of 160 kmph and heavier axle load of 25 T/CC+8+2/CC+6+2 at 100 kmph on sustained basis, also incorporating large number of changes that have taken place over a period of time e.g.

(i) Track structure has changed from wooden/steel sleepers to PSC sleepers.
(ii) Passenger stocks have changed from all coil to LHB for passengers.
(iii) Freight stocks have changed from predominantly 4-wheelers to bogie type wagons.
(iv) Traction has changed from diesel to electric with vision to make it almost 100% with predominant use of CO-CO bogie locomotives.
6. The bridges repaired/strengthened on condition basis and certified fit have, however, largely remained same with more age added to them. In fact out of 1,48,000 bridges, 40,000 bridges are of vintage prior to 1926 which is before enactment of Bridge Rules and in most of the cases even their loading standard to which they were constructed is not known. These changes and issues entail a comprehensive exercise to check the suitability of existing infrastructure so that a detailed road map for inputs needed to upgrade/renew each element of asset route-wise to support the envisaged operation is put in place by all stake holders.

7. Having considered the above, DG/S&T and Board (ME, MT, MTR, MRS & CRB) have approved to form an interdisciplinary team/committee from RDSO with few representative from zonal railways. If required the committee can engage suitable national/international expertise for a professional outcome as per the international norms so that the infrastructure put in place is at par with international railway systems supporting such operations safely and economically. The Terms of Reference (ToR) for the interdisciplinary committee are as under:

(i) Review the oscillation trial criteria and vehicle clearance protocol currently in vogue and align them with the international norms, for which UIC-518 can serve as a guide.

(ii) Detailed instrumentation of representative major & important bridges of various types and studying the interaction at proposed speed and loading for working out inputs for strengthening/rebuilding them, if any.

(iii) Carry out oscillation trials using state of art instrumentation techniques, on run down track on different routes e.g. GQ & Diagonals as design and maintenance needs for speed of 160 kmph can undergo major change; other routes, 25 T nominated/identified routes; etc. selected based on last TRC run using nearin IOH/POH rolling stocks so that maintenance tolerance/limits and needs can be decided for both fixed infrastructure as well as rolling stocks as was done during introduction of Rajdhani Express in 1969.

(iv) Study rail-wheel interaction in respect of forces exerted with the proposed 160 kmph/25T @ 100 kmph operations and optimize rail and wheel profiles for achieving optimum maintainability of rails and rolling stocks.

(v) Working maintenance needs and additional infrastructure needed for various disciplines viz. Track (rail grinding regime, way side monitoring implements to prevent excessive loading/impact, new design of rails/sleepers/fastening, USFD protocol; Ballastless Track); Bridges (Condition monitoring, Strengthening/Rebuilding needs, New Design needs, etc); Rolling Stocks (Way side Condition monitoring, design upgradation needs, additional maintenance infrastructure, etc); OHE (condition monitoring, design upgradation needs, strengthening/replacement needs, etc); Signal and Telecom (Condition monitoring, design change needs, strengthening/replacement needs, etc); Geotechnical Engineering (Formation rehabilitation needs, Sub-ballast needs; Drainage works, etc.); etc.

8. The committee to be formed by DG/RDSO and should submit its report in six months’ time.

9. It is also approved by the Board that RDSO will take the following action:

(i) Provisions of UIC should be implemented in total for bringing Indian Railways measurement and vehicle clearance regime at par with advance railway systems.
(ii) RDSO should expedite procurement of measuring wheels both for freight stocks and passenger stocks for measurement of real time forces so that both moving as well as fixed infrastructure can be designed rationally.

(iii) Provisions of UIC-518 stipulate limiting values for both derailment coefficient involving lateral and vertical forces, as well as that of vertical and lateral accelerations for all kind of rolling stocks including freight and can be adopted for IR when going for UIC-518 to be at par with international standards.

(iv) The measurement of forces as well as accelerations (Vertical & Lateral) are imperative for both passenger and freight stocks as besides forces, vertical and lateral accelerations beyond a limit results in fast fatigue of both rolling stock as well as track components.

(v) Committee should take into account outcome of simulation studies being carried out by RDSO for OHE & PSI.

10. RDSO is advised to take immediate action on the above.

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Additional Member (Civil Engineering)
Railway Board

Copy for information and necessary action to:
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