

 <p>आज़ादी का अमृत महोत्सव</p>	<p>भारत सरकार Government of India रेल मंत्रालय Ministry of Railways रेलवे बोर्ड Railway Board</p>	 <p>Azadi Ka Amrit Mahotsav</p>
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No. 2022/M(C) /143/5

3385868
New Delhi, dt.16.06.2022

Principal Chief Mechanical Engineer,
All Zonal Railways

CME/IT/ Convener
Northern Railway

PED/CAMTECH

ED/Carriage/RDSO

Sub: Review of Yardstick for Coaching Stock

Ref : 1. CRB&CEO's Note No. 2022/CRB/02/01 dated 28.02.22 & 04.05.2022
2.This Office Letter No. 2000/M(C) /143/5 Dated 08.03.22,07.04.22 & 06.05.22

Vide above references, a committee for revision of yardsticks for Coaching maintenance was constituted (CME/IT/Convener, CRSE/ECR, CRSE/WR, CESE/WR, CESE/CR, CESE/SR and GM/CMM/CRIS) to review and revise the existing Yard stick for maintenance activities in Non AC & AC coaches including Mechanical, TL & AC Staff.

The committee has submitted the draft report after review of existing Yardstick and proposed yard stick for maintenance of Vande Bharat trains (Copy Attached). In this regard, it is requested to examine the draft report of committee and submit your recommendation for 'Revision of Yardsticks'.

Since the next review by Board is planned to be held shortly, it is request to to furnish comments by 22.06.2022 for further submission.

This may be treated as "**MOST Urgent**" please


(Suman Kumar Tanti)
Director Mech. Engg.(Chg.)
Railway Board.

Copy-

CRSE/WR, CRSE/ECR, CESE/RS/CR, CESE/SR & GM/CMM/CRIS, New Delhi -For Kind information and necessary action please.

REPORT
ON
Revision of
Yardsticks for
Coaching
Maintenance

REPORT ON Revision of Yardsticks for coaching maintenance

Ref: i) DME/Chg/RB's letter No. 2000/M(C)/143/5 dated 08.03.2022.
ii) DME/Chg/RB's letter No. 2022/M(C)/143/5 dated 07-04-2022

Introduction:

An exercise for revision of yardstick for Coach Maintenance (Mechanical & Electrical) and Vande Bharat Express has been initiated by the Railway Board.

Railway Board has constituted a committee of the officers vide letter no. 2000/M(C)/143/5 dated 08-03-22 to review the yardsticks for coaching maintenance including Train Lighting and AC maintenance, Power Car & Pantry Car. Further vide letter no. 2022/M(C)/143/5 dated 07-04-22, Board has included GM/CMM/CRIS also in the committee.

Working Group and its Mandate:

Vide letters under reference a working group was formed by the Railway Board for preparing the revised yardstick in view of introduction of new products and improved designs, technological improvements, reliability improvement measures, use of IT preventive maintenance regime in many areas assisted by quick mobility arrangements.

The working group consists of following officers;

1. CME/IT/NR, Sh. Angshumali Rastogi – Convenor
2. CRSE/ECR, Sh. Ravish Kumar
3. CRSE/WR, Sh. Tarun Huria
4. CESE/RS/CR, Sh. Manish Bapat
5. CESE/RS/SR, Sh. Amitabh Singhal
6. GM/CMM/CRIS, Sh. Lokesh Singh

The working group was given a mandate to work upon the previous yardsticks of coaching maintenance including Train Lighting and AC maintenance, Power Car & Pantry Car and to propose the revised yardsticks norms. Common goals and individual goals were given to the committee members vide Northern Railway's letter no. 516-M/DMU/staff/YardStick/ML-3 dated 18-03-2022, as given below;

Common Goal:

To review the yardsticks for Coaching Maintenance including Train lighting and AC maintenance, Power Car & Pantry Car with the following scope-

• **Yardstick related**

- To review the existing yardsticks for maintenance activities in Non-AC & AC coaches in-
 - Mechanical maintenance (for LHB/ICF/Vande Bharat trains)

- || TL & AC, Pantry Car & Power car maintenance (for LHB/ICF/Vande Bharat trains)
- **Outsourcing related**
 - Activities for outsourcing to be identified and recommended in-
 - || Mechanical maintenance (for LHB/ICF/Vande Bharat trains)
 - || TL & AC, Pantry Car & Power car maintenance (for LHB/ICF/Vande Bharat trains)
- **Phase wise action plan to achieve recommended yardstick for**
 - Mechanical maintenance (for LHB/ICF/Vande Bharat trains)
 - TL & AC, Pantry Car & Power car maintenance (for LHB/ICF/Vande Bharat trains)
- **CMMS**
 - How to achieve Full fledged implementation
 - || In Mechanical maintenance
 - || In Electrical maintenance
 - How to achieve efficiency with pin-pointed responsibility for maintenance activity done
 - || In Mechanical maintenance
 - || In Electrical maintenance

Individual Goals based on domain expertise:

SN	Item	Domain Experts
1	To review the existing yardsticks for maintenance activities in Non-AC & AC coaches in Mechanical maintenance (for LHB/ICF trains)	CRSE/ECR CRSE/WR
2	Activities for outsourcing to be identified and recommended in Mechanical maintenance (for LHB/ICF trains)	
3	Phase wise action plan to achieve recommended yardstick for Mechanical maintenance (for LHB/ICF trains)	
4	CMMS – Mechanical Portion - How to achieve Full fledged implementation - How to achieve efficiency with pin-pointed responsibility for maintenance activity done	CRSE/ECR CRSE/WR GM/CMM/CRIS
5	To review the existing yardsticks for maintenance activities in Non-AC & AC coaches in TL & AC, Pantry Car & Power car maintenance (for LHB/ICF trains)	CESE/RS/CR CESE/RS/SR
6	Activities for outsourcing to be identified and recommended in TL & AC, Pantry Car & Power car maintenance (for LHB/ICF trains)	
7	Phase wise action plan to achieve recommended yardstick for TL & AC, Pantry Car & Power car maintenance (for LHB/ICF trains)	

8	CMMS – Electrical Portion - How to achieve Full fledged implementation - How to achieve efficiency with pin-pointed responsibility for maintenance activity done	CESE/RS/CR CESE/RS/SR GM/CMM/CRIS
9	To review the existing yardsticks for maintenance activities in coaches in Mechanical & Electrical maintenance for Vande Bharat trains	CME/IT/NR
10	Activities for outsourcing to be identified and recommended in Mechanical & Electrical maintenance for Vande Bharat trains	
11	Phase wise action plan to achieve recommended yardstick for Mechanical & Electrical maintenance for Vande Bharat trains	
12	CMMS – Mechanical & Electrical Portion for Vande Bharat Trains - How to achieve Full fledged implementation - How to achieve efficiency with pin-pointed responsibility for maintenance activity done	CME/IT/NR GM/CMM/CRIS

Deliberations of the Working Group

1. LHB and ICF coach Maintenance yardsticks (Mechanical)

Existing yardsticks of the year 2001 and 2019 issued by the Railway Board vide letter no. 2000/M(C)/143/5 dated 24-12-2001 and E(MPP)2019/1/12 dated 30-09-2019 respectively, have been reviewed for maintenance activities in Non-AC & AC coaches in Mechanical maintenance (for LHB/ICF trains). Activities for outsourcing have also been identified and recommended in the proposal.

Points to be taken into consideration:

- Up to 20% reduction in some yardsticks was done in 2019 from the then existing yardstick advised in 2001.
- For recommending the revised yardstick, increase / decrease in work content in each type of coach from 2001 viz the change in yardstick between 2001 & 2019 have been considered.
- Activities involved in maintenance schedules of each type of coaching stock have been considered, while working out the revised yardstick.
- In the 2019 yardstick, requirement of manpower for a no. of activities like secondary maintenance, supervisory staff for contract monitoring etc. have not been mentioned. However, requirement of such activities have also been reviewed and tabulated.
- Some yardsticks which were available in the 2001 letter and not in the 2019 letter were compared with 2001 yardstick.

S. No.	Category	As per yardstick 2001	As per yardstick 2019	Proposed yardstick	Remarks
1.	Primary Maintenance	1.1 staff/coach	0.85 staff/coach (with interior amenity attention to be outsourced)	<p>0.85 staff/coach (with interior amenity attention to be outsourced)</p> <p>1 staff/coach (without outsourcing of interior amenity attention)</p>	<p>No change</p> <p>Many new on-board facilities have been added with time. These include CCTV, LCD screens, PA-PIS, VESDA, Fire fighting system, Fire suppression system, FIBA, Bio-Vacuum Toilet, pressurize flushing system etc. Hence, more staff needed to keep these in working order.</p>

2.	Secondary Maintenance	0.55 staff/coach	-----	<p>0.8 staff/coach (without outsourcing of maintenance of interior with passenger amenity items). (increased)</p> <p>0.7 staff/coach (with outsourcing of maintenance of interior with passenger amenity items). (increased)</p>	<p>Yardstick of 200 mentioned 0.5 staff/coach for secondary examination. However, as the schedule time for secondary examination is likely to be reduced from 6 hrs to 4 hrs and round trip distance of trains for primary maintenance has gradually increased, more attention is needed during secondary examination. Moreover, many new on board facilities have been added with time. These include CCTV, LCD screens, PA-PIS, VESDA Fire fighting system, Fire suppression system, FIBA Bio-Vacuum Toilet pressurize flushing system etc. Hence, more staff needed to keep these in working order.</p> <p>It is also worth noting that the level of expectations of passengers related to safety, passenger comfort items, furnishing items and cleanliness have also gone up in comparison to the periods since when the last yardsticks were issued.</p>
3.	Terminal attention	0.26 staff/coach	0.3 staff/coach	0.3 staff/coach	No change. This manpower is a must for safety check and for ensuring functionality of all passenger amenity items.

4.	PF return trains nominated for Rolling in Examination Clean Train Station etc.		0.2 staff/coach	0.2 staff/coach	No change. This manpower is needed for safety check of PF return trains However, it is worth noting that most of the activities under this category are already planned to be done through outside agencies. Furthermore adequate supervisors are required for efficient monitoring of works being executed through outside agency
5.	Sick Line attention	0.14 staff/coach holding	0.12 staff/coach holding	0.12 staff/coach holding	No change This manpower is needed to ensure less downtime of DVS coaches
6.	Inspection Carriages	1.76 staff/Inspection carriage	1.76 staff/Inspection carriage	1.76 staff/Inspection carriage	No change. As the carriages are few in number and need personalized attention due to different layout and amenities of each coach, this manpower is needed
7.	Train escorting staff	As per Rly Bd's Lt no. 99/TGV/12/2 dt 13-9-99	Not mentioned	As per Railway Board's letter no. 99/TGV/12/2 dated 13.09.99 or latest related policy.	Train Escorting Staff - for time being it has been proposed to continue with TGV's 1999 guidelines to be reviewed in a fixed time frame in consultation with Passenger Marketing Directorate.
8.	Staff training (Requirement of trainer)	As per training norms	As per training norms	As per training norms	No change proposed

9.	ART & Accident Relief, Millwright, Welfare measure, Ancillary staff	Not covered. To be provided based on existing norms of ART on different type. On need basis for other task	To be provided based on existing norms for ART of different types and on need basis for other different tasks.	As per existing norms for ART & Accident relief activities. On need basis for other balance activities.	No change proposed
10.	Out station/line attention	8 staff (only depot holding 150 or more coaches)	Not mentioned	On need basis	
11.	Linen Management	0.22 staff/AC Coach holding	0.18 staff/AC Coach holding	0.18/AC Coach holding.	No change proposed. The work of distribution of linen in trains is mostly being outsourced over Railways.
12.	Yardstick for cleaning activity				
	Cleaning & complete washing	0.65 staff/coach of all trains examined over the pit line	-----	0.65/coach of all trains examined over the pit line. (If activity is not outsourced)	
				1 supervisor per rake if activity is outsourced.	To ensure a high level of cleanliness as expected by Passengers, the work performed by outsourced personnel are required to be monitored and checked on a regular basis by the supervisor.
13.	Bio-Toilet Maintenance & Laboratory (No yardstick available)				
A	Bio-toilet coaches (up to 500 coaches)			1.4 staff/100 coach holding with AMOC of Bio Toilets.	This staff is needed to monitor the activities of AMOC contractors, do regular super-checks, lab testing etc

B	For every extra 100 coaches.			Additional 0.5 staff with AMOC of Bio Toilets.	This staff is needed to monitor the activities of AMOC contractors, do regular super-checks, lab testing etc
14.	Office & Store Management				
A	Material Cell	26 staff for holding 150 or more coaches		13 staff for up to 150 coaches and additional 1 for every additional 100 coaches (decreased)	Railways will be advise to further explore outsourcing in data entry and accordingly to propose review in Benchmarking
B	Statistical Work	8 staff for holding 150 or more coaches		4 staff for up to 150 coaches and additional 1 for every additional 200 coaches. (decreased)	
C	OBHS	Not mentioned	Not mentioned	1 Supervisor for every 10 rakes. (For outsourced activity).	Supervisory staff is required to handle works being executed through outside agencies.
D	Coach Watering	Based on local conditions		1 Supervisor per Shift for 3 Platforms (For outsourced activity).	
E	Pest Control	Outsourced activity, hence not mentioned)		2 Supervisor for up to 300 coaches + for each 200 additional coaches, 1 additional Supervisor. (For outsourced activity).	

F	Waste Disposal, Pit line sweeping and drain cleaning, Security and locking of rakes	Outsourced activity, hence not mentioned)		2 Supervisor per shift for 300 coaches + For each additional 200 coaches 1 supervisor extra per shift. (For outsourced activity).	
G	Other Contract monitoring	Not mentioned	Not mentioned	2 Supervisors per 300 coaches + 1 Supervisor for each 200 coach extra	

A. Notes:

- i. Leave reserve & rest givers may be provided as applicable in addition to above yardstick.
- ii. The norm does not cover Ministerial staff, Technical staff in offices and Divisional Control staff which may be provided according to local practice.
- iii. Wherever only supervisor has been indicated, these will not be calculated as per laid down ratio of supervisor to staff. These posts are exclusively for supervision and will be created over and above the normal supervisor /staff ratio norms.

B. Activities to be outsourced:

- i) All coach cleaning and watering activities including en-route watering (Already identified for outsourcing).
- ii) Coach amenity attention including carpentry, welding, trimming, plumbing/ pipe fitting and provision of items like window glass, mirror, bottle holder, snack table, taps and faucet etc. (Yet to be outsourced on most of the depots. To be outsourced in a phased manner in next 1-2 years)
- iii) Attention to fire extinguishers (Already outsourced).
- iv) Linen washing and distribution (Already outsourced on most of the depots)
- v) Maintenance for New amenity/security activities like PA/PIS, CCTV & infotainment etc
- vi) Manpower required for statistics/data management (Yet to be outsourced on most of the depots. To be outsourced in a phased manner in next 1-2 years)

CMMS- Mechanical Portion

Full-fledged implementation

- i) Presently, there are multiple variants of trains viz. main line Coaches, EMU/DEMU/ Memu Coaches and Train set (Vande Bharat). For achieving full fledged digital implementation, all variants of the trains must be brought under CMMS and all depots also must be provided with necessary IT infrastructure. However, to date , only ICF & LHB train variants and 89 coaching depots (65 in Phase-1 and 24 in Phase 2) are covered within the ambit of CMMS, even though same is functional across all depots of IR and more than 95% Brake Power Certificate are issued through the CMMS.
- ii) CMMS's Functionalities are quite well compliant with core rake maintenance activities, primary, secondary pit examination and terminating examinations as for as ICF & LHB stocks are concerned. However, functionalities for en-route examination, platform examination, and other platform activities need to be provided.
- iii) Although the currently developed solution is available to be used by all the coaching depots of IR and quite a few non-sanctioned depots are using it with the limited resources and thus data entry is not complete or regular which may lead to mismatch of key performance indicators leading to inability in decision making. However, it needs to be appreciated that the trains from the depots are terminating at other depots and the data entry cycle will not be complete unless all depots are linked in the system. Thus complete benefits of the system would no longer be available due to gaps in data and heavy mismatches due to non-availability of IT infrastructure.
- iv) To fill the gaps and also to achieve full fledged implementation, the remaining depots of IR as well as uncovered Train set/EMU/DEMU sheds must be brought under CMMS and requisite software solutions and hardware for user fields also need to be met.
- v) Since the functioning of Train Set/EMU/DEMU sheds and their maintenance processes like Rake formation/modification rules, coach set formation, schedules, data formats etc. are quite different from the functioning and maintenance of coaching depots, a fresh development effort would be required. To carry out remaining and additional requirements, fresh sanctions would be required as per CRIS.
- vi) According to the CRIS, for inclusion of the balance coaching depots and also the Train Sets/EMU/DEMU sheds in CMMS , a proposal costing Rs 51 Crores as Phase-III (for covering Balance Coaching depots) and Rs 59 Crores as Phase IV (for covering fresh development for Train set/EMU/DEMU Stocks) were submitted to Railway Board under umbrella works, Plan Head-17 (Computerization) vide letter nos 2016/CRIS/NDLS-ITPI/CMM/Budgets/0055PT-1 dated 08.09.2020 and CRIS's letter no 2016/CRIS/NDLS-ITPI/CMM/Budgets/0055PT-1 dated 23.03.2021 in response to ED/C&IS/RB's letter no 2020/C&IS/Project/Proposals/Umbrella 2020-21/2 Pt.1 dated 05.03.2021.

The committee feels the essentiality of having sanctions of Phase III & IV to achieve full fledged implementation by provision of user

requirements in software, hardware and networking at field level and therefore, requests the Railway Board to sanction them on priority.

- vii) Furthermore, additional functionalities need to be developed on the present module to pave the way for a paperless maintenance system as well as seamless availability of information across IR ,
- a. A module on wheel / trolley management needs to be developed on CMMS to allow monitoring of performance of wheels and trolleys/ trolley safety components. Provision for every spring / wheel/ trolley change in coach should be made in CMMS. Any change of spring / wheel disc / dashpot / silent blocks etc. before the warranty period should automatically trigger the warranty claim.
 - b. A module for monitoring of all trial items by RDSO / PUs should be made in CMMS, so that BPC is not issued until the details of the items are filled in. This will allow transparent remote monitoring of the trial items on a real-time basis.
 - c. Module on linen management should be developed and be integrated with RailMadad complaint monitoring.
 - d. Monitoring of performance of OBHS (application for biometric and geotagged attendance and photos/videos of cleaning) integrated with RailMadad complaints should be developed. Random passenger survey functionality should be provided on RailMadad.
 - e. For improving data utility and reliability, PUs need to be roped in for issuing RSCs on CMMS and for updating all assembly details.
 - f. CMMS data should be interfaced with UDM so that PO and issue details of important identified assemblies/components should automatically be updated in CMMS coach master data on issuing in UDM; warranty complaints should be automatically generated.
 - g. Watering/ CTS module to be developed on CMMS to monitor watering of coaches and should be interfaced with RailMadad to flag stations where watering was not done.
 - h. Overdue IOH/POH coaches should automatically be flagged in CMMS and issue of their BPC of such overdue coaches should require higher officer's authorization.
 - i. Provision to generate a list of each sick / unattached coach (Yard position) should be available on CMMS, along with remarks regarding reasons (to be pulled from ICMS).
 - j.
- viii) To start the preparatory work of fresh software of Trainset/EMU/DEMU stocks, CRIS requires standard work process diagram, standard schedule forms and the definition of coach type wise asset hierarchy (maintenance BOM) including electrical items that can be fed into system right from PU/Workshop, updated in depots whenever items are being changed so that end to end tracing of each item can be ensured. All key values, mandatory and optional, for each item may be identified to be maintained in the system

so that the same may be enforced. CAMTECH may be asked to prepare and standardize requisite information immediately.

CMMS-pinpointed responsibility

The pinpointing of responsibility of each of the stakeholders like vendor approver, supplier, product inspector, maintainer, purchaser in any business process is a key determinant for continual improvement. To ensure it, transparent and seamless realtime data exchange between the different workplaces of IR is essential and that is possible by leveraging IT technology.

So, to effectuate it following actions would be desired-

1. The system of direct part marking (having a unique identifier) needs to be introduced in new inventory to monitor, track, and pinpoint accountability/ traceability. System for tracking the field maintenance activities using RFID and image & Video evidence. Further, image and video analytics can be applied to pinpoint problems.
2. Integration of CMMS/WISE with related IT applications like UDM for inventory, RFID for tracking ,iMMS for inspection, UVAM (Vendor) & HRMS (Staff) for accountability
3. Pinpoint automated tracking of stock within the maintenance facility.
4. Integration with OMRS (WILD/Acoustic Bearing Detector) for real time/batch analytics
5. Integration with machine vision based inspection of rolling stock device (MVIS), Hot axle and Hot Wheel Detector (HAHWD) for bearing & brake binding, Hot Axle Bearing Detector (HABD/HBD) for axle box for preventive action
6. Integration with CCTV of coaches for tracking onboard activity to pinpoint any antisocial activity/ substandard services
7. Monitoring of onboard Fire Alarm & suppression system

2. LHB and ICF coach Maintenance yardsticks (Electrical)

Existing yardsticks of the year 2004 and 2019 issued by the Railway Board vide letter no. 2000/Elec(G)/181/21 dated 30.11.2004 and E(MPP)2019/1/12 dated 30-09-2019 respectively, have been reviewed for maintenance activities in Non-AC & AC coaches in Electrical maintenance (for LHB/ICF trains). Activities for outsourcing have also been identified and recommended in the proposed Mechanical maintenance (for LHB/ICF trains)

Points to be taken into consideration:

- f) About 20% reduction in various yardsticks was done in 2019 from the then existing yardstick advised in 2004.

- g) For recommending the revised yardstick, increase / decrease in work content in each type of coach from 2004 viz the change in yardstick between 2004 & 2019 have been considered.
- h) Activities involved in maintenance schedules of each type of coaching stock have been considered, while working out the revised yardstick.
- i) In 2019 yardstick, requirement of manpower for material storage / accountal, statistical work etc. are not mentioned. However, requirement is reviewed and tabulated.
- j) Yardstick for some of the new variants like, LSLRD, LVPH, LDSLRA, LWCBAC, Double Decker coaches were not available. Yardsticks for these are recommended based on the closest type of coach for which yardstick are available.
- k) Yardsticks regarding, manpower for AC unit in Power car, LR, RG etc. which were not available in 2019 were taken as issued in 2004 letter.

S. NO.	Category	As per yardstick 2004	As per yardstick 2019	Proposed yardstick	Remarks
1.	SG TL Primary	0.3 staff/coach holding	0.24 staff/coach holding	0.21 staff/coach holding (decreased)	<p>Increase in workload:</p> <ul style="list-style-type: none"> • Mobile charging points.(18 coach) • Emergency Light Units. • IOH schedule. • 09 nos of additional fans in GS coaches. <p>Decrease in workload:</p> <ul style="list-style-type: none"> • LED lights in lieu of FLs. • VRLA batteries in lieu of Flooded type. • BLDC fans in most of the coaches in lieu of Carbon brush fans.

2.	LHB TL Primary	0.3 staff/coach holding	0.24 staff/coach holding	0.24 staff/coach holding	<p>No change</p> <p>Increase in workload:</p> <ul style="list-style-type: none"> • HV panel • 9 kVA transformer • Feeder Junction boxes • ZS couplers • RBC cum EBC • Mobile charging points. (4 per bay) • Emergency Light Units. • IOH schedule. • 09 nos of additional fans in GS coaches. <p>Decrease in workload:</p> <ul style="list-style-type: none"> • Alternator • RRU • V Belts • LED lights in lieu of FLs. • VRLA batteries in lieu of Flooded type. • BLDC fans in most of the coaches in lieu of Carbon brush fans.
3.	LSLRD (LHB non-AC SLRD coach with HOG panel)	-----	Not mentioned	0.26 staff/coach holding New coach	<p>Increase in workload:</p> <p>In addition to a LHB TL coach, SBC is provided in this coach for feeder & HOG control and protection.</p> <p>Decrease in workload:</p> <p>NIL as compared to a LHB TL coach.</p>
4.	LVPH (LHB high capacity parcel van)	-----	-----	0.20 staff/coach holding New coach	<p>Increase in workload:</p> <p>As compared to LHB TL. Rotary switch arrangements in end walls for charging and lighting control.</p> <p>Decrease in workload:</p> <p>RSW panels on-board. Lights, Fans Mobile chg sockets</p>

5.	TL Secondary	0.15 staff/coach	0.15 staff/coach	0.15 staff/coach	No change Increase in workload: <ul style="list-style-type: none"> • HV panel • 9 kVA transformer • Feeder Junction boxes • ZS couplers • RBC cum EBC • Mobile charging points. (4 per bay) • Emergency Light Units. • 09 nos of additional fans in GS coaches. Decrease in workload: <ul style="list-style-type: none"> • Alternator • RRU • V Belts • LED lights in lieu of FLs. • VRLA batteries in lieu of Flooded type. • BLDC fans in most of the coaches in lieu of Carbon brush fans.
6.	TL Train Passing	0.07 staff/coach	0.05 staff/coach	0.05 staff/coach	No change
7.	TL sick line attention	0.05 staff/coach	0.05 staff/coach	0.05 staff/coach	No change
8.	SG AC Primary	1.4 staff/coach	1.1 staff/coach holding	1.2 staff/coach holding (With AMC for 25 kVA inverter) (Increased) 1.0 staff/coach holding (With AMC for both 25 kVA inverter & RMPU) (Decreased)	Increase in workload: <ul style="list-style-type: none"> • Mobile charging points. (02 no's / bay) • Emergency Light Units • IOH schedule Decrease in workload: <ul style="list-style-type: none"> • LED lights in lieu of FLs.

9.	EOG AC Primary	1 (For ICF EOG)	0.8 staff/coach holding	0.8 staff/coach holding (With AMC for RMPU) 1.0 staff/coach holding (Without AMC for RMPU) (Increased)	<p>Increase in workload: As compared to ICF EOG.</p> <ul style="list-style-type: none"> • SBC in lieu of 01 power panel and 2 AC control panels. • RBC cum EBC / RBC + EBC / EBC + EBC in lieu of a simple 24 V charger. • Mobile charging points. (One per passenger) • Emergency Light Units. • IOH schedule. • 110 V, 70 Ah VRLA battery in-lieu of 24 V/120 Ah battery. • 5 kVA transformer for mobile charging points. <p>Decrease in workload:</p> <ul style="list-style-type: none"> • LED lights in lieu of FLs. • VRLA batteries in lieu of Flooded type. • Fans.
10.	LWCBAC	1 (ICF EOG)	----	1.0 staff/coach holding (With AMC for RMPU) 1.2 staff/coach holding (Without AMC for RMPU) New coach (Increased)	<p>Increase in workload: As compared to LHB AC.</p> <ul style="list-style-type: none"> • All electrical cooking appliances (Flameless pantry car) viz., • Hot case (3 nos), • Hot water boiler (3 nos), • Bottle cooler, • Deep freezer, • Hot plates (8 nos), • Chimney, • Soup warmer. • One 60 kVA transformer. <p>Decrease in workload:</p> <ul style="list-style-type: none"> • Lights, • Mobile charging sockets
11.	Double Decker coaches	1 (ICF EOG)	1 staff/coach holding	0.9 staff/coach holding (With AMC for RMPU) (decreased) 1.1 staff/coach holding (Without AMC for RMPU) New coach (Increased)	<p>Increase in workload: As compared to LHB AC.</p> <ul style="list-style-type: none"> • 10 Ton in lieu of 7 Ton AC plants, though making little change in maintenance requirement. • One additional 60 kVA transformer. • Mini pantry with electrical appliances. • Additional Lights, • Additional Mobile charging sockets.

12.	SG AC Secondary	0.7 staff/coach holding	0.46 staff/coach holding	0.4 staff/coach holding (decreased)	Increase in workload: <ul style="list-style-type: none"> • Mobile charging points. (02 no's / bay) • Emergency Light Units. Decrease in workload: <ul style="list-style-type: none"> • LED lights in lieu of FLs.
13.	EOG AC Secondary	0.5 staff/coach	0.36 staff/coach holding	0.3 staff/coach holding (decreased)	Increase in workload: As compared to ICF EOG. <ul style="list-style-type: none"> • SBC in lieu of 01 power panel and 2 AC control panels. • RBC cum EBC / RBC + EBC / EBC + EBC in lieu of a simple 24 V charger. • Mobile charging points. (One per passenger) • Emergency Light Units. • IOH schedule. • 110 V, 70 Ah VRLA battery in-lieu of 24 V/120 Ah battery. • 5 kVA transformer for mobile charging points. Decrease in workload: <ul style="list-style-type: none"> • LED lights in lieu of FLs. • VRLA batteries in lieu of flooded type. • Fans
14.	AC Train Passing EOG	0.12 staff/coach	0.05 staff/coach	0.05 staff/coach	No change
15.	AC Train Passing SG	0.13 staff/coach	0.05 staff/coach	0.05 staff/coach	No change
16.	AC sick line attention	0.25 staff/coach	0.2 staff/coach	0.2 staff/coach	No change

17.	Power cars	1.2 staff/coach	-----	1.2 staff/coach	No change Increase in workload: As compared to ICF Power car <ul style="list-style-type: none"> • 02 SBCs in-lieu of 1 power panel. • RMPU in lieu of cassette AC • RBC cum EBC / RBC + EBC / EBC + EBC in lieu of a simple 24 V charger. • Three 60 kVA transformers in-lieu of two 50 kVA transformers. • IOH schedule. • 110 V, 70 Ah VRLA battery in-lieu of 24 V, 120 Ah. • HOG couplers. Decrease in workload: <ul style="list-style-type: none"> • LED lights in lieu of FLs.
18.	LDLRA (Power car with single underslung DA set)	-----	Not mentioned	0.7 staff/coach New coach	Increase in workload: As compared to LWLRRM <ul style="list-style-type: none"> • One 9 kVA Transformer. • Fans Decrease in workload: <ul style="list-style-type: none"> • One DA set • RMPU, • 02 nos 60 kVA Transformers. • 02 Radiator motors • 04 Vent motors.
19.	Material storage AC	13	Not mentioned	1 per 25 AC coach holding	
20.	Material storage TL	15	Not mentioned	1 per 50 TL coach holding	
21.	Statistical work	8	Not mentioned	1 per 100 coach holding	

i. **Activities for outsourcing.**

- i. Maintenance schedules of DA sets of power cars.
- ii. 'A' check and escorting of Power cars.
- iii. Escorting duties of AC coach attendants.
- iv. For TL coaches – Non core activities of cleaning of lights, fans, Junction boxes etc can be outsourced.
- v. Outsourcing repair of RBC & RBC cum EBC.

ii. Transition & Phase wise action plan:

Three month time period:

- i. Issue of revised yardsticks for maintenance & escorting.
- ii. Adoption of revised scale of deployment for escorting.

Six month time period:

- i. Outsourcing the Maintenance schedules of DA sets of power cars.
- ii. Outsourcing the 'A' check and escorting of Power cars.
- iii. Outsourcing the escorting duties of AC coach attendants in short distance trains.

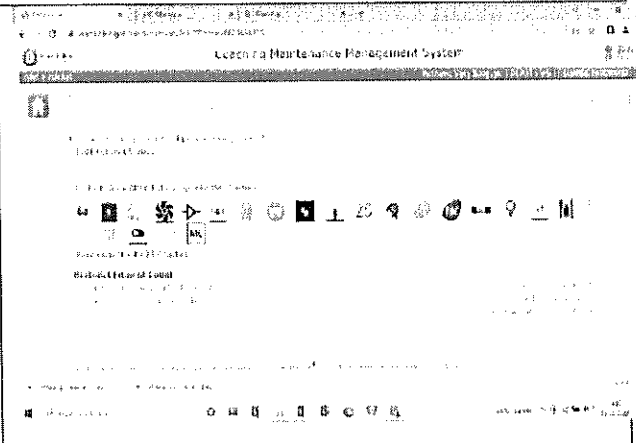
One year time period:

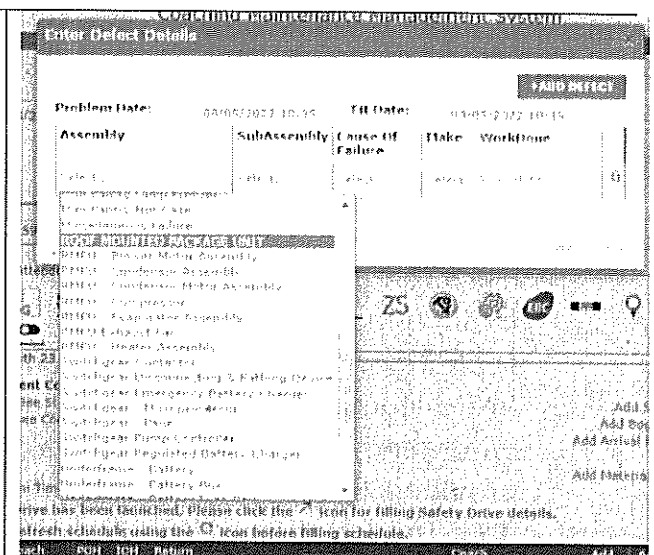
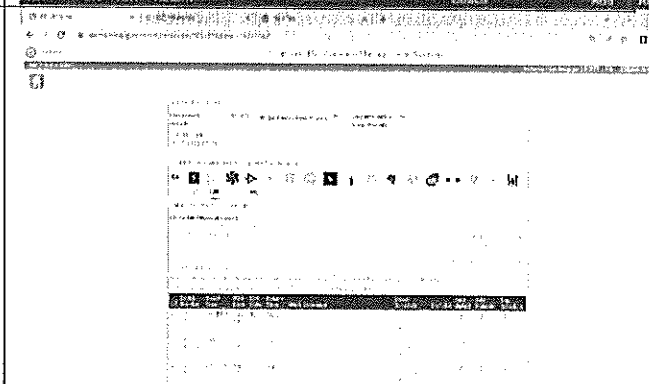
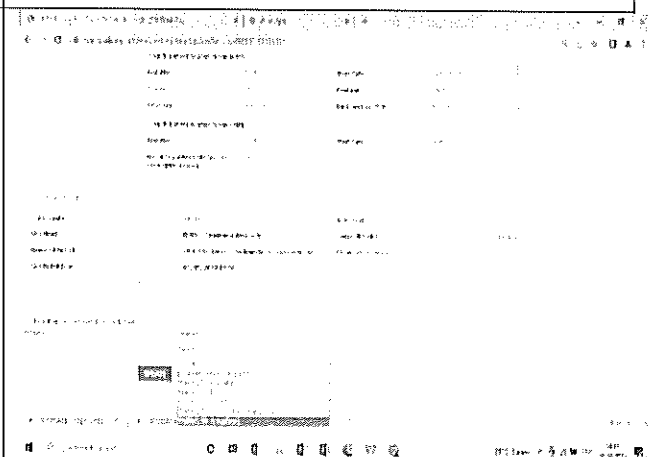
- i. Review of staff sanction based on the revised yardstick.
- ii. Proposals for surrender / creation of posts as per requirement based on revised yardstick.
- iii. RB should issue directives for Personnel Branch to ensure sanction as per the yardstick finalised.

CMMS:-Electrical Portion

Coaching Maintenance Management System:

CMMS is a portal for uniformity to feed data, centralization of data i.e. one platform it provides data transparency within zones and division to make data readily available for analysis. This will also help in paper less working and improved efficiency in work. Some suggestions for further improvement are as under:

SN	Suggestion	Remark	
1	For maintenance related data entry: main equipment icon (DDR) should have sub categories in the form of drop down menu for data feeding by user so that typing work will be reduced.	This will simplify the real time data entry by supervisor during maintenance and will eliminate possible human errors during data entry to investigate, to facilitate.	

<p>2</p>	<p>For data feeding during maintenance, drop down assembly menu should display only the relevant sub-assemblies as per the type of coach.</p> <p>(Presently all equipment dropdown showing)</p>	<p>This will simplify data entry and avoid selection of wrong sub assembly.</p>	
<p>3</p>	<p>Option for feeding data of various drives advised by Rly. Board/Zonal railways etc. should be incorporated in CMMS.</p>	<p>Time in data entry for various drives will be saved. The Safety drive link is not accessible for Electrical safety drive.</p>	
<p>4</p>	<p>Facility of data entry for HSD oil filling details and Power car running hours should be incorporated in the CMMS module.</p>	<p>For Effective monitoring of HSD consumption and optimal utilization of DA sets of power car operation.</p>	<p>It will ensure effective monitoring of HSD oil consumption.</p>
<p>5</p>	<p>Remarks for ineffective coaches > Reason Coolum Drop-down box showing only mechanical data entry Provision of electrical defects should also be there.</p>	<p>This will help in analysing the ineffective coaches for the reason they are pending in a better way.</p>	

3. Vande Bharat Train coaches Maintenance yardsticks

Vande Bharat Express trains are the first of its kind semi-high speed trains designed and manufactured in India. At present, two rakes of Vande Bharat express are plying between NDLS-BSB and NDLS-SVDK. More rakes are likely to be introduced all over the Indian Railways soon. These trains have many world class features not found in conventional trains, which include distributed power, underslung traction equipment, semi-permanent couplers, automatic plug doors, sealed gangways etc. Also, some of the safety features of Vande Bharat rakes are uncommon with conventional rakes. For example; there are no designated emergency windows in the rake, rather diamond tipped hammers have been provided to break window panes in case of emergencies, likewise ACP does not drop the brake pressure it simply gives a signal to Loco Pilot who can then take decision based on the circumstances.

There is no yardstick available for the Vande Bharat Express rakes till date. These two rakes are being maintained in Northern railways for the last 3 years. On the basis of experience gained by the Northern Railways, new yardsticks for the maintenance of Vande Bharat Express have been framed. Activities for outsourcing have also been identified and recommended in the proposed yardsticks of Vande Bharat Express.

It may be noted that these yardsticks are combined for Mechanical, Electrical and Traction requirements.

S. NO.	Category	Proposed yardstick	Remarks
1.	Primary Maintenance	2.3 Staff/Coach (with interior amenity attention to be outsourced)	
		3.1 Staff/Coach (without outsourcing of interior amenity attention)	Trainset contains many new on-board facilities like CCTV, LCD screens, PA-PIS, PECU etc.
2.	Secondary Maintenance	1.7 Staff/Coach (without outsourcing of maintenance of interior with passenger amenity items).	
		1.4 Staff/Coach (with outsourcing of maintenance of interior with passenger amenity items).	Trainset contains many new on-board facilities like CCTV, LCD screens, PA-PIS, PECU etc.
3.	Terminal Attention	0.3 Staff/Coach	This manpower is must for ensuring safety and functionality of all passenger amenity items.

4.	Sick Line attention	0.32 Staff/Coach Holding *	This manpower is needed to ensure less downtime of Trainset rakes *For regular attention.
5.	Train Escorting staff	As per Railway Board's letter no. 99/TGV/12/2 dated 13.09.99 or latest related policy.	
6.	Staff Training	As per training norms	
7.	ART & Accident Relief, Millwright, Welfare measure, Ancillary staff	As per existing norms for ART & Accident relief activities. (On need basis for other balance activities.)	
8.	Out station / line attention	On need basis	
9.	Linen Management	0.18 Staff/AC sleeper Coach holding.	Same as that for LHB coach
10.	Yardstick for cleaning activity		
	Mechanized Coach Cleaning (including watering of coaches and other misc. activities)	0.65/coach of all trains examined over the pit line.(If activities are not outsourced)	Same as that for LHB coach
		1 supervisor per rake if activity is outsourced.	Same as that for LHB coach
11.	Vacuum assisted Bio-Toilet Maintenance		
A	Bio-toilet coaches (up to 500 coaches)	1.4 staff/100 coach holding with AMOC of Bio Toilets.	Same as that for LHB coach
B	For every extra 100 coaches.	Additional 0.5 staff with AMOC of Bio Toilets.	Same as that for LHB coach
12.	Office & Store Management		

A	Material Cell	21 Staff for up to 300 coaches and additional 1 for every additional 50 coaches	Railways will be advised to further explore outsourcing in data entry and accordingly to propose review in Benchmarking
B	Statistical Work	12 Staff for up to 300 coaches and additional 1 for every additional 150 coaches	
C	OBHS	1 Supervisor for every 10 rakes. (For outsourced activity).	Supervisory staff is required to handle works being executed through outside agency.
D	Coach Watering	1 Supervisor per Shift for 3 Rakes (For outsourced activity).	
E	Pest Control	2 Supervisors for up to 300 coaches + for each 200 additional coaches, 1 additional Supervisor. (For outsourced activity).	
F	Waste Disposal, Pit line sweeping and drain cleaning, Security and locking of rakes	2 Supervisors per shift for 300 coaches + For each additional 200 coaches, 1 supervisor extra per shift. (For outsourced activity)	
G	Other Contract monitoring	2 Supervisors per 300 coaches Additional 1 Supervisor for each 200 coach extra	
H	Mechanized Laundry	1 Supervisor per shift per laundry. (Activity may be outsourced)	

A. Notes

- i. Leave reserve & rest givers may be provided as applicable in addition to above yardstick.
- ii. The norm does not cover Ministerial staff, Technical staff in offices and Divisional Control staff which may be provided according to local practice.

- iii. Wherever only supervisor has been indicated, these will not be calculated as per laid down ratio of supervisor to staff. These posts are exclusively for supervision and will be created over and above the normal supervisor /staff ratio norms.
- iv. The above yardsticks do not include laboratory, shed cleaning, training school and other running staff like shunters, canteen, security, watch and ward activities, control room, grievances cell, MillWright shop etc.

B. Activities to be outsourced

- i. All coach cleaning and watering activities including en-route watering (Already identified for outsourcing).
- ii. Coach amenity attention including carpentry, welding, trimming, plumbing/pipe fitting and provision of items like window glass, mirror, bottle holder, snack table, taps and faucet etc. (To be outsourced in a phased manner in next 1-2 years)
- iii. Attention to fire extinguishers (Already outsourced).
- iv. Maintenance for New amenity/security activities like PA/PIS, CCTV & infotainment etc
- v. Manpower required for statistics/data management (Yet to be outsourced on most of the depots. To be outsourced in a phased manner in next 1-2 years)

Conclusion:

The latest yardsticks for the Mechanical and Electrical coach maintenance were issued by the Railway Board vide letter no. E(MPP)2019/1/12 dated 30-09-2019. However, a large number of activities were not considered in this letter.

Therefore a comprehensive exercise to review the manpower yardstick for activities related to coaching maintenance has been done and accordingly revisions in yardsticks, wherever required, have been proposed.

Proposed yardsticks have been prepared considering introduction of new items like Automatic coach washing plants etc. and outsourcing of non core activities involved in rake examination and sick line maintenance of coaches. Furthermore, while considering staff requirement due to outsourcing, it is to be kept in mind that IR staff directly engaged in maintenance activities reduces drastically. However, requirement of supervisors to supervise the contractual works for outsourced activities increases. The requirements of supervisors have accordingly been indicated for outsourced activities only, which should not be accounted while assessing the requirement of staff in case there is no outsourcing of that activity.

During the years 2020 and 2021 train services were impacted due to COVID pandemic. No major changes have been made during this period either in the maintenance practices or in induction of new technology, except for the introduction of Vande Bharat trains which have been considered separately in this report.

It is also proposed that these yardsticks be reviewed every 5 years to reflect the impact of latest technical developments, induction of new technology and policy changes.

List of documents attached:

1. DME/Chg/RB's letter No. 2000/M(C)/143/5 dated 08.03.2022.
2. DME/Chg/RB's letter No. 2022/M(C)/143/5 dated 07-04-2022.
3. Railway Board vide letter no. 2000/M(C)/143/5 dated 24-12-2001.
4. Railway Board vide letter no. 2000/Elec(G)/181/21 dated 30.11.2004.
5. Railway Board vide letter no. E(MPP)2019/1/12 dated 30-09-2019.

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