REPORT
OF
TASK FORCE ON SAFETY

10 Jan, 2017
GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS (RAILWAY BOARD)
TASK FORCE ON SAFETY

Secretary,
Railway Board,
Ministry of Railways (Railway Board)
New Delhi

Dear Sir,

Submission of Report

We are happy to submit the Report of the Task Force on Safety, constituted by the Ministry of Railways vide letter no. ERB-I/2016/23/66, dated: 06-12-2016.

The Task force made an interim presentation to the Board and General Managers on 29th December delineating some key issues, which needed immediate attention of Indian Railways’ Management at all levels. We feel that action on these key points would bring about immediate improvement in the Safety levels in the Railways. A copy of the presentation is attached at the end of the report as an annexure.

The Detailed Report submitted herewith lays down Short, Medium and Long Term Interventions required to bring the Standards of Safety in Train Operations and other aspects of Railway functioning to a high, yet sustainable level, and lays down the Technological and Organisational Initiatives to achieve it.

We thank you for the opportunity given to us to contribute to this Important aspect of Train Operations.

ARUN SAKSENA
(Chairman)
General Manager,
North Central Railway

S. ANANTHARAMAN
(Member)
Chief Operations Manager,
Southern Railway

SHUBHRA NSH
(Convener)
Chief Safety Officer
Central Railway

New Delhi
10th January 2017
ORDER

Ministry of Railways (Railway Board) have decided to constitute a Task Force to suggest system and process to improve the safety performance of Indian Railways. The Task Force will consist of the following:-

(i) Mr. Arun Saxena, General Manager/N.C.Railway ....Chairman
(ii) Mr. Shubranshu, CSO/Central Railway ....Convenor
(iii) Mr. Satish Kumar, AGM/Eastern Railway ....Member
(iv) Mr. Ananthraman, COM/Southern Railway ....Member
(v) Mr. John Thomas, CEE/S.C.Railway ....Member

2. The Terms of reference of the Task Force will be as under:-

1) To conduct data analysis, analysis of sample of previous investigation reports, field interviews etc to develop a factual view on potential solutions;
2) To identify 4-5 big actionable interventions across each area to improve safety performance i.e. Rolling Stock, Track, OHE, Points and Crossing, Organisational interventions etc; and
3) For each of the intervention, to develop an implementation plan, clearly laying out who needs to do what by when.

3. The Task Force should submit its succinct and actionable report within two weeks from the date of constitution of the Task Force.

4. The Headquarters of the Task Force will be at New Delhi.

5. Safety Directorate of Railway Board will be the Nodal Directorate for functioning of the Task Force. Therefore, all related works/issues including Parl. Questions, RTI cases, their execution and other formalities with regard to the Task Force, should be dealt with by Safety Directorate.

6. The Chairman, Convenor and Members of the Task Force will draw TA/DA as per extant Rules.

(Adesh Kumar)
Under Secretary (Estt.)
Railway Board
PREFACE

Members of the Task Force have deliberated on the shortcomings that beset Safety in Indian Railways and solutions to overcome these and to create an environment that nurture a culture of safety, encourage honesty in admitting failures and provide a lasting framework to sustain it, both organizationally and technologically.

2. While we do recommend induction of technology to move away from errors in human judgement and to provide consistency in maintenance standards and response to unsafe situations, we also strongly feel that return to the basic principles of safety and established & proven ways of our working must be given the highest priority. Some of these are laid down in our elaborately enshrined rules in the form of Manuals, Codes, Maintenance Instructions, Technical Guidelines and Instructions. Some others are laid down in our system of Inspections and their follow-up. Inspection is not only a means to find mistakes and shortcomings, but also provides a first-hand opportunity to Officers and Supervisors to meet the staff in the field and to guide and counsel them.

3. “Going Back to Basics” should be the safety theme of Indian Railways at all times. Shortcuts and workarounds, howsoever easy, tempting and practical they may seem, must be shunned at all costs. In other words, maintenance practices must be followed to the letter – correct material, fittings and spares as provided in Manuals must be provided without fail, training of staff kept up-to-date through promotional and refresher courses as well as through direct interaction. Personal whims and convenient interpretation of rules by officers and Supervisors should not be allowed to play havoc with the basic tenets of safety. It would be the role of senior officers to ensure this.

4. As the speeds and throughput increase and availability of staff per unit asset falls, there is a need to adopt a technological strategy of Online Monitoring of all Assets, Fixed & Rolling Stock, so as to create a Platform for Condition Based Predictive Maintenance for Zero Defects.

5. Technical Specifications of sub-assemblies, spares and tools & plants must be drawn stringently and suppliers must be chosen carefully. New technology must come with suitable upgradation of skills of those who handle it and a long-term support system from the suppliers and industry at large.

6. There is also a need to provide for funds in our budget for safety works and safety items on topmost priority. Depreciation Reserve Fund must be adequately endowed to enable renewal of old and worn-out assets as an organisational objective sans compromise.

7. Empowerment of field officials is a continuously running theme in the Report. Some of the recommendations will appear outrageous and very high, yet we request the Railway Ministry to consider them with an open mind. “Empower, then question” should be the new organisational ethos, not only in matters of safety, but in all aspects of running a dynamic and nimble organization.

8. A single nodal authority, preferably the Advisor/Safety, should be nominated to ensure implementation of the recommendations of the Task Force.
METHODOLOGY

The task force on safety interacted comprehensively with the stakeholders and players in areas of Railway Safety. We interacted with senior officers in various Zonal Railways and Railway Board and held detailed discussions with them. We also went out into the field and discussed matters of safety with staff and supervisors at the forefront. This exercise gave us insight into the policies, practices and deviations of one from the other.

2. The task force also studied various reports submitted earlier on Railway Safety, the main ones being the Corporate Safety Plan, the Report of the Railway Safety Review Committee, 1998 (Khanna Committee) and the report of the High Level Safety Review Committee (Kakodkar Committee). A lot of data was simultaneously collected from the field, Zonal Railways and Railway Board to quantitatively evaluate the ground level realities, statistics, compliance with earlier reports, state of finances, etc.

3. References to earlier reports are given at the appropriate places. The recommendations of this Task Force may be different from the exact recommendations in these earlier reports, yet references will emphasise the fact that the issues mentioned therein have attracted attention of authorities and experts on earlier occasions as well.

4. The task force has considered areas where immediate action will bring about significant improvement in levels of safety without much financial inputs. At the same time the report dwells, at great length, in such areas of technology, which IR must consider for sustained safety with minimal human intervention.

5. The report submitted hereby contains concrete actionable points, short, medium and long term. Responsibility for each action point and suggested time-frame is mentioned alongside each recommendation in square brackets.

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1. Accidents – Broad Statistics

While it is true that train accidents have come down in absolute numbers, Indian Railways, as a public carrier, must ensure safety of very high standards. While accidents cannot possibly be brought down to nil, deaths and injuries should certainly be considered unacceptable, whether in a running train, on LC Gates or at the work-place. Some of the key derivatives from the accident statistics are as follows:

1.1. Even though there has been a significant reduction in train accidents over the last 10-15 years, recent years see a plateauing of figures at around 100-120 Consequential Accidents. (Annexure – 1)

1.2. Incidences of derailments constitute over two-thirds of all accidents followed by Unmanned Level Crossing Gate Accidents.

1.3. Failure of Railway Staff is the biggest cause (50-60%) of all accidents.


1.5. Asset Failures (Track defects such as Rail Fracture, inadequate maintenance, track geometry etc.) remain the single largest contributor as a cause of accidents. This is followed by failure of Mechanical Assets. (Annexure – 3)

This report addresses the underlying causes and proposed solutions, both organisational and technical, in following paras.

2. Maintenance of Coaches in the field:

Rolling Stock – Nature of Maintenance: Safety of Coaches and Wagons is more Shop-based and process-based, unlike Permanent Way or Signals, where safety is Inspection-based. IOH of rolling Stock too plays a role. This is because in a moving asset time available for safety inspection is infrequent. In most cases maintenance and inspection of Rolling Stock is diffused over many locations and authorities.

2.1. Mainline coaches do thousands of kilometres before they are looked at by maintenance personnel. This includes inspection on pit lines or washing lines, at Platforms for PFTR rakes and Rolling-in Examination. They will be examined one by one:

2.2. Pitline Examination: Most pitlines are in a pathetic condition. It is common to find staff walking in knee deep stagnant water in the pit to do a safety examination. It is also common to find toilet drippings falling on their faces and body during the process. Pitlines are often dark, even during daytime due to non-provision or non-working of pit lights.

2.3. Recommendations:

2.3.1. All pits to be provided with steel grates on the floor so that the artisan does not walk on muck and faeces. Designs exist for the same. Side walls of the pitlines should be lined with stain resistant tiles. [CAMTECH to design: two months, Zonal Railways to implement: one year]

2.3.2. All pits to be provided with low voltage, energy efficient, bright LED lights. Lights should be directed upwards so that the undergear is illuminated. Low voltage is necessary to prevent electrocution. [Zonal Railways: six months]
2.3.3. All pit lines to be provided with self-starting diesel powered pumps in case of water accumulation. Diesel pumps are necessary to prevent electrocution. [Zonal Railways: six months]

2.3.4. All new pitlines and those to be repaired should be done like the pitless design of Hubli/Siliguri Diesel sheds. These are built to best international practices and provide easy visibility for safety check as well as for movement of men and material. [CAMTECH to design: three months, Mechanical Coaching Directorate: Policy in six months, Zonal Railways to implement: five years]

2.3.5. All future pitlines and those being renovated/expanded should be built for all-weather use, i.e. with a cover shed and adequate provisions for lighting, drainage etc. [CAMTECH to design: three months, Mechanical Coaching Directorate: Policy in six months, Zonal Railways to implement: five years]

2.3.6. Catwalks in Coaching Depots are made of RCC. Due to constant flow of water and movement of material they begin to crumble in just a few years. All new catwalks and those to be repaired should be made of steel grating in single cantilever design. This will be easy and fast to construct, cheaper, more durable and user friendly. This design will not block light from the pits and undergear. It will also permit free and safe movement of men and material. Design can be adopted from the catwalk in Loco Frame Shop of DLW. [CAMTECH to design: two months, Mechanical Coaching Directorate: Policy in three months, Zonal Railways to implement: three years]

2.3.7. LHB rakes require straight pitlines. This should be kept in mind for all new pitlines and those being converted for LHB. [Mechanical Coaching Directorate: Policy in three months, Zonal Railways to implement: three years]

2.3.8. Tools and equipment for train examination should be standardised and issued to each staff member with personal lockers too allotted to each person for safekeeping. Standard list of common and personal tools need to be made and tools procured for TXR and TL Staff. [CAMTECH: standardise in three months, Zonal Railways to implement in one year]

2.3.9. These recommendations should also should also apply with appropriate modifications to Car Sheds and DEMUs Sheds. [CAMTECH to design: two months, Concerned Board Directorates: Policy in three months, Zonal Railways to implement: three to five years]

2.3.10. **Automatic Coach Washing Plants** must be installed in each Coaching Depot with holding of 300 or more coaches. This not only saves water, but improves turnaround time and prevents flooding of train examination area, thus directly improving safety. [Mechanical Coaching Directorate: three years]

2.3.11. Pit Examination should ordinarily not take more than four hours. Necessary tooling and outsourcing to achieve this should be done. [Mechanical Coaching Directorate to issue policy: three months, Zonal Railways to implement: one year]

2.3.12. Capacity of Pit Lines to examine rakes should be possible over the entire 24-hour cycle. [Mechanical Coaching Directorate to issue policy: two months, Zonal Railways to implement: six months]

2.3.13. **Dashpots in ICF Coaches** do not retain oil and fail to perform their basic function of damping. Friction snubber designs are under trials for over a decade. This should be finalized and directives issued within three months to install them on all ICF
coaches within three years. (Kh I 29.1) [RDSO to finalise: three months, Zonal Railways to implement: three years]

2.4. **Rolling-in Examination**

2.4.1. Rolling-in examination is one of the most effective steps, and often the last step, for catching unsafe situations in trains. TXR staff sits by the side of the tracks and carefully watches as a train rolls-in to a stop at a station. This is done at nominated stations at intervals of say 300-400 km.

2.4.2. As 30kmph turnout are being introduced, the speed of trains at stations is increasing (as compared to earlier 15kmph turnouts). This makes the job of the TXR staff very difficult and misses are entirely possible now.

2.4.3. **Recommendations:**

2.4.3.1. Proper Rolling-in Examination huts to be built to protect the TXR staff from weather. Salem Division’s designs can be adopted. [CAMTECH to finalise Design: three months, Zonal Railways to implement: one year]

2.4.3.2. Bright, light-weight and energy efficient LED lights to be introduced in place of the present design of clumsy, heavy lights. [CAMTECH to design and advise: one month months, Zonal Railways to implement: six months]

2.4.3.3. A switch to Machine Vision Systems with Automatic High Definition Camera and Artificial Intelligence based fault detection and recording system to be introduced. They should also keep a permanent record of what has been examined. (K 4.8) [Mechanical Development Directorate: Design and Policy: six months, Zonal Railways to implement: three years]

2.4.3.4. Such Automatic Machine Vision Devices as above should also be introduced in pitlines to examine the undergear as trains are placed on them. [Mechanical Development Directorate: Design and Policy: six months, Zonal Railways to implement: three years]

2.5. **Empowerment of SrDMEs and CDOs (K 2.9)**

2.5.1. A typical SrDME in a metro city handles nearly two to three lakh bedsheets, half as many blankets, pillow covers and hand towels. This figure is larger than the largest hotel chain in all its facilities put together across the world! His distribution and collection system surpasses that of any hotel chain.

2.5.2. This is an area that attracts maximum passenger complaints and therefore takes up most of the time of the SrDME. It is generally on account of linen, liquid soap, cleanliness etc. that a SrDME is questioned and naturally he/she spends most of the time and management effort in this area putting safety on the back burner. This is a stark reality. Failure of a contract, in such areas, creates a situation where no fallback arrangement exists given the volume and geographical limitations.

2.5.3. SrDMEs and CDOs have a Cash Imprest of ten thousand Rupees or similar sums. This is about the same as some other officers have for office use, for buying stationery and ink cartridges. A SrDME needs to buy essential safety and passenger amenity items on short notice, often to release a rake or a coach the same day. Cash Imprest is the most effective and fastest way to meet the needs of Safety and Passenger Amenity.
2.5.4. The SrDME has now also been given additional charge of Environment and Health Management (EnHM), which includes cleaning of stations, platform tracks etc. This will further erode his attention to safety issues.

2.5.5. In most cases the same SrDME also looks after Freight Train operations.

2.6. Recommendations:

2.6.1. A new post of SrDME (Passenger Amenities) should be created in every Division, 68 in all, to exclusively handle Passenger Amenity and EnHM to ease the work of the main SrDME, who should devote his attention exclusively to Safety issues. [EnHM Directorate: six months]

2.6.2. The Cash Imprest of each SrDME, in charge of train maintenance and passenger amenities (including EnHM) should be increased to Rs. 10 lakh, and the SrCDO/CDO to Rs. 5 lakhs to be recouped every month. Recoupment should be automatic every month by recharging a prepaid card. Account of the previous month may be sent separately. [Finance Directorate: three months]

2.6.3. A SrDME and SrCDO/CDO should be permitted to buy stock or non-stock items, without any restrictions, out of this Cash Imprest. [Finance Directorate: three months]

2.6.4. These recommendations regarding Cash Imprest should also apply to SrDEEs in charge of Car Sheds and Loco Sheds and SrDMEs in charge of DEMUs and Loco Sheds. [Finance Directorate: three months]

2.6.5. Rule 145 of the GFR 2005 for purchase of up to Rs. 15,000 without calling for multiple quotations should be made immediately applicable in Railways. [Finance Directorate: three months]

3. Coach Design and Deployment

3.1. ICF coaches were not originally designed for high-speed long-train operations the IR now demands from them. Modifications to the original design have enabled these coaches to serve somewhat satisfactorily so far, but they have now reached the limit of their capabilities. The LHB Design delivers a much safer passenger coach. (K 4.2.3)

3.2. It is believed that ICF is in a position to make a complete switch to LHB w.e.f. Year 2018-19. RCF should be asked to make a compete switch w.e.f. 2018-19, if not earlier. MCF is already an LHB-only plant.

3.3. LHB, though robust and much safer than the ICF (Originally Schlieren), it is not a certified crashworthy coach. A design has already been developed of a crashworthy design on the LHB platform, which was never proliferated. This will go a long way in developing a safe high-speed train system with purely Indigenous efforts.

3.4. A quick solution to the problem of jerk in Coaching CBCs should be found in six months, even if we have to adopt proprietary designs. Without this solution, proliferation of LHB and CBC-ICF Coaches will meet with stiff public resistance and ridicule.

3.5. Recommendations:

3.5.1. ICF should stop manufacture of ICF Design coaches w.e.f. 01-04-2018 and RCF from 01-04-2019 and completely switch to LHB production for IR. MCF is already
making LHB coaches to its entire capacity. (CSP 9.1) [Mechanical PU Directorate to issue policy: three months]

3.5.2. Only Trains with LHB Coaches should run at speeds higher than 100kmph and in compositions of over 18 coaches. (K 9.5)

3.5.3. The crashworthy design of LHB needs to be [Mechanical Coaching Directorate to issue policy: three months] revived and studied for adoption in new manufacture by 01-04-2021. [RDSO to finalise: six months]

3.5.4. All ICF coaches should be equipped with CBC. Though not a substitute of an LHB design, CBCs on ICF are an established safer design. Energy absorption elements should necessarily be built into ICF coaches for this purpose. (K 4.2.5.3) [Mechanical Workshop Directorate to issue policy: three months]

3.5.5. Non-CBC ICF coaches, in the interim, should be used only in branch lines with not more than 14-15 coaches and speeds not more than 90kmph. (K 9.5) [Mechanical Coaching Directorate to issue policy: three months]

3.5.6. Codal Life of ICF Coaches to be reduced to 20 years. MLR to be done after 9-10 years. [Mechanical Coaching Directorate: three months]

3.5.7. All Corrosion Repair Shops should be audited by RDSO vis-à-vis their shop practices, material procurement systems, welding, skills and training needs. [Mechanical Workshop Directorate: three months]

3.5.8. Corrosion Repair of Coaches should be done with flux-cored MIG Welding wires only. Solid wires do not provide necessary flux for cleaning of dirty and corroded surface. This should be introduced within next six months. [Mechanical Workshop Directorate to issue policy: one months]

3.5.9. The proposed MLR Workshops should be commissioned within the next one year. [Mechanical Workshop Directorate: one year]

3.5.10. Mail Express Trains with ICF composition should not have any coach older than 8-9 years from the initial build, after which they should be relegated to branch lines and lower-speed, shorter-length operations till the MLR. Additionally, ICF coaches fresh out of MLR can be deployed in such trains for 5-7 years. [Mechanical Coaching Directorate to issue policy: three months, Zonal Railways to implement: one year]

3.5.11. Possibility to provide 8mm sole bar in passenger carrying ICF vehicles should be examined as is done in OCVs within three months. If its manufacturability and retrofit possibility is established, it should be done in all MLR coaches starting within six months. [Mechanical Workshop Directorate: six months]

3.5.12. Trains with ICF coaches should not be longer than 18 coaches and speedier than 100kmph. They were never designed to absorb such high kinetic energies in cases of crash and that is the reason they completely disintegrate in accidents. (K 4.2.1 and 4.2.5.4) [Mechanical Coaching Directorate to issue policy: three months, Zonal Railways to implement: one year]

3.5.13. All ICF coaches older than 7-8 years and 5 years after MLR should work only in branch lines with not more than 14-15 coaches and speeds not more than 90kmph. These steps will mean some short-term loss of capacity, which should soon be overcome with faster induction of LHB coaches in large numbers ex-ICF, RCF and
MCF. [Mechanical Coaching Directorate to issue policy: three months, Zonal Railways to implement: one year]

3.5.14. There should be a complete ban on introduction of new trains so that the entire production of LHB Coaches go into replacement of ICF coaches in long-formation and Mail Express Trains. [Traffic Coaching Directorate: immediate]

3.5.15. The problem of jerk in the CBC of LHB remains unsolved. This needs to be done on top priority to make these coaches acceptable to travelling public. All new manufacture and retrofits should be with suitable draft gear. (K 4.2.5.2 and CSP 9.2) [Mechanical Coaching Directorate: six months]

3.5.16. Airbag pneumatic suspension should be pursued with earnestness in LHB coaches so that GS-type coaches, which have widely varying loads, become suitable for deployment. [Mechanical Coaching Directorate: one year]

3.5.17. A permanent solution to wheel shelling on LHB Coaches must be found within a year. [Mechanical Coaching Directorate: one year]

4. A Completely ICF-Design-Free Regime

4.1. In order to completely eliminate ICF coaches, a design older than seventy five years, it is necessary to take a holistic view of passenger vehicles. Self-propelled vehicles should be used more and more for short distance services. These trains have higher seating capacity, benefit from better acceleration, do not need engine reversal and therefore decongest platforms and yards enhancing safety all around. They also have the advantage of having EP Brakes, which ensures uniform braking, shorter braking distance and time, thereby improving average speeds.

4.2. Even the LHB is a four-decade old design and cannot be relied upon for serving our long term needs, which must increasingly be served by train-sets or self-propelled stock.

4.3. Recommendations:

4.3.1. All short distance trains, up to 500km, should switch to self-propelled stock. [Railway Board to issue policy: six months, Implementation: ten+ years]

4.3.2. The existing capacity of ICF or RCF may not be able to provide enough self-propelled stock and certainly not of a contemporary design. Hence, it is necessary that a fresh look at the product-mix of the proposed Kanchrapara Factory be given quickly. This may be aimed at relieving ICF, RCF and MCF to manufacture only or largely LHB. KPA should be exclusively a high-speed/semi-high-speed self-propelled coach manufacturer. [Mechanical Coaching Directorate: three months]

5. Fire in Passenger Trains (CSP 4.4)

5.1. It is a reality that when a coach catches fire it is generally completely gutted. It is learnt that fire retardant and low-toxicity materials are already in use in passenger coaches. Even with fire retardant furnishings, curtains, linen, rexine and foam, the coach ends up being completely destroyed. Our efforts must, therefore, be to gain extra few minutes, before the compartment is engulfed in flames, so that passengers can escape to the next coach or alight.
5.2. **Recommendations:**

5.2.1. Aisle curtains in 2AC coaches should be removed as already done in 3AC. [Mechanical Coaching Directorate: three months]

5.2.2. There should be at least four emergency exit windows in each coach marked by illuminate/fluorescent borders. The coach floor should have illuminated/phosphorescent guiding lights to help passengers exit in case of fire and accidents. [Mechanical Coaching Directorate: two years to implement in all coaches]

5.2.3. Possibility of exit rope, ladders or ramps at such windows to be explored in next three months. (K 4.6.5) [RDSO: six months to design]

5.2.4. All mobile phone charging points should be USB sockets only, with 5 volts supply. This will prevent passengers from using the 110V sockets for heating water and milk for babies or making tea for themselves. Cases of fires due to such acts have been reported. [RDSO: three months to design, Zonal Railways and PUs: one year to implement]

5.2.5. If we must provide sockets for charging of laptops, their numbers should be limited and protected by a 500mA fuse. [Zonal Railways: six months]

5.2.6. Electric sockets in toilets for use of electric razors in LHB Coaches should be removed. With battery-powered shavers now available, such sockets have outlived their utility. [Zonal Railways: six months]

5.2.7. Electric cables, fittings, fuses, circuit-breakers etc. for use in coach should be procured from a list of approved reputed vendors, not more than five in each case. [RDSO to issue revised list of approved vendors: three months]

5.2.8. Each passenger bay in the coach should be provided with a suitable fire-extinguisher within easy reach of passengers. An alert passenger may be able to use it and douse an early fire. [Mechanical Coaching Directorate: six months]

5.2.9. Modified Fuse Distribution Board should be universalised within the next one year. [Mechanical Coaching Directorate: six months]

5.2.10. There should be no cooking permitted whatsoever in Pantry Cars. LPG Cylinders should be banned in Pantry Cars. Heating if any, of precooked food, should be done on induction ovens only. It will require an iron-fist to enforce it. (K 4.7.3) [Commercial Catering Directorate: three months]

6. **Freight Trains and Safety Issues**

6.1. Equipment failures on freight stock are primarily Hot Axles, Flat Tyres, Hanging Parts, Bearing Failures, Train Partings and Detachments. Out of these Hot Box is a condition that may lead to immediate unsafe situations.

6.2. Annexure – 4 gives distribution of major wagon defects for different levels of certification of freight rakes. It is clear that CC Rakes offer much higher reliability in operations.

6.3. CC Rakes have proven their worth not only by increased availability for traffic, but also by increased safety. It was learnt from EDME/Frt that Premium Rakes (lower levels of certification) account for about 25% of all Freight rales, yet they contribute
over 50% of bearing failures. There is a clear case for proliferation of CC Rakes, which account for 50% of all freight rakes and deliver reliability four times that of lower certification rakes.

6.4. Train partings can be nearly completely eliminated if the Newly Developed Couplers to RDSO Specifications WD-70 are properly procured and maintained. It appears that replacement parts of new couplers are being procured to old specification WD-48 on account of high costs.

6.5. **Recommendations:**

6.5.1. The Coupler Specification WD-48 BD08 should become obsolete w.e.f. 01-01-2017. No coupler or its components should be procured to this specifications. [RDSO: immediate]

6.5.2. All Wagon Couplers and Draft Gears should be procured to RDSO Specifications ED-70 and WD-71 respectively only w.e.f. 01-04-2017. [Mechanical Coaching Directorate: three months]

6.5.3. RDSO should carry out a rate analysis for the new coupler and its components so that purchase decisions are facilitated in the field. [RDSO: three months]

6.5.4. Low torque grease seals should be introduced for CTRBs of Wagons to control temperature rise in the bearings on the run. [Mechanical Freight Directorate: three years]

6.5.5. Induction of zero-torque grease seals should be examined by RDSO and advised to Railway Board with cost-benefit analysis so that a decision can be taken on their eventual induction. [RDSO: one year]

6.5.6. Population of CC Rakes should be increased to 70-75% of all freight rakes. This should be done in one year. (CSP 6.44) [Traffic Transportation Directorate and Mechanical Freight Directorate: one year]

6.5.7. CAMTECH should be asked to audit a few CC Rake Depots and suggest steps to be taken to augment them for increased population and improvement of quality. [CAMTECH: three months]

6.5.8. Infrastructure of CC Rake Maintenance Depots to be strengthened on the basis of CAMTECH audit. A onetime sanction of Rs. 500 Crores should be given for this purpose, to be spent over next three years. [Mechanical Freight Directorate: three years]

6.5.9. Twin-pipe operations should be universalized and any deviation should require orders from Zonal Head Quarters for continued Operations. [Mechanical Freight Directorate: three months]

7. **Wagon Design:**

**Wagon Designs have remained stagnant as far as safety is concerned. In spite of intent of High Axle Load Designs to be designed by Experts and induction of Track Friendly Bogie, progress is slow on these fronts.**

7.1. **Recommendations:**

7.1.1. All new wagon procurement should be procured with 25 Tonne axle load capacity. This may add to the cost of acquisition only marginally, but make all these wagons
compatible and interchangeable with DFCs. [Mechanical Freight Directorate: six months]

7.1.2. The matter of smaller wheel dia of 840mm necessary for 25T wagons and its implications should be entrusted to an IIT for resolution. This is a project, which needs to be pursued not only for safety, but also for the financial health of Railways. To be resolved in six months. [Mechanical Freight Directorate: six months]

7.1.3. Track Friendly Bogies for Wagons is an old project, but still has to see the light of the day. A design should be finalized in next six months and induction planned w.e.f. 01-04-2019. (K 4.10.2 and CSP 6.40) [Mechanical Freight Directorate: six months]

7.1.4. Goods Guard Vans must be made user-friendly with lights, fan and comfortable furniture. A rechargeable battery of adequate capacity too should be provided to cover prolonged halts. This battery may also power the EOTT Device. This should be completed within one POH Cycle, i.e. four years. (CSP 7.22) [Mechanical Freight Directorate: four years]

7.1.5. IR must eventually plan to do away with guards completely. [An action plan to be prepared by the Traffic Transportation Directorate: six months]

8. Workshops

8.1. Workshops play the most important role in building safety into Rolling Stock. Since Workshops are “back-offices” of Indian Railways, they do not attract the same level of management attention like passenger amenities, station-cleanness-campaigns, linen or catering. This needs to be corrected at the systemic level by empowering the Workshop management, which can then independently operate without seeking senior management’s intervention at every stage.

8.2. A well laid-out, adequately-equipped, clean, safe and hygienic Workshop is essential for good quality work on rolling stock. CWMs have to look up to DRMs even for small and minor attention to their workshop structures, floors, buildings, drainages, toilets, pit-lines, lighting, telecommunication, networking etc. In spite of a JPO signed by the MM and ME over a decade ago, CWMs have not been empowered for engineering maintenance at their level.

8.3. Traditionally, Chief Workshop Managers (CWMs) had enjoyed the same level of delegation in the Schedule of Powers as DRMs. Increasingly, due to the limelight on DRMs, the delegation to DRMs has been steadily enhanced and there has come about a disconnect between the two authorities, viz. CWM and DRM.

8.4. Recommendations:

8.4.1. All the powers of CWMs, for Sanction of Works, Sanction of Estimates, Tendering and Contracting, Re-appropriation etc. should be brought at par with the DRMs. These should be automatically linked to the DRMs’ powers for future enhancements. Needless to say, such delegations will be done only in areas relevant to the functioning of CWMs. [Mechanical Workshop Directorate: three months]

8.4.2. Mere empowerment is not enough though. Funds should be made available to the CWM to carry out these jobs. Since maintenance of Workshop assets as referred
above is essential for proper maintenance of Rolling Stock, it would be appropriate that their upkeep too is charged to WMS, which will eventually reflect in the cost of repairs and POH. CWMs should be empowered to spend on activities as mentioned above out of the Workshop Manufacturing Suspense (WMS). [Mechanical Workshop Directorate: three months]

8.4.3. CWMs must be empowered to spend up to 2% of their annual budget on meeting such needs for the Workshop. CWMs should be the final authority for all such expenditures out of WMS. [Mechanical Workshop Directorate: three months]

8.4.4. Quality of Workshop’s Output: Each Workshop will have as an associated Inspector a JAG/SG Officer of the Headquarters, who will carry out periodical or sample checks of the quality of output from each workshop. Such Inspectors should be nominated within next three months for all Workshops of Mechanical, Electrical, S&T and Engineering Departments. [Mechanical Workshop Directorate: three months]

9. Ancillarisation of Workshops

9.1. Workshops should concentrate on core activities. For example, Core activities of a Coaching workshop are incoming and outgoing inspection, coach lifting, bogie-shop, corrosion repair, wiring and harnessing, fitting of sub-assemblies in the coach and their inspection. They have a huge pool of man-power, a significant part of which is often employed in non-core activities, such as electroplating, repair of subassemblies such as Distributor Valves, Shock Absorbers, Bearings, Fans, Painting, Air-Conditioning units, Trimming (furnishing and repair of berths and seat cushions) etc.

9.2. The population of Coaches, Wagons and Locomotives will steadily increase and since it will neither be possible nor advisable to increase the manpower commensurately, it is necessary to redeploy the manpower employed in non-core activities to core activities. There is no other way productivity and quality of Workshop activities can be improved.

9.3. CWMs should be empowered to outsource such activities as identified as non-core on a long-term basis. For example, a bearing company or a traction motor OEM can be given a ten-year contract to set-up facilities within the workshops or adjoining it. Such a model already exists in the shape of BOOT laundries. What we have done for a passenger amenity item needs to be replicated for safety items too.

9.4. These facilities should be used only for repair and maintenance.

9.5. Such long-term lease and contract has many benefits:

9.5.1. It releases the executive from repeated exercise of annual contracting and allows him/her to concentrate on his main job.

9.5.2. It encourages the successful bidder, the OEM of major sub-assemblies, to invest in equipment, manpower, training and back-to-back sourcing of parts and services. This improves quality, delivery times and reduces costs.

9.5.3. It is expected that for a ten-year or longer contract and an assured business to the contractor, IR can reduce costs by up to 20% to begin with. This is the model that ensures quality, timely delivery and low costs for car manufacturers.
9.5.4. An ancillary setup like this will be open to periodic inspection by the Railways. A minimum service level agreement should be built into such contracts. Quality and Quantity Level Assurance should be an integral part of such contracts.

9.5.5. An ancillary set up in one Workshop will serve many other workshops for the same make of subassembly, thus making it a viable business for the contractor too.

9.6. **Recommendations:**

9.6.1. Each Department (Directorate in The Railway Board) that controls Workshops (Mechanical, Electrical, S&T and Engineering) will identify non-core activities that should be outsourced on a long-term basis. (Kh I 2.17 and K 2.11.5) [Mechanical Workshop Directorate to coordinate: three months]

9.6.2. A separate schedule of powers for outsourcing and terms and conditions for such long term contracts will be prepared for uniformity. CWMs will be fully empowered to enter into such contracts. [Mechanical Workshop Directorate to coordinate: three months]

9.6.3. Similar delegation of powers should also be done for SrDMEs and SrDEEs in-charge of Train Maintenance, Coaching Depots, Car Sheds, DEMU Sheds and Loco Sheds. [Concerned Board Directorates: three months]

10. **Locomotives**

10.1. Locomotives require best maintenance attention compared to other rolling stock since they are smaller in number and are homed in a shed, headed by a senior officer. Yet, safety issues spanning diesel and electric traction need to be addressed in a holistic fashion. Uniform design of loco cabs has been attempted for years. This idea needs to be revisited and uniformity of loco cabs, separately across Diesel and Electric Locomotives should be studied afresh. Electric Locos may require further division between conventional locos and 3-phase ones.

10.2. It is important that location of various safety devices used by the loco pilot – like the A9, SA9, Speedometer, VCD reset button, Assistant’s Emergency Braking Switch, Hand Brake Operating Device, Various Cutout Cocks are at identical locations in one type of locomotives.

10.3. **Recommendations:**

10.3.1. Loco and Motor Cabs should be equipped with Audio-Visual Recorders like the cockpit. LPs and ALPs should be provided with noise-cancellation headphones for communicating with each other. [Electrical RS and Mechanical Traction Directorates: two years]

10.3.2. If the VCD of a loco fails, the loco should be declared dead after clearing the block section. [Electrical RS and Mechanical Traction Directorates: one month]

10.3.3. All loco cabs should be air-conditioned. New locos should be turned out with air-conditioning and old ones should be retrofitted within one POH Cycle. (Tripathi 9.75) [Electrical RS and Mechanical Traction Directorates: four years]

10.3.4. An ergonomic design for the seats of Loco Crew and of Motormen should be developed with international standards and installed within next one year. [Electrical RS and Mechanical Traction Directorates: one year]
10.3.5. Crew Friendly Cab has been an on-going exercise. All locos that have not been provided with crew-friendly cabs should be modified within next five years. (CSP 4.3 and 7.19) [Electrical RS and Mechanical Traction Directorates: five years]

10.3.6. A final view on uniform design of loco cabs must be taken within three months and policy directives issued. All cabs should be converted into the standardized ones within the next POH cycle. (K 6.4) [Electrical RS and Mechanical Traction Directorates: five years]

11. Testing of Rail Vehicles

11.1. Indian Railways is the only major railroad in the world that does not have a dedicated test track of its own. As a result, all vehicle testing is done on running tracks. Not only does it affect train operations, the trials are often inadequate due to paucity of traffic blocks. Besides, the rail vehicles are not subjected to simulated track conditions as possible on a test track. This is unavoidable due to ever changing nature of rolling stock, both external and interiors.

11.2. Additionally test of various track designs and fittings is not possible at all since test conditions cannot be created on a running track.

11.3. There is no dedicated crash testing site and physical simulation facilities for testing crash worthiness of rail vehicles.

11.4. Recommendations:

   11.4.1. Plan and specifications for a Dedicated Test Track should be finalised in consultation with the Pueblo Research Centre within next one year. Sanction for the same already exists. [Mechanical Traction Directorate: one year]

   11.4.2. The Dedicated Test Track, on the lines of one in Pueblo, USA should be built within next five years. (Kh II 5.21.2) [Mechanical Traction Directorate: five years]

   11.4.3. IR should consult research agencies in Europe, Japan and USA to develop specifications and layout of a crash test facility and protocols within the next one year. (Kh II 5.15.5) [Mechanical Coaching Directorate: one year]

   11.4.4. A crashworthiness testing lab/facility should be built within the test track within the next five years. [Mechanical Coaching Directorate: one year]

12. Derailments

12.1. Derailments are increasingly being attributed to rail-fractures and weld failures. There is a need to address the backlog in rail/track renewals and the technology of rail welding. Inspection of Rails is a complex exercise and must be automated as much as possible to reduce dependence on human judgement.

12.2. Recommendations:

   12.2.1. Backlog of rail renewals, deep screening, de-stressing, renewals of Crossings, Welds, glued joints etc. must be taken up on topmost priority overcoming all constraints of budget. [Track Directorate: three years]
12.2.2. Replacement of Defective (D-Marked and others) rails should be the top most priority for IR and should rank higher than new lines, doubling, gauge conversion etc. [Track Directorate: five years]

12.2.3. Mission Zero-Missing-Track-Fittings must be pursued in right earnest and fulfilled. [Track Directorate: six months]

12.2.4. All future procurement of rails for all new line, doubling, gauge conversion and programmed rail renewal should be 20-rail panels using 65m or 130m rail, flash butt welded at rail manufacturers’ factory. [Track Directorate: one year]

12.2.5. Rails should be galvanised or painted with anti-corrosion paint at the manufacturers’ factory before despatch. [Track Directorate: one year]

12.2.6. In-situ Rail Stress Measurement Devices to be acquired for checking stress in LWRs and taking preventive action before rail fracture or rail buckling happens. A limited number, one for each Zonal Railway to be acquired in next two years and then for each Division over next five years. (Kh II 5.20.3) [Zonal Railways: two years]

12.2.7. Need for special wagons for such transportation of long rails and long panels must be ascertained in next three months and wagons acquired within next one year. [Mechanical Freight Directorate: one year]

12.2.8. Scabbing of Rails must be avoided at all costs as scabbed rails are not immediately attended even though they are known to develop sub-surface cracks, ultimately leading to rail-fracture. For this purpose, the Load Tables for all sections must be reexamined by a committee of CFTM, CELE, CTE and CRSE in each Zonal Railway suitably powering of trains mentioned in the WTT. [Zonal Railways: three months]

12.2.9. Rail Grinding must be put on a sound footing, if necessary by acquiring additional machines on OPEX Model. (CSP 6.21) [Engineering Track Machines Directorate to issue policy: three months, Zonal Railways to acquire: two years]

12.2.10. Track Recording Cars: All Track Recording Cars should be re-equipped with modern systems and laser based sensors for effective measurements and recording of track parameters. This should be done within next three years. (CSP 6.19) [Engineering Track Machines Directorate: three years]

12.2.11. Lubrication of gauge face should be done frequently and without fail on curves, points and crossings, locations having exercise lateral wear, work-sites and on bad formations to prevent climbing of wheel. A directive should be issued within a month. (Kh I 3.8.1 and CSP 5.21) [Zonal Railways: immediate]

12.3. Precautions for Heavy Axle Load Operations: Adequate number of WILDs should be provided. Action on WILD alarms to control excess impact and damage to track to be ensured religiously. Weigh Bridges should be kept in working order at all times. Procedures to handle unweighed or overweight rakes should be followed scrupulously. [Mechanical Development Directorate: three years]

13. Rail Weld Technology: Even with longest rail panels some welding in the field cannot be avoided. Besides, replacement of rails in the field too require in situ welding. AT Welding is still used in modern railroads and is unavoidable in certain conditions. There is,
however, a need to not only improve welding techniques, but also induct modern technology to ensure safety.

13.1. **Recommendations:**

13.1.1. A study should be commissioned to upgrade IR’s AT Welding Techniques to the best in the world, viz. ENI 14730-1 or later standards. (K 5.3, Kh I 15.7 and CSP 5.19c) [Track Directorate: six months to begin study, one year to finalise]

13.1.2. **Consumables for AT Welding** must come from proven sources. The manufacturers of such consumables should also be subject to process control and quality audits, which must be quickly laid down by RDSO with expert help. [RDSO: six months]

13.1.3. **Additional sources for AT Welding consumables** must be pro-actively developed to bring competition in the market. This will go a long way in ensuring quality, timely deliveries and reasonable prices. [RDSO: six months]

13.1.4. **Flash Butt Welding** is a reliable technique, not only for welding in the plants, but also in the field. Each Division must be equipped with a mobile Flash Butt Welding Machine within the next three years. (K 5.3 and CSP 5.19d) [Track Machine Directorate: three years]

13.1.5. **Training of Officers and Supervisors:** Engineering Officers and PWay Supervisors must be given a specialised training in Rail Welding Technology with lab-work in appropriate Training Institute within Railways or Outside. If necessary, specialised training centres must be set-up for this purpose within next three years. [All Departmental CTIs: one year]

13.1.6. **Training of Welders:** Formal training programmes along with lab-work should be designed for Welders in the field. Annual refresher course and annual certification for such Welders should be made mandatory. [IRICEN to coordinate and plan: three months]

13.1.7. **Traffic Block for Welding of Rails** should be of minimum 70 minutes so that Welding is properly cured. This must be ensured even at the cost of punctuality and throughput. A corridor block of 75 minute should be built for each section in the WTT for this purpose. [Zonal Railways: immediate]

14. **Ultrasonic Flaw Detection**

The current technique of USFD is neither adequate nor is it user friendly. It leaves blind area in the cross-section and the current technique causes fatigue in the staff carrying out the inspection, thus further impacting its effectiveness.

14.1. **Recommendations:**

14.1.1. The existing Trolley Mounted USFD Machines are too dependent on human interpretation of defects. New machines need to be procured, which detect a flaw and record the location of the flaw along the track. [Track Machine Directorates to issue technical specifications: three months, Zonal Railways to acquire: one year]

14.1.2. Vehicle Borne USFD testing for rail and weld inspection, to be inducted, one for each Zonal Railway within next two years. (K 5.2.5.5 and Kh I 2.20.6 iv). OPEX
model of acquisition of such devices should be adopted. [Track Machine Directorate to issue policy in three months]

14.1.3. General Managers should be authorized to acquire one such system each so that large scale trials can be quickly conducted and concluded. [Zonal Railways: two years]

14.1.4. Number of Vehicle Borne inspection devices to be increased to one in each Division within next five years. [Track Machine Directorate to issue policy: three months, Zonal Railways to acquire: five years]

15. Broken Rail Detection System

15.1. The ongoing trials of Ultrasonic based realtime broken rail detection system on 25km stretches in underway on NR and NCR. Trials should be expanded to five other locations and concluded within a year. [Track Directorate: one year]

15.2. If found successful, this system should be adopted and proliferated across entire IR within next five years. [Track Directorate: five years]

16. Bridges

16.1. Renewal of Bridges has been an area of focus for a long time. This was given a renewed thrust in the Corporate Safety Plan and was funded by the SRSF. However, induction of modern technology has been sporadic at best. The Corporate Safety Plan laid great emphasis on this. (CSP 5.25)

16.2. Recommendations:

16.2.1. A full-fledged Bridge Management System, standalone of as a part of the TMS should be created within the next one year. [Track Management Directorate: one year]

16.2.2. Rehabilitation and strengthening of bridges for 25 tonne axle load to be completed on priority. [Bridge and Structures Directorate: five years]

16.2.3. Replacement of corroded steel and concrete girders with anti-corrosive measure in corrosion-prone area. [Bridge and Structures Directorate: five years]

16.2.4. The project of instrumentation of major bridges for online monitoring has been abandoned. This should be revived immediately and installed on 200 major bridges as planned earlier. [Bridge and Structures Directorate: three years]

16.2.5. A scientific and proven system of inspection of underwater portions of bridges should be developed, with expert help, within next one year. IIT-Madras has done work in this area. They should be consulted. [Engineering Bridge and Structures Directorate: one year]

16.2.6. Mobile Bridge Testing Labs, on the lines of Emission Test Car of RDSO should be developed. At least five of these should be inducted within next three years. [Bridge and Structures Directorate: three years]

16.2.7. Mobile Bridge Inspection Units should be inducted with modern techniques. One for each Zonal Railway within next five years. [Bridge and Structures Directorate: five years]
16.2.8. Drones with Ultra High Definition Machine Vision should be designed within next one year on commercially available drone platforms within next one year. A drone for each Division should be acquired within next three years. These should work in synergy with the Mobile Bridge Inspection Units. [Bridge and Structures Directorate: one year]

16.2.9. Tractive Effort limiting devices should be a standard feature in all locomotives. [Electrical RS and Mechanical Traction Directorates: two years]

17. Maintenance of Engineering Assets

17.1. Traffic Blocks: Engineering assets, like tracks, bridges and tunnels often require extended traffic blocks, manpower and track machines as well as ETA for proper maintenance.

17.2. Recommendations:

17.2.1. Dedicated Maintenance Block on all routes for at upto three hours should be given by the DRM, without referring the matter to Headquarters. If necessary, trains to be cancelled, rerouted or regulated. The ETA will accordingly be revised for each section. All maintenance backlog for tracks should be wiped out in one year. (CSP 6.24 and 6.25) [Zonal Railways: one year]

17.2.2. Blocks will be in the nature of integrated corridor blocks to be utilized for Engineering and TRD assets. As far as possible, S&T Maintenance should also be combined within these blocks. [Zonal Railways: one year]

17.2.3. The authority seeking block will clearly specify, in advance, the quantum of work that will be carried out during the block period. This should be a verifiable volume of work. [Zonal Railways: one year]

17.2.4. DRM’s performance will be evaluated on the hours of block granted and output delivered as per standardized norms. [Zonal Railways: one year]

17.2.5. Before a traffic block is granted, the Sectional SrDEN/DEN will certify that all material, equipment and manpower for the work to be done during the block has been arranged. [Zonal Railways: one year]

17.2.6. A Special allowance of 30% should be given to Keymen and Gatekeepers, currently unpopular categories, so that we get willing and sincere staff for manning these important posts. [Track Directorate: three months]

17.2.7. Vacancies of Trackmen should be filed on top priority in a time bound manner.

17.2.8. There is an urgent need to take a new look at the tools and equipment of the Keyman to make his job easier, more hands-free and less tiring. [Track Directorate: three months]

17.3. Empowerment of SrDENs/DENs (K 2.9)

17.3.1. A typical Sectional SrDEN/DEN is constantly struggling to meet even basic material requirements of the field. Most procurement is centralized in the Headquarters. This often results in sub-standard or incomplete work even when a long traffic block is granted ultimately leading to frequent demands of blocks.

17.3.2. The urgent needs of the field are best met by the officer facing it directly, day in and day out.
17.4. **Recommendations:**

17.4.1. Sectional SrDENs and DENs should be given a Cash Imprest of Rs. 10 lakh, to be recouped every month. Recoupment should be automatic every month by recharging a prepaid card. Account of the previous month may be sent separately. [Finance Directorate: three months]

17.4.2. A SrDENs or DENs should be permitted to buy stock or non-stock items, without any restrictions, out of this Cash Imprest. [Finance Directorate: three months]

17.4.3. Rule 145 of the GFR 2005 for purchase of up to Rs. 15,000 without calling for multiple quotations should be made immediately applicable in Railways. [Finance Directorate: three months]

17.4.4. Divisions should also be empowered to procure tack fittings like ERCs, Liners, GRSPs and Fittings for Points and Crossings through the Divisional Stores Officer. [Finance Directorate: three months]

17.4.5. **Essential Track Fittings** like ERCs, Liners, GRSPs, Fish Plates, Joggle Fish Plates, SEJs etc. should be made Stock Items and regular procurement made to an established EAR/AAC. [Track and Stores Directorates: three months]

17.4.6. PWIs should have a Cash Imprest of Rs. One lakh for prior cleaning of tracks before maintenance work in undertaken. [Finance Directorate: three months]

17.5. **Upgradation of Track Materials:**

17.5.1. Adoption of superior quality corrosion resistant rails having high fracture-toughness needs to be expedited. [Track Directorate: five years]

17.5.2. Wider and heavier sleepers (already under trial) with improved elastic fastening to be adopted. [RDSO to finalise trials: one year]

17.5.3. **Thick Web Switches** should be installed on all major trunk routes within next three years. (Kh II 4.8.3) [Track Directorate: three years]

18. **Encroachments**

18.1. Encroachments near tracks affect operations and maintenance. Defecation and trespassing affects tracks due to accelerated corrosion. There is a need to fence tracks to prevent these and also to prevent Cattle runover.

18.2. **Recommendations:**

18.2.1. New track works like new lines, doubling and gauge conversion should include fencing in all estimates. [Works Directorate to issue policy: three months]

19. **Protection of Road Users**

19.1. Protection of Road Users at Level Crossing Gates is an avowed objective of the IR. Unmanned Level Crossings (UMLC) are the spots where maximum casualties of Road Users happen. Removal or manning of UMLCs has been undertaken in right earnest. Eventually, though Manned Level Crossing Gates too need to be eliminated to facilitate operations and to eliminate LC accidents due to human error.
19.2. Recommendations:

19.2.1. The mission of elimination of LC Gates should be pursued in right earnest.

19.2.2. A system needs to be devised to periodically open the LC Gates, which are Closed to Road Traffic, so that the accumulated road traffic gets cleared. [Safety Directorate: three months]

20. Signalling

20.1. Safety of Trains depends on Integrity of Signaling Systems. Human interventions should be minimized, if not altogether eliminated.

20.2. In spite of advancement of signaling systems in the world and even on IR, there are nearly 370 stations having Lever-Frames and Semaphore Signals. Similar number of stations have Lever-Frames, equipped with Colour Light Signals.

20.3. The current throw-forward for signal Works in under PH-33 is about Rs. 7800 Crores. This implies a liquidation of these works alone will take 7-8 years at current levels of funds provisions and resources, leave aside investments in Advance Signaling Systems.

20.4. There is a growing backlog of stations, where signaling gears become due for replacement. We are replacing only about 100 stations against an arising of 200 per annum. A glaring example was the catastrophe in Itarsi RRI, which happened due to delay in renewal. A list of Major Yards due for replacement can be seen at Annexure – 5.

20.5. Recommendations:

20.5.1. All Lever- Frames and Semaphore Signaling should be replaced in next three years. [Signal Directorate: three years]

20.5.2. All Relay Rooms of interlocked stations having more than 100 routes should be Air-conditioned, Dust-proofed and fitted with Fire Detection and Dowsing System. [Signal Directorate: three years]

20.5.3. Signal and Telecom Assets are nerve centres of Train Operations. A study should be conducted to evaluate threats of sabotage, terrorist attacks etc. to them and to provide necessary protection. This should be done within next six months in consultation with the RPF to define the security protocol for implementation. [Signal Directorate: six months]

20.5.4. Redundancy must be built/provided for items like BPAC so that in case of failure the backup system takes over in case of failure of one. [Signal Directorate: three years]

20.5.5. Raise standard of interlocking to provide isolation for safe operation and to improve speeds. [Signal Directorate: five years]

20.5.6. All starters at stations should be made free starters so that the need for physically ensuring correct setting of points protected by the signal is not required during failures like block failures. If due to the complexity of the signaling system, a free starter is not possible, a calling-on signal should be provided below the starter so that correct setting and locking of points can be ensured with the clearing of the calling-on signal. [Signal Directorate: five years]

20.5.7. Dual Detection: Redundancy in design is an established Engineering Practice to improve the System Availability for Operational Use at the same time
maintaining the required Level of Safety in Train Operations. This has been extensively used in all critical applications, which includes apart from Satellite Systems, Nuclear Power Stations, Aeronautic Engineering Equipment, the Railway Train Control System. This comment has also been recommended by the Kakodkar Committee vide Para 2.5.3 (Recommendation No.1-2). The system has been deployed on Indian Railways for Fail Safe Train Detection, which forms the base for the Integrity of the Signalling & Interlocking Systems. The System does not claim to detect Rail Fractures at all, especially those, which are on the Rail Head or are of Hairline nature and are on the Negative/Traction Current carrying Rail. In addition, Rail Head Cracks and Hairline Fractures even on the Positive Rail also will not get detected.

There is need to appreciate the difference between Fail Safe Train Detection System, which is the base of Interlocking and the System of Rail Integrity Monitoring System deployed Worldwide. On IR, One Rail, which carries Traction Current or is used for Polarity Staggering for Safe Train Movement Detection cannot be monitored for Rail Breakage.

For detection of Broken Rail or Weld, Track Bound Instrumented Inspection Vehicle and Online Rail Monitoring Systems have been deployed in developed Railway Systems.

Striking Balance between Mobility and Safe Enough Strategy, the Signals can be restricted to Double Yellow or even Yellow, when the Track Circuit has dropped and the Axle Counter shows clear. This is in addition to the ASMs response as per SWRs, to such indications on the Panel and the Maintenance System stipulated for Rail/Welds. [Safety Directorate: Six Months]

20.5.8. Alerts on Panels: An alert system to be built in the Panel/VDU to warn ASM of non compliance of important rule such as GR 3.38(2) as available on Chennai Division and alerts for dealing with GR 3.68, 3.69,3.70. [Signal Directorate: one year]

21. Maintenance of Signalling Assets

21.1. Proper functioning of signal gear ensures safe running of trains. More importantly, it eliminates shortcuts that directly impact safety.

21.2. There has been a constant decline in staff for signal maintenance per unit asset over the years. The quality of staff has also not kept pace with the increased sophistication of signal assets. This shortcoming can be largely overcome by induction of technology for online monitoring and diagnostics, better communication and logistics.

21.3. Recommendations:

21.3.1. An IT based Asset Management System for online recording of signal defects, keeping records of assets, their age and maintenance history and management level monitoring, on the lines of CMM, FMM or TMS should be created within next one year. [Signal Directorate: one year]

21.3.2. The Cash Imprest of each SrDSTE should be increased to Rs. 10 lakh to be recouped every month. Recoupment should be automatic by recharging a prepaid card. Account of the previous month may be sent separately. [Finance directorate: three months]
21.3.3. A SrDSTE should be permitted to buy stock or non-stock items, without any restrictions, out of this Cash Imprest. [Finance directorate: three months]

21.3.4. Rule 145 of the GFR 2005 for purchase of up to Rs. 15,000 without calling for multiple quotations should be made immediately applicable in Railways. [Finance directorate: three months]

21.3.5. A SrDSTE should be empowered to hire road transport for movement of men and material to attend to failures and exigencies without Finance concurrence. [Finance directorate: three months]

22. **Automatic Train Protection (CSP 4.6)**

22.1. The issue is important enough to be discussed separately from the para on Signalling. No modern train system in the world operates without an ATP System in place. (Kh I 1.12, K 3.5.1 and K Suppl. 3.2)

22.2. In spite of frequent SPADs in Europe there have been no casualties. (K Suppl. 3.2)

22.3. Each country has developed its own version of ATP and most of these meet the ETCS-I level stipulations. (K Suppl. 3.2)

22.4. **Recommendations:**

   22.4.1. IR should now lay down a roadmap for introduction of ATP on its network. This should be done within next six months. [Signal Directorate: six months]

   22.4.2. An India specific ATP system, matching at least ETCS L-1 standards should be developed. The endeavour should be to ensure significant indigenisation of the hardware and software and full indigenous support. This should be finalised within a year. [Signal Directorate: one year]

   22.4.3. TCAS should be developed as a sub-set of the ATP. Necessary upgrades and changes in the TCAS system should be done to ensure this simultaneously. [Signal Directorate: one year]

   22.4.4. Assured Funding should be provided for the ATP System so that ATP on all A&B Routes can be provided by March 2022. [Finance Directorate: four years]

23. **Communication Backbone (K 4.4.4 and CSP 5.17)**

23.1. Wireless is the way forward. With increasing number of devices, portable radios, other communications systems, on-board equipment and Trackside installations, Distribute Power (Locotrol), EOTT etc. it is unavoidable that IR sets up a secure, irrepudiable and recordable communication system as the step towards “Internet of Trains”. It is also the sine qua non for a robust Automatic Train Protection System (ATP).

23.2. A Mobile Train Communication System based on Radio and GSM-R is the need of any modern railway system. This provides for communication so secure that even train passing, gate operations, operation of blocks etc. can be based on it through suitable changes in GR and Operating Rules.

23.3. **Recommendations:**

   23.3.1. A clear roadmap for Communication Backbone including Mobile Train Radio Communication should be drawn within next six months. (K 8.6) [Telecom directorate: six months]
23.3.2. Mobile Train Radio Communication should be installed on Routes A and C within next three years. B and D Routes should be covered in another three years thereafter. (Kh I 2.11.1 and Kh II 3.2.2) [Telecom directorate: three and six years]

23.3.3. A detailed plan for Communication Based Train Control (CBTC) in Suburban sections should be created within next one year and implemented in five years. (K 8.5) [Telecom Directorate: one year]

23.3.4. A pan-India license for radio frequency (spectrum) should be taken centrally by the Railway Ministry to enable communication between wireless devices. This should be done within next six months. [Telecom Directorate: six months]

24. Signal Passing At Danger (SPAD)

24.1. SPAD is a worldwide phenomenon and a lot of research is being done to control, if not eliminate it altogether.

24.2. Analysis of SPAD (Annexure – 10) indicates that majority of incidences happen after “home rest” (HQ Rest) or full rest or leave. This is counter intuitive, but point us towards a need for not only counselling, but also to a scientific approach to the problem. This is due to the fact that quality rest is missing during such long home-station rest as the loco pilot is preoccupied with attending to personal and family matters.

24.3. SPAD by departmentally promoted crew is much higher as compared to directly recruited crew through RRB and stands at 9.91 and 3.85 per thousand crew in each category respectively. (Annexure – 11)

24.4. SPAD is directly related to fatigue.

24.5. Enquiries into SPAD are perfunctory and only indicate who was guilty, not why it happened. (Kh II 5.5.4)


24.6.1. SPAD should be classified accordingly to the distance of overshooting. Cases of SPAD should be dealt differently upon whether the LP, after committing SPAD, has stopped within the signal overlap or crossed the overlap. This should also decide the penalty imposed on the erring crew. In ATP/AWS Territory this differentiation will not, however, apply. (Kh II 5.5.4) [Safety Directorate: three months]

24.6.2. All new Loco Crew should be recruited with minimum qualification of Diploma. Even departmental candidates should fulfil this criterion. (K 6.3)

24.6.3. All Running Rooms should be air-conditioned and made noise-proof regardless of their geographical location.

24.6.4. There should be a separate Plan Head for Running Rooms, Lobbies and Crew Rest Rooms. (Tripathi 7.5.3)

24.6.5. Loco Pilots coming to duty after availing a periodic rest or after a leave should be made to take a mandatory rest of 6 hours in the running room before being booked for a train.

24.6.6. Loco Crew should be called to duty not before 08:00 hrs. after availing leave till the previous day. (K 6.6)
24.6.7. Breathalysers and Bio-Metric Identification should be integrated into the CMS across all Lobbies within six months.

24.6.8. Loco Inspectors and Officers on footplate should be provided with portable breathalysers to test the crew on the run. (Kh II 3.10.3)

24.6.9. Loco crew should be mandatorily provided with accommodation in their headquarters and required to stay in them.

24.6.10. A study should be commissioned with expert outside help within next three months on Alertness Management and Fatigue Mitigation. IIT-Kharagpur has done work on fatigue in Airlines Pilots. They must be consulted. (Kh II 5.4) [Mechanical Traction Directorate: six months]

24.6.11. There is a need to revise and update the Psychological Tests for running crew. Vienna Test System, an acclaimed testing methodology may be consulted for this purpose. [RDSO: six months]

24.6.12. There is a need to lay down that maximum speed for crossing a signal at caution should not be more than a maximum specified. Provision for speed control already exists in GR 3.07, but no limit has been set by any Railway. This is also in line with maximum speeds prescribed after passing a signal at caution in AWS territory. [Safety Directorate: Three months]

24.6.13. Cellphone jammers should be installed in Loco Cabs to prevent use of Mobile Phones by Loco Crew, a known cause of SPAD and collisions. [Electrical and Mechanical Directorates dealing with Locos and Self Propelled Stock: six months]

24.6.14. LPs/ALPs found guilty of SPAD should never be put back on running duty, if taken back after removal. Establishment Rules need to be changed to enable their posting in other categories. [Establishment Directorate: three months]

24.6.15. The ALP should be tested and certified for application of Assistant’s Emergency Brake operation on the driving simulator by the trainer by simulating a condition where the LP doesn’t react to an unsafe situation. [Zonal Railways: Immediate]

24.6.16. There is not direct supervision of ALPs as available for LPs and LPShunting. There needs to be an LI for every 50 ALPs for better monitoring and mentoring. [Establishment Directorate to issue yardstick: three months]

24.6.17. During categorisation of LPs as A, B or C, the present system of 1 or 0 mark for each of the hundred attribute results in most of the LPs getting categorized as A. This needs to be reviewed and better system designed. [Mechanical Traction Directorate: six months]

24.7. **Supervision of Loco Crew:** Loco crew are counselled and monitored largely by Loco Inspectors and occasionally by the CPRC/CTLC/CCC. There is a need to ensure that experienced and competent staff is selected to these posts.

24.8. **Recommendations:**

24.8.1. Loco Inspectors must not only be experienced, but also drawn from senior levels of the cadre. We must revert to the pre-2009 norms for selection of Loco Inspectors. All Loco Inspectors must be experienced Mail/Express Drivers. [Mechanical Traction Directorate: three months]
24.8.2. CCC/CPRC/CTLC should be drawn from the cadre of LIs. This will ensure correct counselling and monitoring of crew and meaningful interaction with the respective Branch Officers. [Mechanical Traction Directorate: three months]

25. **Train Operations**

25.1. Several devices have been under deliberations for years. Enough trials have been conducted successfully. There is a need to induct them on full scale.

25.2. **End of Train Telemetry of EOTT:** This enables guardless operations of trains as it checks for air pressure continuity and train integrity. If provided with features of brake application, it will also apply brake from the rear end of the train, thus improving braking performance.

EOTT also enables elimination of the Guard Van or the Brake Van, which are prone to derailments. It also enables addition of an extra wagon in place of the Brake Van, thus increasing revenue.

Even if we do not eliminate the Guard and the Brake Van, the EOTT, by itself, provides additional safety.

25.3. **Recommendations:**

25.3.1. EOTT trails should be concluded and policy issued to begin installing the EOTT device in Freight Trains. [Mechanical Development Directorate to conclude trail: six months, Traffic Transportation Directorate to issue policy: one year]

25.4. **Distributed Power (DP) or Locotrol:** DP is required not only for long haul trains, but is immensely useful for a normal length (59-60 wagons) freight trains. (CSP 4.4)

25.4.1. Wherever double heading or a “multi” is required, Locotrol can be fruitfully deployed. It enables elimination of the Brake Van, thus permitting an additional wagon. It eliminates possibilities of derailments of Brake Vans. Locotrol also allows brake application from both ends of the freight train, thus improving braking performance and safety.

25.4.2. Locotrol eliminates need for shunting for engine and Brake Van reversal, reduces coupler forces, prevents wheel-burns and train-parting thus making operations simpler and safer. (K 4.10.3)

25.4.3. Locotrol saves about 8-10% of energy as well.

25.5. **Recommendations:**

25.5.1. Distributed Power Systems should be installed on Locomotives, where the same has been adequately proven. [Electrical RS and Mechanical Traction Directorates to install first five hundred DPs each in electrical and Diesel Locos: two years]

25.5.2. Interoperability between various makes of DP should be ensured by creating an IR Standard for the same. [RDSO: three months]

25.6. **Retroreflective Boards:** All Boards meant for guidance of loco crew, such as Speed Restriction and Termination Boards, Signal Sighting Boards, km Stones, Boards on OHE Masts, Boards on Signal Posts etc. should be retroreflective. This should be done within a year. [Zonal Railways: one year]

25
26. Realtime Safety Monitoring of Rolling Stock

26.1. Trackside safety devices are a standard provision in modern railway systems. They monitor a running train for bearing defects, broken and hanging parts, flat wheels, unusual sounds etc. They can even detect incipient defects that would fail after a few days. It is rather disconcerting that we have not introduced them even after nearly a decade of deliberations. This has become an urgent need since elimination of LC Gates also leads to an important check-point, the Gatekeeper, who often detect hot boxes and hanging parts etc. preventing disaster. (K 4.4)

26.2. Recommendations:

26.2.1. A study to be commissioned to study provision of Trackside Safety Devices in Modern Railroad Systems. This should be done within next three months. Specifications, distance between successive installations, communication protocols etc. must be determined. [Mechanical Development Directorate: three months]

26.2.2. There should be an immediate introduction of such Trackside Detection and Monitoring Systems (Online Monitoring of Rolling Stock, OMRS) with composite features of hot-box, bearing noise, camera-based inspection system, flat wheels, hanging-parts detection etc. The hundred sites as already planed should be installed quickly. [Mechanical Development Directorate: two years for first fifty and another two years for the remaining fifty]

26.2.3. On-board Condition Monitoring Systems (OBMS) that monitor bearings, vibrations and other parameters of rolling stock and communicate to a central server for alerts and action has been under deliberations for many years. OBMS should be fitted in all locomotives, coaches and wagons along with associated IT infrastructure and control room. [Mechanical Development Directorate: two years for the first 2000 locomotives, 20,000 coaches and one lakh wagons, five years for 100% coverage]

26.2.4. Machine Vision Intelligent Devices for detection of rolling stock defects should also be installed at entry of major yards. They should also be equipped with automatic wheel profile detectors. First twenty such machine must be installed within next two years (K 4.8). [Mechanical Development Directorate: two years]

26.3. Weigh Bridges: Weigh bridges are essential to detect and prevent overloading of wagons. Proper functioning, calibration and periodical inspection of weigh-bridges must therefore be ensured. [Zonal Railways: Immediate]

26.4. Recommendations:

26.4.1. A Uniform Operating Protocol for weighing, movement of unweighed wagons, movement of overloaded wagons etc. should be issued on the lines of that in use on NCR. [Traffic Transportation Directorate: three months]

26.4.2. Periodic Inspections of Weigh Bridges should be ensured and made a KPC for evaluation of ADRMs’ performance. In due course, all Trackside Safety Devices should be included in the protocol. [Zonal Railways: Immediate]
27. Material Procurement System

27.1. There is a serious disconnect between the Stores Department and User Departments on definition of out-of-stock situation. Whereas claims of near 100% availability is made by the Stores Department, High Level Accident Enquiries, Corporate Safety Plan or the Kakodkar Report have indicated that there was a chronic shortage of material. A example of shortage, as reported by the CWM, Carraige Workshop, Matunga, Central Railway is placed at Annexure – 12. It lists some safety and critical items, where availability over two years is shown at less than 10% to 50% of the AAC.

27.2. In a recent inter-Railway Safety Audit, the SWR team found that a freight rake certified fit for movement by the NGP TXR was not fit at all. The SWR officer, who was understandably looking only for safety, found that 15 wagons were unfit and marked them sick. The SSE/C&W of NGP was suspended for his "lapse"! When questioned the SSE said that he had chronic shortage of material and that he had no other way out. He was doing it under "pressure" of train operations, an euphemism for blatant disregard for safety.

27.3. If we ignore this reality of chronic shortage of material, we will never achieve safety standards expected of a public carrier. Same is the situation in all areas of maintenance of railway assets.

27.4. EDME/Coaching, during his interaction with the Safety Task Force, indicated that 35% items for coach maintenance (20% being safety items) were out of stock on any given day. He mentioned that even coaches being turned out after POH are often fitted with used brake blocks. Similarly, tack renewals are often done with release track fittings.

27.5. As mentioned above, the AAC is a purely technical decision. The advantage of this step would be that the system is aware, at all times, of the actual requirement of material, the needed budget and purchase grant even if it is unable to purchase the desired quantity for the present. This creates a realistic ground for projection of budget and purchase grants for coming years. Artificially depressing the AAC gives a false sense of fulfilment that the necessary material had been provided for.

27.6. Timely availability and quality of supply, both are important in case of safety items.

27.7. Recommendations:

27.7.1. Anticipated Annual Consumption (AAC), also known as the Estimated Annual Requirement (EAR), should be treated as a purely technical decision. It is based on Maintenance Manuals, RDSO recommendations or real life ground level experience. There is no role for Finance or Stores in deciding or changing the AAC. Likewise past consumption due to bad decisions, or non-availability for whatever reason is not a ground for reduction in AAC. [Stores Directorate to issue policy: one month]

27.7.2. AAC should be fixed by the Executive Department based on the factors referred above. This should be enhanced or reduced depending upon the population of assets in the field. This AAC will remain sacrosanct. [All Technical Directorates to issue policy: one month]

27.7.3. Finance, Procurement Officer or the Tender Committee will not reduce or enhance the AAC at all on account of lack of funds or record of past consumption. If Stores or Finance feel at any given stage, such as the initiating the procurement process, vetting of tender proposal, Tender Committee proceedings, it must mention that "While the AAC is 100 (for example), a Purchase Order can be
placed only for 60 due to shortage of funds in budget or shortage of purchase grant". [Stores Directorate to issue policy: one month]

27.7.4. When the stock level of an item falls to three month’s consumption as per AAC, it should be treated as out of stock and emergency procurement process should automatically set in motion. [Stores directorate to issue policy: one month]

28. Procurement of Safety, Vital and Must-Change Items

28.1. “The most skilled manpower and the finest maintenance practices can achieve little if the materials required for upkeep are substandard or unavailable” (Kh I 2.16.1)

28.2. Whereas stock out of non-safety items can sometimes be tolerated, the same cannot be done for safety items. It is a perishable need. If an asset has gone without it even once, safety has been compromised whether an accident happens or not. Vital and Must-Change items too indirectly impact safety.

28.3. Supply of Safety Items has been uniformly unsatisfactory across the entire Indian Railways. (K 2.13.2, Kh I 2.16.1 and 2.16.6)

28.4. The reality is that in spite of the purchase muscle of IR, suppliers take us for granted. P.O. supply dates are ignored so that sub-standard material is accepted by the user out of desperation. Such instances are too numerous to be ignored. There is at best complacency or at worst a nefarious design.

28.5. In matters of safety, timely supply is as important as quality of supply. Suppliers must therefore be kept on their toes, which is best done by the final user since he/she knows where the shoe pinches. This can be best done by creating a scenario of competition "even after the P.O has been placed".

28.6. Recommendations:

28.6.1. In each tender case for Safety, Vital and Must-Change items, P.O. should be placed on two firms for half the required quantity each. It will work like a mini Rate Contract. The end user, for example, a SrDSTE, a SrDME/C&W or a SrDEE/Car Shed will be empowered to directly requisition material from either of the suppliers based on his performance against yardsticks of timely supply and quality. This will revolutionise availability of such items. (Kh II 2.16.6) [Stores Directorate to issue policy: one month]

28.6.2. P.O. for Safety, Vital and Must-Change Items should be placed for long term for up to 3 years. [Stores Directorate to issue policy: one month]

28.6.3. Each bidder in tenders for Safety, Vital and Must-Change item must give an undertaking that if any malpractice is found in its business with Railways he will be summarily removed from the Approved List. A clause to this effect should be drafted by RDSO and circulated within next three months for inclusion in tender notices. [Stores Directorate to issue policy: one month]

28.6.4. Tenders for Safety, Vital and Must Change items should necessarily have provision of Earnest Money and Security Deposit. [Stores Directorate to issue policy: one month]

28.6.5. Each Department will prepare a list of up to fifty Safety Items, fifty Vital Items and a hundred Must-Change Items for each type of asset, such as the LHB Coach, ICF Coach, WAG9 Loco, EMUs, BOXN Wagons, BLC Wagons,
Signals, Track Circuits, OHE, PSI, etc. Procurement of these items will be governed by the provisions given above. (K 2.13.1) The lists will be issued by respective Directorates in the Railway Board as a purely technical decision unencumbered by the Finance or Stores Directorates. The list and the AAC for each of these items will be approved at the Zonal level by the PHOD of the Department independent of Stores and Finance departments since this is a purely technical exercise. [All Technical Directorates: three months]

28.6.6. Availability of funds should not be pre-requisite for initiating purchase of Safety Items. (Kh I 2.16.7) [Stores Directorate to issue policy: one month]

28.6.7. If the full monthly quota of a Safety, Vital and Must-Change Item is not issued, it must be considered out-of-stock. [Stores Directorate to issue policy: one month]

28.6.8. There should be no vetting of the P.O. for Safety, Vital and Must-Change Items. The Finance Officer in the TC should carry out the necessary checks. [Stores Directorate to issue policy: one month]

28.6.9. Finance Concurrence for operating the 30% Option clause for Safety, Vital and Must-Change Items should be dispensed with. [Stores Directorate to issue policy: one month]

29. Complex Products

29.1. With increasing complexity of Rolling Stock, Signal and Telecom Equipment, more and more of these or their subassemblies are being procured to “performance specifications”. Indeed, this is the trend worldwide and in all spheres, not merely in Railways. To a Railway maintenance personnel such systems or sub-systems are mere black boxes, which must perform certain tasks given certain inputs.

29.2. A brake block or a wheel does not require maintenance; it is a use and throw product. We could theoretically buy it from unlimited number of sources as long as our Quality Assurance Plans are robust. But, the same cannot be said about a modern Computer Controlled Brake System, Traction Convertor, SSI etc. which have hundreds of components and proprietary software. It has a codal life of, say ten or fifteen years during which it requires servicing, replacement of parts and filters, updating of software and so on, all proprietary.

29.3. Besides, even a qualified Railway engineers is not well versed with the internals of such diverse designs procured for the same purpose. It would therefore be wrong, unfair and infructuous to expect any useful repair or attention from our artisans, who have a minimum qualification of Class 10 pass, leave aside a few better educated and dedicated staff members.

29.4. Since the public purchase procedure is such that each tender must generally be an open tender, we end up with supplies of many such black boxes from different vendors. Each one of these designs has its own internal layout and parts and components, for which we must necessarily depend on the OEM, either for costly proprietary AMC or proprietary purchases of spare parts. The total cost of ownership of such systems procured on lowest suitable tenders may soon spiral up due to post-purchase proprietary support.

29.5. Every annual tender throws up new players, who, in order to find an entry (typically Chinese companies), bid low and our system finds it difficult to ignore them thus compounding the problem of technology management.
29.6. When the older suppliers, who were the pioneers of those technologies, get edged out by copycat bidders, they leave the business and stop supporting even the systems IR has in the field. The best example is of the Microprocessor Based Control System (MBCS) of ALCo Locomotives, where the original developers, GE and SIEMENS have stopped bidding in our tenders and stopped supporting the products in the field on the pleas that support alone doesn’t pay for their expenses. This is a stark reality and we must be alive to this.

29.7. There is, therefore, a need to limit number of manufacturers of such Complex Products to three as a policy. The ideal would be two competing suppliers, but we can probably not adopt such a policy. It requires wide knowledge of technologies as they develop, market dynamics and exceptional negotiation skills to get reasonable prices. This alone will keep out fly by night operators and prevent cut-throat pricing, both causing harm to our safety and reliability.

29.8. **Recommendations:**

29.8.1. Each Directorate will identify such Complex Products used in assets/areas controlled by it. [All Technical Directorates: three months]

29.8.2. A Policy Directive to be issued for technology management, including purchase, restriction on numbers of vendor-designs, AMC and Proprietary Purchase etc. in such areas, keeping in mind the need to control diversity, skills of manpower and indigenous support systems. (K 2.13.5) [RDSO: three months]

29.8.3. For each Complex System, the Purchase Order should include training of select Railway Supervisors and Artisans from each consignee in different aspects, such as design, maintenance and troubleshooting. [All Technical Directorates: three months]

30. **Procurement of Hardware**

30.1. Hardware and fasteners (nuts, bolts, screws, washers etc.) is another critical item. The world of engineering and design has moved to high-tensile fasteners, indeed IR too has done so in many applications. Failure of hardware can be catastrophic even though its cost may be miniscule. High Tensile fasteners come with high strength and are certified for a given torque and strength by the manufacturer. Opening of Traction return current bonds, fish plate bolts and other track fastenings, falling of battery boxes, falling of brake gear are not uncommon phenomenon, each one of these have caused accidents on occasions and have a continued potential to do so in future. (K 2.13.5)

30.2. **Recommendations:**

30.2.1. All Departments should be asked to study and identify mild steel fasteners which must be replaced with high tensile fasteners. If they choose not to do so, they should be asked to give a certificate that there would be no unsafe situation due to continuing with the old fasteners. [All Technical Directorates: three months]

30.2.2. High Tensile Fasteners should only be procured from reputed manufacturers. There are enough players in the market to get competitive rates. RDSO will
prepare a list of approved vendors for the same within next three months. (K 2.13.5) [RDSO: six months]

31. Delegation of Purchase Powers to Purchase Officers in the Field:

31.1. A crisis is best handled by those who face it. The response time of the Headquarters purchase office is slow and does not address crisis in the field just due to the sheer number of additional levels it has to go through.

31.2. Recommendations:

31.2.1. Purchase Officers in the field, viz. the SrDMM attached with DRM's and the DyCMMs attached with CWMs should be delegated the same levels of purchase powers in the SOP as their counterparts of same rank in the Headquarters, both for stock and non-stock items. This should be done within three months. [Stores directorate: three months]

31.2.2. For tenders floated by Purchase Officers in the field, where acceptance must be at the level of SAG, the DRM or the CWM will exercise the power to accept tenders. [Stores directorate: three months]

32. Vendor Approval

32.1. Pre-approval of vendors, or an approved list of vendors is a globally accepted practice. It does not violate the principles of public procurement as long as the pre-approval process is open and transparent. All major manufacturers of industrial equipment, cars, aircraft and railway vehicles to that.

32.2. Vendor approval is a purely technical decision. There should be no role of Stores or Finance in the process. It doesn't happen in any organisation. This needs to be enforced for all Safety, vital and Must-Change items, to start with.

32.3. Recommendations for Safety, Vital and Must-Change Items:

32.3.1. In case of Safety, Vital and Must-Change items there should not be more than five approved vendors. If a safety item is also a Complex Product, the number of vendors should be restricted to three. (K 2.13.5) [Stores Directorate: three months]

32.3.2. In case a new vendor has to be inducted, the worst performing out of the existing five (three in case of Complex Products) must be ejected from the list. This prescription will keep the vendor approving authority on his toes since due diligence would be required for replacing an existing vendor with a new one. It will also ensure that the existing vendors continue to meet quality and delivery schedules. This will eliminate a situation like 100+ approved vendors for ERCs. (K 2.13.6 and Kh I 2.16.3) [Stores Directorate: three months]

33. Role of RDSO in Vendor Approval:

33.1. Board’s Letter no. 2001/RS(G)/779/7, dated: 07-12-2013 has completely eliminated the role of RDSO in approval of vendors, except for Wagon, TRD, Signal and Engineering Materials. Vendor approval duties have been given to select Production Units. This runs counter to principles of eliminating nexus in purchases.
33.2. If the same authority that approves vendors is entrusted with the role of procurement, possibility of nexus is much wider and deeper at worst and of compromise in quality (due to pressures of outturn) is possible at best.

33.3. RDSO gets a lot of applications for Vendor Registration and Approval and a lot of manpower is employed in their evaluation. There is a need to keep out non-serious applicants.

33.4. In case of Railroads in developed countries, the R&D and Standards organisations are entrusted with vendor approval. The TTCI of AAR (Annexure – 13) or the UIC do it for North American and European Railroads respectively. Same is the prevailing practice in Japan, Korea and China. Even in India, the DGCA approves vendors of many items for purchase by Airlines. These vendor approval authorities do not undertake any purchase.

33.5. We should not lose sight of the fact that RDSO is also a Standards Organisation, a role vital for running a public service across a vast country.

33.6. **Recommendations for Safety, Vital and Must-Change Items:**

33.6.1. The role of RDSO should be expanded in the area of Vendor Development, Vendor Approval and Inspections since it has all necessary test labs and associated directorates under one roof. [Efficiency and Research Directorate: three months]

33.6.2. The Board’s letter no. 2001/RS(G)/779/7, dated: 07-12-2013 should be withdrawn immediately. This is in contravention of the Report of a Judicial Committee headed by Justice Khanna. (Kh I 2.16.5) [Stores Directorate: one months]

33.6.3. Approval of Vendors for Safety, Vital and Must-Change Items as identified by various Directorates of the Railway Board should be entrusted to RDSO within next three months. [Efficiency and Research Directorate: three months]

33.6.4. Likewise, Inspection of these items should also be entrusted to RDSO. [Efficiency and Research Directorate: three months]

33.6.5. Inspections should also look at process control of the vendor rather than just the final quality. This should be incorporated in the RDSOs QAPs within next six months. [RDSO to revise QAPs: six months]

33.6.6. The supervisory cadre of RDSO suffers from chronic shortage. These should be filled up within next six months so that RDSO can take up this expanded task in right earnest. RDSO should be permitted to select technically competent and willing personnel for this purpose. [Efficiency and Research Directorate: three months]

33.6.7. A Supervisor selected to work in RDSO should be given a special allowance of 30% to encourage and motivate the best brains. [Efficiency and Research Directorate: three months]

33.6.8. The registration application fee prescribed for aspiring Vendors should be raised to Rs. 2 lakh for small and medium companies and Rs 5 lakh for large companies. For foreign applicants the fee should be raised to US$ 10,000/- [RDSO; three months]
33.6.9. Vendors failing in delivery schedule and quality need to be ruthlessly stamped out. RDSO should create an on-line portal for logging of vendor performance by users of safety, vital and must-change items. A robust, yet user-friendly reporting system is the sine qua non for Vendor Evaluation. (K 2.13.6 and Kh I 2.16.3) [RDSO; three months]

34. Grading of Vendors

34.1. Railway Board, vide Letter no. 99/RS(G)/709/1, dated: 18-11-2016, has removed the grading of Vendors into Part 1 and Part 2. This is contrary to international railroad practices. AAR (TTCI), for example, provides for two levels of vendor approvals as “Conditional or Limited Approval” and “(Unlimited) Approval”. (Annexure – 14) Progression from Limited Approval to the Next Level requires a minimum two years of supplies and satisfactory performance. We are running a public transport. Certification of a vendor through steps provides for close monitoring of quality of vendors at Development and Part II stages. This is also reflected in categorisation of Loco Pilots and Station Masters as A, B and C and D where attention of the supervisor is more on the lower categories.

34.2. Stages of Part I and Part II has been extremely helpful in disciplining vendor by nudging them and not stamping them out completely.

34.3. Recommendations:

34.3.1. Railway Board’s Letter no. 99/RS(G)/709/1, dated: 18-11-2016 should be modified with clarification that the provisions therein will not apply to Safety, Vital and Must-Change Items. [Stores Directorate: one month]

34.3.2. There should be no provision of a 20% (or up to 20%) Developmental/Educational order for Safety, Vital and Must-Change items. All vendors must be pre-approved by RDSO. (Kh I 2.16.3) [Efficiency and Research Directorate: three months]

34.3.3. Even the provision of 5% order outside the tender quantity should not apply to Safety, Vital and Must-Change items. All vendors must be pre-approved by RDSO. (Kh I 2.16.3) [Efficiency and Research Directorate: three months]

35. Manpower Planning and Training

35.1. Training of Technical Officers (Engineers): Railway Officers in Engineering, Electrical, Mechanical, Signal & Telecom serve core engineering functions. Upon their ability to cope with ever changing technology depends safety. Indeed, even adoption of new technology and its acceptability depends upon the currency of an engineer’s knowledge. They must therefore be encouraged and facilitated to continuously upgrade their knowledge. All technical officers need to be exposed to the latest technological developments in India and abroad.

35.2. Technical staff (artisans/technicians) of Railways, in Mechanical, Electrical, Engineering and Signal may see three or more disruptions in his way of working due to new technologies being inducted. Even graduate engineers, recruited through the UPSC find it difficult to cope with this. Expecting Artisans, who are often no more than Class 10 pass, to seamlessly adapt to new technologies is invitation to trouble. With multisourcing of Complex Products, the situation is further compounded.
35.3. Recommendations:

35.3.1. Technical Officers must be freely allowed, indeed actively deputed, for short term training programmes in International Institutes teaching advanced railroad technologies. A two-week programme for each officer early in JA Grade, early in Selection Grade and then early in SA Grade should be planned, at least two of which should be in Institutes abroad. [Training and MPP Directorate: three months]

35.3.2. Select technical supervisors too should be nominated for such training courses in India and abroad. [Training and MPP Directorate: three months]

35.3.3. Refresher courses for Supervisors and Artisans/Technicians involved in maintenance must undergo an annual refresher course of one week, instead of three weeks or longer every three years. [Training and MPP Directorate: three months]

35.3.4. For high-skill trades like TXR Staff, Welders, ESMs, Loco Shed Staff etc. the annual refresher course should be of two week duration, followed by a test and certification/re-certification. (CSP 7.7) [All Technical Directorates to issue policy: three months]

35.3.5. Recruitment of Artisans: Recruitment of artisans and technicians in Group D or Group C needs to be done so that only those persons are recruited, who have hands-on training and certification in the related trades. With the government’s emphasis on vocational training, it is now increasingly possible. It is therefore recommended that only Class 10/12 and ITI pass candidates should be selected for the Railways through RRBs and RRCs. This will ensure that they are ready for mechanisation and automation as and when IR adopts more and more modern ways of working. (K 6.3) [Establishment Directorate to issue policy: three months]

35.3.6. Additionally, Group D Staff being recruited as Trackmen should be subjected to rigorous physical test since their job in the initial years of service will involve heavy lifting and tiring work. Yardsticks for the same should be redrafted within next three months, especially for women candidates. [Establishment Directorate: six months]

35.3.7. e-Learning for all artisan staff should be a mission item, where they are encouraged to attend at workplace or at home. e-Learning courses should be prepared through professional agencies in the field. (Kh II 5.2.7 and CSP 7.7) [Training and MPP Directorate to issue policy: three months]

35.3.8. Similar e-Learning programmes should be created for Station Masters and Loco Crew. [Training and MPP Directorate to issue policy: three months]

35.4. Empowerment for Training and Human Resource Development

35.4.1. GMs should have full powers to upgrade old and open new Institutes and Sanction Teaching Allowance to the Teaching Staff thereof. They should also have full powers to create new training facilities in Emerging Areas of Technology. [Training and MPP Directorate to issue policy: three months]

35.4.2. Teaching staff of ZRTIs, Divisional and Workshop training centres should be selected by DRMs and CWMs respectively in consultation with their associate
Personnel Officers without dependence on Head Quarters. [Establishment Directorate to issue policy: three months]

35.4.3. Delegation of Powers to PHODs, DRMs, CWMs for training in non-Railway establishments for up to Rs. 10,000 per day and Rs. One lakh per training programme without Finance Concurrence with an annual limit of Rs. One Crore. [Training and MPP Directorate to issue policy: three months]

35.4.4. GMs should have unrestricted powers for sanctioning training in non-Railway establishments without Finance Concurrence. [Training and MPP Directorate to issue policy: three months]

35.4.5. Each CTI should be provided with an Annual Lump-Sum Improvement Fund of Rs. One Crore, to be utilized as per the discretion and judgement of the Director. [Training and MPP Directorate to issue policy: three months]

35.4.6. Each ZRTI and lower level Training Institute should be provided with an annual lump-sum improvement fund of Rs. Fifty Lakh, to be utilized as per the discretion and judgement of the Principal and PHOD/DRM/CWM. [Training and MPP Directorate to issue policy: three months]

35.4.7. Each CTI should be independent of the adjoining Railway in matters of Sanction of Works (PH-65) and for Maintenance of its Assets - engineering, electrical and telecom etc.) [Training and MPP Directorate to issue policy: three months]

35.4.8. Directors of CTI’s should be empowered to invite faculty and experts from within India and abroad for up to an annual limit of Rs. One Crore without Finance Concurrence. (K 6.2.3) [Training and MPP Directorate to issue policy: three months]

35.4.9. Principal and PHOD/DRM/CWM of ZRTIs and Lower Institutes should be empowered to invite faculty and experts from within India for up to an annual limit of Rs. Twenty Lakh without Finance Concurrence. [Training and MPP Directorate to issue policy: three months]

35.5. **Recommendations for Training and Certification of Loco Crew**

35.5.1. Each LP and LP must undergo a refresher course of one week every two years, which should include GR&SR, Safety Rules and instructions and a Simulator Test. A three-yearly refresher course is inadequate. (Kh II 5.3.1)

35.5.2. The current practice of issue of Competency Certificate to loco crew by the Branch Officer needs to be backed by actual foot-plate test by a Loco Inspector specifically nominated for this purpose.

35.5.3. Each loco pilot training centre, at least one in each Zonal Railway, should be equipped with a full scale in-motion driving simulator for each generation of Locomotive, EMU/MEMU/DEMU. [Training and MPP Directorate to issue policy: three months]

35.5.4. These simulators are to be used for testing and certification. If a loco pilot fails the simulator test, he/she should be treated as having failed in the training programme and made to repeat the entire training again. [Training and MPP Directorate to issue policy: three months]
35.5.5. Each major crew booking, at least one in each Division, should be equipped with a table-top driving simulator. These are low cost machines, but are capable of giving a loco pilot a quick refresher in areas he needs. A countrywide Railnet based network and a central database of running crew should be prepared. This will have specific training needs of each loco pilot, as noted by the LI or Officers-in-Charge. Each loco pilot, once in a month, upon signing off, will be required to undergo a 1-2 hour long simulator training session specifically determined for him. (K 6.7 and CSP 7.16) [Training and MPP Directorate to issue policy: three months]

35.5.6. Simulators should also be procured for EMU/ MEMU and DEMU motormen. (CSP 7.16) [Training and MPP Directorate to issue policy: three months]

35.5.7. There should be a system which ensures that errors in the field are communicated to Training Institutes to create a case-study based learning technique. [Safety Directorate: three months]

35.6. Training of Station Masters

35.6.1. Each SM/ASM, involved in train operations must undergo a refresher course of one week every two years, which should include GR&SR, Safety Rules and instructions, counselling by a TI and a Simulator Test. A three-yearly refresher course is inadequate. ) [Training and MPP Directorate to issue policy: three months]

35.6.2. Panel Simulators should be provided in each ZRTI like that in Maula Ali. ) [Training and MPP Directorate to issue policy: three months]

35.6.3. There is a need to revise and update the Psychological Tests for SMs/ASMs. ) [Training and MPP Directorate to issue policy: three months]

35.6.4. Monitoring of Training and Coordination with Various Training Institutes: The Personnel Department should play a proactive role in keeping records of training, recommending and monitoring the same. ) [Training and MPP Directorate to issue policy: three months]

35.6.5. There should be a system which ensures that errors in the field are communicated to Training Institutes to create a case-study based employee-focussed learning technique. ) [Training and MPP Directorate to issue policy: three months]

35.7. Recommendations:

35.7.1. Training Manager: Every Zonal Railway and PU should nominate a DyCPO/SPO as Training Manager, whose exclusive charge should be training of Officers, Supervisors and Staff. (CSP 7.14) ) [Training and MPP Directorate to issue policy: three months]

36. Protection of Worksites:

36.1. Precaution at worksites are sometimes lacking, which leads to unsafe condition for staff and train operations.
36.2. **Recommendations:**

36.2.1. After every reconnection following work on signal gear, correspondence between site and panel should be ensured before permitting traffic. [Safety Directorate: one month]

36.2.2. Before every crane work, the site should be inspected and certified by a senior supervisor and prepared for location, propping, movement and physical clearances for crane operations. [Safety Directorate: one month]

36.2.3. In case work is taken up by non-openline agencies, such as Construction, RVNL etc. the responsibility for protection and safety for up to 100m on either side shall rest with such agency. [Safety Directorate: one month]

37. **Protection of Workmen at Worksite (K 5.46)**

37.1. It is sad that Railways spend so much time and money in endeavour to provide safe journey to passengers see a large number of its own workmen dying or getting injured at worksites. This saps the morale of the workforce and dilutes dedication.

37.2. **Recommendations:**

37.2.1. Worksites of major works, extending for more than a day, must be audited at the level of an officer before commencement of work to ensure that all safety measures for protection of workmen, Railway’s or Contractor’s have been put in place. [Track Directorate: one month]

37.2.2. Periodical audit for ensuring Workmens’ safety should be done every week if the work extends to longer than a week. [Track Directorate: one month]

37.2.3. All Railway’s and Contractor’s employees should be mandatorily provided with necessary safety gear such as luminous jackets, crash helmets, industrial boots, safety belts, safety jackets etc. (K 5.46 ii) [Track Directorate: one month]

37.2.4. Disaster Management Staff of ART, ARME and others should be provided special training in personal safety. [Mechanical Traction Directorate to issue policy: one month]

38. **Organisational Reorientation**

38.1. **Information Driven Organisation:** IR must become an Information driven organisation from an Opinion or Anecdote driven one. This requires massive influx of IT Systems, Data Analysis Tools and an Organisation wide information sharing culture. The Task Force was told that the OneICT platform endeavours to do this.

38.2. **Following is, however recommended to prepare the organisation for OneICT:**

38.2.1. Purchase of PCs and Accessories should be liberalized. Each PHOD/CHOD/DRM/CWM should be empowered to sanction up to fifty additional PCs and Accessories every year without Finance concurrence. This is essential for the very first step of IR-OneICT, i.e. “Transformation Office Set-up” [C&IS Directorate: three months]

38.3. **Supervisors:** Supervisors have traditionally been the front end managers and the backbone of Indian Railways. There has been a dilution in their contribution to the well
being of Railways as felt all across. This has been felt by the Group on Railway Safety, 1996 and also the Khanna Committee. (Kh I 3.2.3).

38.4. At the same time it is necessary to strengthen the hands of Supervisors to empower them.

38.5. **Recommendations:**

38.5.1. Supervisors should not be allowed to join Trade Unions. (Kh I 3.2.3). [Establishment IR Directorate: three months]

38.5.2. They should be encouraged to form their own Association for collective bargaining and negotiation and should find a place in PNM’s and PREM Group. Similar provision has already been done for the RPF Staff. (Kh I 3.2.4) [Establishment IR Directorate: three months]

38.5.3. D&AR Powers of Senior Supervisors was completely withdrawn as a consequence of the 6th Pay Commission. This should be restored. [Establishment Directorate: three months]

38.5.4. Likewise, D&AR Powers of Junior Scale Officers should also be restored. There is, in reality, a need to restore all D&AR Powers to pre 6th PC provisions. [Establishment Directorate: three months]

38.5.5. Supervisors should be empowered to grant spot cash awards to their staff to the extent of Rs. 500 in each case subject to an annual limit of Rs. 10,000. (Kh I 3.4.2) [Finance Directorate: one month]

38.6. **Safety Whistleblower:** In order to receive inputs and feedbacks about unsafe situations in train operations, maintenance and other areas of organisation, IR must encourage Railway Persons and General Public to freely and without fear of reprisal communicate.

38.7. **Recommendations:**

38.7.1. A portal will be created by the Railway Board within next three months to receive inputs on matters of safety. [Safety Directorate: three months]

38.7.2. If the sender desires to remain anonymous, his/her name and other details should be kept secret.

38.7.3. The portal should have the features to forward the communication to the concerned persons and to receive feed back from them.

38.8. **Safety Organisation**

38.9. IR provides that ex-DRMs should be posted as Chief Safety Officers. Some yardstick has also been laid down for SrDSOs and DyCSOs. But, with nearly everyone getting “Very Good” or “Outstanding” grading in his appraisals, the posting of officers, other than CSOs remains an area of indifference. A SrDSO or a DyCSO has to work practically without any assistance and must do tough inspection calls apart from copious paper work. This makes the post of a DyCSO or a SrDSO very unattractive and unwilling officers are pushed into Safety Department. Most Railways have their Safety Department cadres of support staff sanctioned as part of Operating Department. This situation need to be cured.

38.10. **Recommendations:**

38.10.1. The Safety Department in each Zonal Railway should have a clearly defined sanctioned strength as follows: [Safety Directorate: three months]
• CSO – 1  DyCSOs – 4  Safety Counsellors – 5  
• Chief OS – 1  OS – 1  Sr Clerk/Clerk – 4  PS/Stenographers – 3  
• Office Peons – 4  Motor Drivers – 2

38.10.2. A similar enabling set-up in divisions should also be created as follows:  

[Safety Directorate: three months]  
• SrDSO – 1  DSO/ADSO – 1  Safety Counsellors – 5  
• Chief OS – 1  OS – 1  Sr Clerk/Clerk – 4  PS/Stenographers – 1  
• Office Peons – 2  Motor Driver – 1

38.10.3. The CSO, DyCSOs, SrDSOs and Safety Counsellors should be entitled to a Safety Allowance @30% of their basic pay. [Establishment Directorate: three months]

38.10.4. The CSO and each DyCSO and SrDSO should be provided with a motor vehicle – departmental or hired. [Establishment Directorate: three months]

38.10.5. Every Safety Officer, upon posting to Safety organisation, should be given a two-week cross functional training in NAIR, which brings out interplay of factors leading to unsafe situations and accidents. [NAIR: three months]

38.10.6. Every Safety Officer should be given a one-week training in Accident Investigation in a specialised Institute in India or abroad. [NAIR: three months]

38.11. **Quality Systems in Procurement of Material and Services:** While Railways have a proven system of internal checks and balances, the impact remains incomplete without implementing a robust quality system on our suppliers and contractors.

38.12. **Recommendations:**

38.12.1. A thorough review of quality system for material procurement process should be commissioned to an external expert agency. User departments should play an active role in the process. This should be done within next three months and a report obtained and implemented within the next one year. (K 2.13.8)  
[RDOSO: three months]

38.12.2. A similar study should be commissioned for quality systems to evaluate deliveries through works contracts. This should be done within next three months and a report obtained and implemented within the next one year.  
[Finance Directorate: three months]

38.13. **Relationship of Finance and Executive:** Para 108 of the Indian Railways Accounts Code underlines that there may be occasions of disagreement between Finance and Executive. The procedure to handle such a disagreement lays down the possibility of an endless escalation of the matter by the Finance to Zonal Railway Head Quarters and then to the Railway Board. At each level, the Finance has the overriding authority to escalate the matter to the next higher level in case of disagreement with the executive at that level. It is not only time consuming, but also provides an escape route to officials at lower levels of passing the buck to higher levels. Such a procedure is not conducive to quick and responsible decision making in a dynamic organization like the Railways. The executive has to finally deliver and hence must be empowered to take the final call.
38.14. **Recommendations:**

38.14.1. The Executive at each level will normally act on the advice of the associate Finance. But, if the Executive thinks that the observations of advice of Finance is not conducive to smooth functioning of the organization, obstructs speedy implementation of projects, or directly impacts safety or output, he/she should, record his/her opinion in writing and go ahead with the proposed action under advice to the next higher authority. [Finance Directorate to issue amendment to the provision in Accounts Code: three months]

38.15. **Innovative Financing:** Capital is always scarce. Besides, sanction in Capital requires Parliamentary approval and is time consuming. Expensive Machines and Equipment can be more easily acquired on lease of on OPEX Model. Similar exercise is already being done for official transport vehicles in the Railways. This needs to be expanded to higher levels. Some ready examples are acquisition of Rail Grinding Machines, Track Recording Cars, Mobile Flash Butt Welding Machines, Vehicle Borne Rail Testing Machines etc.

38.16. **Recommendations:**

38.16.1. A Comprehensive Policy on OPEX route of hiring/leasing expensive equipment should to be issued within next six months. [Efficiency and Research directorate: three months]

38.16.2. PHODs/CWMs should be empowered to enter into OPEX contracts once such a policy is in place. [Finance Directorate: six months]

38.17. **Relocate Sectional SrDENs/DENs:** It is not uncommon to find Sectional SrDENs/DENs sitting at Divisional Headquarters, even when their sections start a hundred kilometers away from office location. It implies that even their first foot in the section is a “tour” and just travelling to and from the beginning point of their section may take hours. This severely impacts involvement and dilutes supervision. On the other hand, Branch Officers like SrDME/Dsl or SrDEE/RS sit in their workplaces in the shed. Area Officers too sit in their areas.

38.18. **Recommendations:**

38.18.1. Sectional SrDENs/DENs should be relocated within their “Sections”, if necessary by creating office and residential infrastructure. They may retain an office chamber in the Divisional Office too. [Engineering Directorate: three months]

39. **State of Railway’s Finances and Impact on Safety**

39.1. It is now well known that Railways Finances are under pressure and earnings are not keeping pace with Budget Projections or even with last year’s levels. Yet, our spend on core maintenance activities should not take a hit on that account. Recent years, probably last two decades, have seen increased dependence on Capital for even routine maintenance. For example, more and more spares for Rolling Stock are now being sourced through Capital or DRF rather than Revenue.

39.2. It was learnt in a Safety Audit of Northern Railway that even routine inputs like Ballast for Track is being denied from Revenue heads. A large survey of PWay Depots in Central Railway revealed (Annexure – 6) that even essential supply of track fittings is made only to the extent of 15-25% of the annual requirement. A certain frustration has set-in due to
non-availability of funds under Revenue and the system has started depending on Capital Sanctions, which is sporadic and inadequate.

39.3. A look at Annexure – 7 will reveal that allocation under PU-27 and PU-28 of Demand Head 4 (Repairs and Maintenance of PWay and Works) has not only been meagre (Just about Rs. 400 Crores for the entire Indian Railways) but has also remain virtually stagnant for the last ten years when adjusted for inflation. Similar Situation exists for PU-27 and PU-28 in Demand 6 (Repairs and Maintenance of Carriages and Wagons) in spite of a significant increase in population of these stocks.

39.4. The allocations for DRF has seen even more disturbing decline (Annexure – 8). Gross outlay for replacement of ageing assets has declined, adjusted for inflation, over the last ten years. In fact, the allocation for the Year 2016-17 is lower than that in 2007-08 even in absolute terms – Rs. 7160 Crores against Rs. 7602.72 Crores.

39.5. Recommendations:

39.5.1. Allocation to Primary Units for purchase of stock and non-stock should see a multifold increase. This will require issue of a policy directive to make stocking of items and their purchase easier, such as not comparing the new demands with past years’ consumptions, stocking of items actively being encouraged and simplified. [Finance Directorate: one year]

39.5.2. Technical Departments should go back to basics, consult maintenance manuals, best practices, RDSO’s recommendations and technical orders to determine realistic demands for Safety, Vital and Must-Change Items. [All Technical Directorates: six months]

39.5.3. Allocation to DRF should not only neutralize inflation, it should also consider the increasing asset base and increased traffic levels. [Finance Directorate: one year]

39.5.4. The Purchase Grant given to the Stores Department should be split into two parts, one for Safety, vital and Must-Change Items and another for the rest. (Kh I 2.16.7) [Finance Directorate: three months]

39.5.5. Railway Safety Fund, which is now well endowed (Rs. 10,780 Crores for the Year 2016-17 as per Annexure – 9, should cover track renewal, bridge safety works, Modernisation of Signal & Telecom and Safety Retrofits on rolling Stock as well. [Finance Directorate: three months]

39.5.6. Expenditure Control Circulars should not apply to Safety, Vital and Must-Change Items. [Finance Directorate: immediate]

40. Application of IT for Asset Management

40.1. Even though IT has been gainfully adopted in areas of passenger interface, such as Passenger Reservation, Ticketing, Freight invoicing etc. Technical Departments have not used it effectively for monitoring of assets and safety, the sole exception being the Track Management System (TMS). REMMLOT, an online monitoring system for health of Diesel Locomotives is a shining example of IT and Communication put to effective use. Same/similar level of monitoring should eventually come to other stocks as well.
40.2. **Recommendations:**

40.2.1. Each and every Vehicle moving on rails, such as Coaches, Wagons, Locomotives, Self-propelled Stock, Motor/Moped & Push Trolleys, Utility Vehicles, ARTs/ARMEs, Cranes, Track Machines, Tower Wagons, everything, must be radio tagged and provided with tamper-proof RFID tags. (K 4.4.4) [Mechanical Development Directorate: two years]

40.2.2. There should be a reliable traceability of wheels built into the system. (CSP 6.36) [Mechanical Workshop Directorate: six months]

40.2.3. Comprehensive database of Rolling Stock, every Coach, Wagon and Locomotive to be built with its maintenance history, which can deliver a reliable MIS for actionable points across the country. They should be IR-OneICT compliant. [Mechanical Workshop Directorate: six months]

40.2.4. The IT system so created should also capture “transaction data history”, i.e. the date of entering of data so that tampering of data or post-event entry is easily detected. [C&IS Directorate: six months]

40.2.5. Disjointed and half-hearted efforts for Coach Maintenance, Wagon Maintenance and Loco Maintenance have been going on for last many years. CMM, FMM and SLAM need to be expedited, rolled out nationwide and officers and staff trained to make full use of it. [Mechanical Development Directorate: one year]

40.2.6. It was learnt from AM/IT that funds have been in short supply for these projects. It is felt that investments in these applications have a direct impact on reliability and increased availability for rolling stock apart from safety. It is therefore felt that funding from EBR should be done for these applications provided a workable ROR is possible. [Finance Directorate: six months]

40.2.7. Similar on-line data capture and MIS should be adopted for Signal & Telecom assets as well. [Signal Directorate: one year]

40.2.8. Safety Department should have unrestricted read-only access to such databases. [C&IS Directorate: immediate]

40.2.9. REMMLOT should be installed in all new Electric Locomotives w.e.f. 01-04-2017. [Electrical RS Directorate: immediate]

40.2.10. REMMLOT must be retrofitted in all existing Electric Locomotives within next three years. [Electrical RS Directorate: immediate]

40.3. **Chief Information Officer:** IR has steadily been increasing its dependence on IT Systems. There is a need to consolidate these to create a seamless way of working. All major companies have a full time CIO to handle such issues.

40.4. **Recommendations:**

40.4.1. Each Zonal Railway, Production Unit and CTI will nominate a full time Chief Information Officer. This should be done within next three months by redesignating a SG/SAG post from any department. Model of NCR, where a Chief Manager IT (CMIT) has been appointed, may be followed. [C&IS Directorate to issue policy: one month]
40.4.2. The CIO will look after the IT facilities such as Networking, Servers, AMCs, Purchases, Database backups and liaise with outside agencies like CRIS, FOIS, RAILTEL etc. [C&IS Directorate to issue policy: one month]

40.4.3. Applications will continue to be owned by the respective Departments.

41. FOG Operations

41.1. Fog, during winter, not only disrupts train operations, many accidents have happened due to poor visibility in fog.

41.2. There is no known technology, not even for air-operations, that enable vision in fog. Only assistive technologies exist, which combine various cameras to project an image of the road ahead.

41.3. Recommendations:

41.3.1. Modified Automatic Signalling, as already adopted, must continue.

41.3.2. Fogpass has undergone several refinements. It must be made SIL 4 compliant, its locational accuracy enhanced and then inducted in adequate numbers to provide assistance to crew during fog. To be done within next one year. [Mechanical Traction Directorate: six months]

41.3.3. Trials with Composite Camera based technologies, which use optical, radio and infrared wavelengths to create a workable image of the path ahead, should be started in right earnest. [Mechanical Traction Directorate: six months]

41.3.4. If found successful these Fog vision Cameras should be installed in locomotives and Motor Cabs in Fog Prone areas. [Electrical RS and Mechanical Traction Directorate: six months]

41.3.5. As an interim measure retro-reflective Zigma Boards should be provided on all masts for five masts in rear of stop signals in electrified territory to indicate to the loco pilot about an approaching stop signal. Similar arrangements should be done for non-electrified territory. [Zonal Railways: six months]

42. Accident Reporting and Enquiry

42.1. The ground reality is that Accident Enquiries, in most/many cases, do not reveal the real cause of accident, not even the proximate cause, such as whether it was a track defect or a Rolling Stock defect. Enquiries often get mired in departmental fights and end up either being compromised or delivering a finding, which is incorrect.

42.2. There is an immediate need to organise Accident Enquiries on the lines of that done by the National Transportation Safety Board (NTSB) of USA. At least the CRS level enquiries should adopt this methodology. (Kh II 5.6.1)

42.3. Departmentalism is the root cause that prevents honest accident enquiries. Departmentalism starts from the daily chore of logging and de-logging of punctuality losses. Copious documents are written and acrimony generated that hits the general harmony in the Divisional working.

42.4. “A new management ethos should be evolved which will encourage and aid honesty even in admission of failure”. (Kh I 2.15.9)
42.5. **Recommendations:**

42.5.1. An honest and transparent system of capture of accident and safety related data should be put in place with a so that no comparison with past statistics would be made as two sets would be incompatible. Reporting of unsafe acts and accidents, howsoever minor should be encouraged. (Kh I 2.15.8) [Safety directorate: immediate]

42.5.2. Equipment failure, as reported first in the Control Office Application by the Controllers, should be taken as sacrosanct. Any subsequent intervention is likely to vitiate the truth. (Kh I 2.15) [Safety directorate to issue policy: one month]

42.5.3. All train timings should be captured through data loggers into the Control Office Application. This may require integrating the Control Office Application with SIMS or any SIMS-like platform created for this purpose. [Signal and C&IS Directorates: six months]

42.5.4. Loss of punctuality should cease to be a Key Performance Metric for annual evaluation of a Branch Officer. Number of failures should, instead, be the Performance Metric. [Efficiency and Research directorate: three months]

42.5.5. An IT based system to compile and analyse the equipment failures thus captured needs to be built to generate an MIS and action plans for corrective action. [Safety Directorate: six months]

42.5.6. Standard proforma for measurements of track and rolling stock has been finalised by RDSO and is awaiting issue. This should be included in the Accident Manual. [Safety Directorate: three months]

42.5.7. Accident Enquiries should go beyond the immediate cause and establish whether there has been a systemic neglect of maintenance, lack of material inputs, poor quality material, lack of training, lapses in supervisory and officer-level monitoring etc. There needs to create a standard performa for accident enquiries to ensure this. [Safety directorate: three months]

42.5.8. Emphasis in every enquiry should be on “what went wrong” rather than “who went wrong”. A policy directive needs to be issued in this matter. [Safety directorate: three months]

42.5.9. A system for “Error Counting” rather than counting of actual incidents or accidents should be established as per the Heinrich Ratio Principle. This is a scientific principle that can prevent actual accidents. [Safety directorate: three months]

43. **Disaster Management**

43.1. IR has created detailed Disaster Management Plans at the Apex level, Zonal Levels and Divisional Levels. Equipment for Disaster Management should also be upgraded in view of induction of high axle load wagons, increase in number of long tunnels, and stainless steel stock. Cold cutting devices currently available in ARTs and ARMEs are not capable of cutting through stainless steel.
43.2. **Recommendations:**

43.2.1. **Telescopic Boom Cranes** with Tunnel Rescue Arrangement have been sanctioned over a decade ago. It was learnt that a tender is under process for over four years. This should be concluded in next three months. (Kh I 3.19.8) [Mechanical Traction Directorate: three months]

43.2.2. Air-plasma cutting devices as already sanctioned need to be inducted immediately. To be done within six month. [Mechanical Traction Directorate: three months]

43.2.3. Explore cold cutting devices for stainless steel within next three months and induct within two years. [Mechanical Traction Directorate: three months]

44. **Safety Cadre Vacancies, Yardsticks and Staff Surrender**

44.1. Safety Category Cadres have a vacancy of 16.44% on a sanctioned strength of 7.47 lakhs, i.e. a shortfall of 1.23 lakhs. The worst affected cadres are those of Guards (27.45%), SSE/SE/JE Pway (20.08%), Keyman (40.01%), Trackmen (21%), SSE/SE/JE C&W (20.72%) and Drivers (24.24%) [Annexure – 15]

44.2. Yardsticks for various jobs must continuously be tightened in view of emerging technologies and their adoption. [Various Directorates: six months]

44.3. Sanction of Staff Essential for Safety, such as C&W Maintenance, Loco Sheds, Signal, TRD, Track and Station Staff, should be done on the lines of that prescribed for Loco Crew, i.e. without matching surrender and purely on the basis of additional workload.

44.4. Surrender of staff is a contentious matter even though it is a desired objective of IR is to lean out its work force. Surrenders are done under coercion and often complied as a matter of “quota”. There is an immediate drop in level of maintenance due to depletion of manpower levels unless there is a matching induction of technology or labour saving devices. It is expected that executive will be more willing to surrender staff if this scheme is implemented, at the same time bringing in technology to improve safety and performance.

44.5. **Recommendations:**

44.5.1. In order to incentivise Staff Surrender the Department or the Officer surrendering such staff should be given two years’ saving on the surrendered staff’s salaries and allowances to acquire labour saving devices, bring in automation, material handling implements, inspection tools, IT equipment etc. to compensate for the loss of manpower. This money will, of course, not be spent in one year and will most likely be spread out over 2-4 years.

44.5.2. RRBs must speed up their process if tightening of yardsticks is to be acceptable. Vacancies yardsticks need to be quickly filled up. The time cycle for recruitment through RRBs and RRCs should be cut down to six months, i.e. from the date the indent reaches an RRB the panel should be ready within six months. (K 2.11.4 and 5.1)

44.5.3. RRBs should make a standby panel of 100% of indented numbers in each selection so that coverage for non-joining and attrition can be made without waiting for the next selection cycle.
44.5.4. **A comprehensive Outsourcing Policy** for non-core activities need to be issued so that surrender of staff does not result in degradation of performance in safety and non-safety areas. This should be done within next six months. (K 2.11.5 and 5.5)

44.5.5. The stipulation of matching surrender for new assets, new services and new facilities should be withdrawn. New assets, services and facilities require additional manpower. [Finance Directorate: three months]

--- end of report ---
References:

Previous Reports related to Safety are referred to as follows:

**Kh I:** Report of the Railway Safety Review Committee, 1998 (Part I): Khanna Committee

**Kh II:** Report of the Railway Safety Review Committee, 1998 (Part II): Khanna Committee

**CSP:** Corporate Safety Plan (2003-2013), August 2003

**K:** Report of the High Level Safety Review Committee, Feb 2002: Kakodkar Committee

**Tripathi:** Report of the High Power Committee to Review the Duty Hours of Running and Other Safety Related Categories of Staff, 2013 (Tripathi Committee)
ANNEXURES
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| Accident per million train KMs | 0.23 | 0.22 | 0.19 | 0.17 | 0.15 | 0.12 | 0.11 | 0.10 | 0.11 | 0.10 |

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### No. of People killed per Billion Passengers carried.

| No. of People | 0.05 | 0.01 | 0.06 | 0.07 | 0.24 | 0.10 | 0.05 | 0.04 | 0.10 | 0.03 |
# ACCIDENT DATA

## ANALYSIS OF CONSEQUENTIAL TRAIN ACCIDENTS (2015-17)

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### LY TOTAL : 40

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### Annexure - 3

51
CTRB FAILURES IN WAGONS

Service wise analysis of reported CTRB failure cases

2015-16
- CC: 50%
- End to End/Intensive: 12%
- Premium: 31%
- NA/NV: 7%

2016-17
- CC: 28%
- End to End/Intensive: 12%
- Premium: 4%
- NA/NV: 49%
## LIST OF LEVERFRAMES/RRI (MEDIUM/LARGE YARDS) DUE FOR REPLACEMENT:

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AVAILABILITY OF TRACK FITTINGS ON CENTRAL RAILWAY
A SERIOUS MANAGERIAL ISSUE

1. At Higher Codal Life

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2. At Minimum Codal Life

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CP (Construction Payment)
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( Figures in Crores of Rupees )

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<td>1</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>10.00-12.00</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>17</td>
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<tr>
<td>12.00-14.00</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>14.00-16.00</td>
<td>3</td>
<td>3</td>
<td>4</td>
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<td>14</td>
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<td>1</td>
<td>14</td>
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<td>4</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>18</td>
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<tr>
<td>20.00-22.00</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>22.00-24.00</td>
<td>4</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>21</td>
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<tr>
<td>Total</td>
<td>44</td>
<td>24</td>
<td>41</td>
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<td>223</td>
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</table>

## Table No. - 7

<table>
<thead>
<tr>
<th>Duty Done (Hrs.)</th>
<th>2013-14</th>
<th>2014-15</th>
<th>2015-16</th>
<th>2016-17</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>G</td>
<td>P</td>
<td>G</td>
<td>P</td>
<td>G</td>
</tr>
<tr>
<td>&lt;2 Hrs.</td>
<td>6</td>
<td>2</td>
<td>10</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>2-4 Hrs.</td>
<td>16</td>
<td>4</td>
<td>15</td>
<td>1</td>
<td>22</td>
</tr>
<tr>
<td>4-6 Hrs.</td>
<td>13</td>
<td>5</td>
<td>7</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>6-8 Hrs.</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>8-10 Hrs.</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>1</td>
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<tr>
<td>&gt;10 Hrs.</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>25</td>
<td>39</td>
<td>26</td>
<td>17</td>
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---

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Annexure - 10
# ANALYSIS OF SPAD

## Table 4A

<table>
<thead>
<tr>
<th>Railways</th>
<th>Total SPAD (excluding Bragg &amp; TRD)</th>
<th>Main Line SPAD</th>
<th>Suburban SPAD (1-4.2012 to 28.8.2012)</th>
<th>Main Line Crew</th>
<th>Suburban Crew</th>
<th>Total Crew</th>
<th>Main line SPAD per 1000 crew</th>
<th>Suburban SPAD per 1000 crew</th>
<th>Total SPAD per 1000 crew</th>
</tr>
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<tbody>
<tr>
<td>CR</td>
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<td>26</td>
<td>10</td>
<td>2471</td>
<td>762</td>
<td>3233</td>
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<td>13.1</td>
<td>10.8</td>
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<tr>
<td>ECoR</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>2364</td>
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<td>0</td>
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<td>2.1</td>
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<td>2215</td>
<td>2.7</td>
<td>2.7</td>
<td>2.7</td>
<td>2.7</td>
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<tr>
<td>ER</td>
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<td>1</td>
<td>7219</td>
<td>696</td>
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<td>1.4</td>
<td>0.3</td>
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<td>Metro</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>396</td>
<td>396</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
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<td>23</td>
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<td>0</td>
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<td>8.1</td>
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<td>9</td>
<td>0</td>
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<td>8.8</td>
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<td>0</td>
<td>1006</td>
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<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
<td>3.0</td>
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<td>NR</td>
<td>24</td>
<td>24</td>
<td>0</td>
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<td>5601</td>
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<td>1.5</td>
<td>1.5</td>
<td>1.5</td>
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<td>SCR</td>
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<td>8178</td>
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<td>SECR</td>
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<td>2.6</td>
<td>2.6</td>
<td>2.6</td>
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<td>SER</td>
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<td>2585</td>
<td>153</td>
<td>2739</td>
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<td>0.0</td>
<td>0.0</td>
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<tr>
<td>SR</td>
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<td>19</td>
<td>0</td>
<td>1480</td>
<td>1845</td>
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<td>2.7</td>
<td>20.8</td>
<td>20.8</td>
</tr>
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<td>SWR</td>
<td>9</td>
<td>9</td>
<td>912</td>
<td>912</td>
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<td>9.9</td>
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<td>WCNR</td>
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<td>6</td>
<td>1899</td>
<td>1899</td>
<td>3.2</td>
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<td>3.2</td>
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<td>2638</td>
<td>5.4</td>
<td>8.7</td>
<td>5.6</td>
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</table>

## Table 4B

<table>
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<th>Type of traction</th>
<th>RRB</th>
<th>Deptt</th>
<th>RRB Crew</th>
<th>Deptt Crew</th>
<th>Total SPAD per 1000 crew</th>
<th>RRB</th>
<th>Deptt</th>
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<tr>
<td>Diesel</td>
<td>35</td>
<td>62</td>
<td>10194</td>
<td>6348</td>
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<td>Electrical</td>
<td>67</td>
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<td>16269</td>
<td>3839</td>
<td>4.12</td>
<td>10.35</td>
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<tr>
<td>Total</td>
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<td>101</td>
<td>20463</td>
<td>30187</td>
<td>3.85</td>
<td>0.92</td>
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</table>
## SHORTAGE OF SAFETY AND ESSENTIAL ITEMS
**(EXAMPLE: MATUNGA WORKSHOP)**

<table>
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<tr>
<th>Sr. No.</th>
<th>Item description with P.I.No.</th>
<th>AAC</th>
<th>Material Received in MTN store During</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>2015-16</td>
</tr>
<tr>
<td>1</td>
<td>Buffer plunger (37.13.0912)</td>
<td>2100 Nos.</td>
<td>2472</td>
</tr>
<tr>
<td>2</td>
<td>Axle box housing (30.02.0487)</td>
<td>700 Nos.</td>
<td>363</td>
</tr>
<tr>
<td>3</td>
<td>Compreg Plywood 12 mm (93.50.0208)</td>
<td>7200 Nos.</td>
<td>6317</td>
</tr>
<tr>
<td>5</td>
<td>Paint Ena. Syn. Ext. Brus. Fin. Air Craft Blue. (77.03.3012)</td>
<td>25200 Ltrs.</td>
<td>8500</td>
</tr>
<tr>
<td>6</td>
<td>110V/120AH cap.valve Regulated Lead Acid Battery (45.17.8460)</td>
<td>750 Set.</td>
<td>199</td>
</tr>
<tr>
<td>7</td>
<td>Head Stock complete assembly (30.12.6150)</td>
<td>100 Nos.</td>
<td>42</td>
</tr>
<tr>
<td>8</td>
<td>M.S Plate 6 mm thick size: 2500 x 1250 x 6mm (90.40.3502)</td>
<td>400 Qts.</td>
<td>483</td>
</tr>
<tr>
<td>9</td>
<td>Aluminum Chequered sheet for EMU Size : 3048 x 880 x 2.03 mm (91.01.2363)</td>
<td>40000 Kgs.</td>
<td>11762</td>
</tr>
<tr>
<td>10</td>
<td>Aluminum Chequered sheet for Mainline Size : 2770 x 813 x 2.03 mm (91.01.2570)</td>
<td>51000 Kgs.</td>
<td>2030</td>
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<tr>
<td>11</td>
<td>EMU Poly carbonante sheet (31.54.7540)</td>
<td>40 Nos.</td>
<td>Nil</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>AAC Revision Sent to HQ.</th>
<th>AAC Revised by HQ.</th>
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<tr>
<td>2016-17</td>
<td>Vide Lt. No. RR/PR/277 dt.15.03.2016</td>
<td>Not vetted till date.</td>
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AAR – THE VENDOR APPROVAL AUTHORITY

ANNEXURE - 13

APPLICATION FOR COMPONENT APPROVAL PROCEDURE

S-060-00


1.0 SCOPE

1.1 This standard outlines the procedures governing application for approval of components, rolling stock, and locomotive equipment contained in the Manual of Standards and Recommended Practices. This standard should be followed when AAR approval is required by the individual product specification.

1.2 The individual product specification should be consulted for additional approval requirements that may be contained therein. When procedures outlined in this standard conflict with approval procedures contained in the individual product specification, the individual product specification shall take precedence.

1.3 It is the responsibility of the manufacturer to ensure that all suppliers of subcomponents meet AAR requirements.

2.0 APPLICATION FOR APPROVAL OR CONDITIONAL APPROVAL

2.1 The request for approval and all other correspondence regarding approval shall be directed to the Association of American Railroads, c/o Chief, Technical Standards, Transportation Technology Center, Inc., P.O. Box 11130, 55500 DOT Road, Pueblo, CO 81001.

2.2 A separate application for approval shall be made for each different design of product for which approval is requested. Each application shall designate the specification under which approval is requested, including the specification revision date (year).

2.2.1 Should the applicant determine that no existing specification clearly covers the product, the request for approval shall so state and request direction from the responsible AAR technical committee for handling of such circumstances. In such situations, manufacturers must submit proposed testing criteria for review by the AAR.

2.2.2 With the approval of the responsible technical committee, previously approved product designs may be used as a basis for approval of a related product on a case-by-case basis. In instances not affecting design, material, or performance, such requests for approval must cite the product on which such a request is based. Applicant must provide details of variances from the previously approved design and include a statement to the effect that no change in design, material, or performance will be made.

2.3 Each request for approval must be accompanied by all relevant information, including drawings, calculations, material listings, test data, and other information pertinent to the approval. Drawings shall be submitted in 8 1/2" x 11" size. For drawings not submitted in 8 1/2" x 11" size, a sufficient number of copies must be provided that are folded to approximately that size (contact TTCI). All material identified as confidential or proprietary will be handled as such by the responsible technical committee and AAR and TTCI staff.

2.4 The applicant shall identify the country of origin of the product if manufactured or assembled outside North America.

2.5 If the applicant utilizes more than one facility to manufacture the product, a separate request for approval is required for each facility.

2.6 Applicant is responsible for all inspection and testing costs, including transportation and out-of-pocket expenses for the official AAR representative fee ($750 per day), and AAR service fee (see
AAR – STAGEWISE VENDOR APPROVAL

AAR Manual of Standards and Recommended Practices
Administrative Specifications

4.0 CONDITIONAL AND UNLIMITED APPROVAL

As a result of the appropriate AAR technical committee’s satisfactory review of the application and all available test or inspection results, conditional approval or approval will be granted in accordance with the individual product specification and the applicant so notified.

4.1 Conditional Approval

4.1.1 In order to provide a uniform method of evaluating service experience, the AAR often grants conditional approval of specific allotments of equipment for test in North America interchange to determine actual service performance. Reports are required to identify the number of units distributed, along with subsequent service performance experience. This information is used by the AAR in consideration of requests for unlimited approval, new location of manufacture, and changes in design or material.

4.1.2 When stipulated in the AAR letter of conditional approval, the manufacturer is required to furnish semiannually a distribution and service report that is due within thirty (30) days of the January 1 and July 1 reporting dates. The distribution portion must include the total distribution at the end of the reporting period. The service performance portion must include all known malfunctions or difficulties experienced during the reporting period, as well as the action taken to correct such difficulties or malfunctions.

4.2 Approval

In the instance where conditional approval is granted, after a two-year service test period or other period specified by the individual product specification, the manufacturer may request unlimited approval (also called “approval”). The appropriate AAR technical committee shall review distribution and service reports covering the test period, and may require further laboratory testing or inspection of field test devices. Based upon the technical committee’s review of service reports and reports of additional testing (if required), unlimited approval will be granted or denied and the applicant so notified.

5.0 WITHDRAWAL OR DENIAL OF APPROVAL

5.1 In the event that the manufacturer fails to respond to AAR correspondence within a reasonable period of time (60 days from the date of correspondence), or if the manufacturer fails to comply with the foregoing reporting requirements, the AAR may consider withdrawal of conditional approval or unlimited approval of the device, product, or equipment.

5.2 In the event that conditional approval is pending and the manufacturer fails to respond to AAR correspondence within a reasonable period of time (60 days from the date of AAR correspondence), the technical committee may terminate consideration of the application for conditional approval, with resultant denial of approval. Denial of conditional approval for this reason may require the applicant to begin the application process again and repeat all required testing if the applicant desires to gain conditional approval of the device at some future date. This determination will be made by the AAR technical committee when the subject is reopened.

5.3 The technical committee may withdraw conditional approval or approval at any time, on the basis of unsatisfactory service performance or for safety reasons. In such case, the manufacturer will be notified of the reasons for pending withdrawal of approval and afforded the opportunity to correct such deficiencies prior to withdrawal of approval.

6.0 APPEAL PROCESS

6.1 If conditional approval or approval is denied by the technical committee, the applicant will be notified of the reasons for denial. The applicant may appeal the committee’s decision by responding in writing to the AAR, Chief Technical Standards, TTCL, PO. Box 11130, 55500 DOT Road, Pueblo, CO 81001. Applicant’s correspondence must address all reasons for denial of approval.

6.2 At the request of the applicant, and at the applicant’s expense, the AAR technical committee will meet with the applicant during a regularly scheduled committee meeting or at a time desig-
# VACANCIES IN SAFETY CATEGORY

## SAFETY CATEGORY - CATEGORY WISE

<table>
<thead>
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<th>S.NO.</th>
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</tr>
</thead>
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<tr>
<td></td>
<td></td>
<td>SS</td>
<td>OR</td>
</tr>
<tr>
<td>1</td>
<td>ASMs/SMs/SSs</td>
<td>39671</td>
<td>34398</td>
</tr>
<tr>
<td>2</td>
<td>Controllers</td>
<td>2814</td>
<td>2346</td>
</tr>
<tr>
<td>3</td>
<td>Guards</td>
<td>38704</td>
<td>28078</td>
</tr>
<tr>
<td>4</td>
<td>Gateman(Traffic)</td>
<td>10061</td>
<td>9332</td>
</tr>
<tr>
<td>5</td>
<td>Switchmen</td>
<td>1405</td>
<td>983</td>
</tr>
<tr>
<td>6</td>
<td>Cabinmen</td>
<td>5140</td>
<td>4124</td>
</tr>
<tr>
<td>7</td>
<td>Leverman</td>
<td>2264</td>
<td>1695</td>
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<td>8</td>
<td>Pointsman</td>
<td>40577</td>
<td>37816</td>
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<tr>
<td>9</td>
<td>JE/SE/SSE(P.way)</td>
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<td>8042</td>
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<tr>
<td>10</td>
<td>Supervisor(P.Way)</td>
<td>236</td>
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<td>Gangmen/Gangmate</td>
<td>247758</td>
<td>206291</td>
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<td>Gateman(Engg.)</td>
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<td>ESM/MSM</td>
<td>17158</td>
<td>14221</td>
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<td>16</td>
<td>Drivers</td>
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<td>Motormen</td>
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<td>3309</td>
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<td>Shunters/ Engine Turners</td>
<td>8243</td>
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</tr>
<tr>
<td>20</td>
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<td>22</td>
<td>All other safety categories</td>
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<td>167880</td>
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<td>Total</td>
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</table>
Presentation by the Task Force on Safety
(29 Dec, 2016)

Key Findings and Recommendations

Safety Task Force
Set up by the Railway Board on December 6
Directed to recommend Short, Medium and Long Term measures.
Detailed Report being submitted shortly.
This presentation deals with Immediate and Short Term Measures (one year) to improve Safety
Go Back to Basics
Adherence to Rules, Manuals and Codes.
Work according to Rules.
No ad hocism.
Superchecks of Inspections and Work
DRMs to ensure compliance by Branch Officers and supervisors. Monitor in Weekly Meetings – Structured manner.

Inspections - Basics
Inspection Schedules to be enforced.
Simplified and focused inspection formats. (Immediate)
Computerise inspection reports for monitoring and compliance. (three months)
Safety Department to pursue key shortcomings till they are resolved.
Supercheck of Supervisor’s Work and Inspections.
Weekly Meetings of GMs/AGMs/DRM to discuss Safety First. (Immediate)
Inspections – Track & Bridges
SrDENs to inspect as per schedule, super check and monitor compliance – PWI Depots, Gang work records, USFD, Toe-load etc. (immediate)
Inspection of Yards and Bridges by SrDENs/DENs. (immediate)
Push Trolley or foot Inspections – do the full quota. (immediate)
PWIs to spend time in the field – to be cross-checked with mobile phone records. (immediate)
TMS Passwords to be given to Safety department – already ordered by Hon’ble MOSR(S). (immediate)

Track Fittings
Track fittings – perished and missing on a large scale. Take stock of situation immediately. (one month)
Typical supplies are only 15-30% of Annual Requirements. Mission Zero-Missing-Fittings: Ensure compliance in six months. To be done on war-footing. Not negotiable.

Track Maintenance
Integrated Blocks to be given by DRM's for upto 3 hours if long distance trains are not affected.
Blocks after ensuring mobilization of men, machine and material – measurable output.
Greasing of Gauge Face, outer rails on curves and both rails on Points and Crossings. (immediate)
Follow-up on Track Recording Car and OMS Readings: DRM's/GMs to monitor. (immediate)
Weigh Bridges and WILD to be in fine fettle. Exceptions to be handled with due process.
Keyman, Patrolman
The Last Frontier of Track Safety.
Special Allowance of 30% to Keyman/Patrolman to fill up these unpopular posts. *(3 months)*
Ensure Keyman and Patrolman have tools and equipment. *(immediate)*
Theft reporting by Keyman to be facilitated. *(immediate)*

Re-organise Field Offices
Sectional SrDENs/DENs to be relocated to their Sections with full office support. *(one month)*
In many cases the Sectional SrDEN/DEN has to travel 2-8 hours just to set foot in his area.
Likewise, DSTEs/ASTEs/AME(C&W) to be relocated to major work areas. *(one month)*
System already exists for Mechanical and Electrical Shed Officers, some S&T Officers too. Area Officers exist in Operating Deptt.

Rolling Stock – 1
Rolling-in Examination: Last opportunity check for rolling-stock defects.
Build proper rolling-in examination huts. Provide bright lighting. *(six months)*
No operations with expired BPC. Not negotiable. *(immediate)*
TXR Certificate RS-7: to be cross checked by officers. *(immediate)*
Rolling Stock – 2

Lighting and Drainage improvement in Pitlines – Mission Mode (3 months)
Freight Train Examination Lines to be Audited by DRMs – Proper Lighting, Pathway and Welding Facilities to be provided. (audit: one month, improvements: one year)
Corrosion Repair Practices in Workshops to be Audited. (3 months)

SPAD – 1

No Breach of Rest for Crew (immediate)
Mandatory 6-hour rest in Running Room before booking for duty after Periodical Rest and Long Leave. (immediate)
Link CMS with Biometrics and Breath Analysers (3 months)
IIT-KGP Video Test to be introduced (3 months)
Counselling, foot-plating by Loco Inspectors. Check TA Bills with Mobile Phone Records. Exemplary Penalties in case of false claims. (immediate)

SPAD – 2

Speed Limit at Caution Signal (Single yellow) to 45kmph. (GR 3.07) (one month)
All Boards (caution, signal sighting, OHE Masts, Signal Posts etc.) to be Replaced with Retro-Reflective Ones (six months)
Ambush Checks on Drivers – LPs not to presume signals.
20-30% of Walkie-Talkies are out of order. Repair them all. (three months)
Air-condition ALL running rooms (one year)
Shunting (Immediate)

Shunting to be done as per GR & SR Provisions.
No Use of Walkie Talkie – Only Flags and/or lamps.
Ensure proper fitting cotters.

Points and Crossings

Two thirds of all derailments happen in yards.
Joint Inspection of Points and Crossings by PWay and Signal in right earnest – no instances of 30-40 inspections in a day.
Inspection Register to be super-checked by Engg. and S&T Officers for concordance with site conditions.

Safety Items

Directorates to (re)issue fresh lists of Safety, Must Change and Vital items. (one month)
Ensure 100% Availability of Safety, Vital and Must Change Items – in Mission Mode. (six months)
Divisional and Depot Purchase Officers to be empowered to same level as HQ Purchase Officers – to buy stock and non-stock items without restrictions. (one month)
Cash Imprest of Field Officers (Engg, Mech, Elect, S&T) to be increased to Rs. Ten Lakhs per month. Permit to buy Stock and non-Stock Items. GFR Rules to Apply. (one month)
Near Misses – New Paradigm
Near Misses are Warnings we must pay heed to.
Heinrich Triangle – For every accident, there are 29 near-misses.

Near Misses
Incidents as reported to Controllers must be captured. Any subsequent data is doctored.
Seek information from Field on Near Misses.
  Inattentive Station Masters – non-exchange of alright signal
    Gatekeepers not-alert or missing from post.
Malfunctioning signals, wrong caution orders.
To be discussed/monitored by DRMs/GMs. (immediate)

Thank You
Let’s Go Back to Basics

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