CHAPTER XVI

LEVEL CROSSINGS

16.01 Knowledge of Signals––
No person shall be appointed to be a Gateman unless he has a knowledge of signals.

16.02 Supply and care of equipment––
Every Gateman shall

(a) be supplied with day and night hand signals, detonators and other prescribed equipment and

(b) keep such signals, detonators and other equipment in proper order and ready for use.

16.03 Road Traffic––

(1) Subject to such special instructions in that behalf as are permitted by these rules, all gates at level crossings shall be kept constantly closed and securely fastened across the thoroughfare on both sides of the Railway and shall only be opened when it is necessary and safe to open them for the passage of road traffic.

Provided that any Railway Administration may from time to time issue special instructions for any particular level crossing or class of level crossing and may by such special instructions permit the gates at any level crossing or class of level crossing to be normally kept open to road traffic and may therein prescribe the conditions under which gates are to be kept closed against road traffic for the passage of a train or trains or for the purpose of any other railway operation and all such special instructions so long as they be not cancelled or superseded shall for the purposes only of the Railway Administration issuing the same be deemed to be General Rules within the meaning and subject to the provision of section 60 of the Act.

(2) If for any reason the gates at level crossings cannot be so closed / fastened across thorough fares on both sides of the track, action to prevent the approaching trains, if any, from running into the gate may be taken in accordance with stipulations laid down under Rule 16.06.

(3) Gatemen, where provided, shall at all level crossings be prepared, whenever such level crossings be open to road traffic, to show a Stop hand signal to any approaching train.

(4) Where no Gateman is specially provided for night duty at a level crossing, the gates there at shall, subject to special instructions, be locked at night and opened only to pass road traffic in such manner as may be prescribed by special instructions.

16.04. Gateman to observe passing trains—

Except where otherwise prescribed under special instructions, the gatemen shall observe all passing trains and be prepared to take such action as may be necessary to ensure safety of trains.

16.05 Channel for flange of wheels––

The Gateman shall see that the channel for the flange of the wheels is kept clear.

16.06 Defects at level crossings––

If any gate or the fastenings thereof, or any fixed signal pertaining to the gate becomes out of order, the Gateman shall:—

(a) take action to close the gate, if possible, against the road traffic

(b) after closing the gates, hand signal the train movements past the level crossing,

(c) if the gates cannot be so closed, put the banner flag or level crossing flag in such manner as to warn the approaching train to stop short of gate and thereafter hand signal the train.

(d) report the fact to his superior or the nearest Gangmate.

16.07 Obstructions at level crossings––

Every Gateman, on noticing any obstruction on the line, shall at once remove it or if unable to do so, shall:—

(a) take action to ensure that the fixed signals, if any, protecting the gate are kept at 'on'

(b) show Stop hand signal and do his best to stop approaching trains and

(c) shall protect the obstruction as per Rule 3.62.

16.08 Parting of a train—

If a Gateman notices that a train has parted, he shall not show a Stop hand signal to the Loco Pilot, but shall endeavour to attract the attention of the Loco Pilot and the Guard by shouting, gesticulating or other means.

16.09 Trespassing—

Every Gateman shall, as far as possible, prevent any trespassing by persons or cattle.

16.10. Transfer of Charge of Gate—

Except in accordance with special instructions, no Gateman shall leave his gate unless another gateman has taken charge of it.

16.11 Height gauges—

(1) Adequate arrangements shall be made to erect height gauges on either side of the overhead equipment or other equipment at every level crossing so as to ensure that all vehicles and moving structures passing under the height gauge also pass under the overhead equipment or other equipment with adequate clearance.

(2) The adequate clearance referred to in sub-rule (1) shall be sanctioned under approved special instructions.

(3) Vehicles and moving structures, which cannot pass under the height gauge without striking or touching it, shall not be permitted to pass the overhead equipment or other equipment except in accordance with special instructions.

CHAPTER - XVII

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WORKING OF TRAINS ON ELECTRIFIED SECTIONS OF RAILWAYS

17.01 Applicability of General Rules—

All rules referring to the working of trains shall also apply to electrified sections except as otherwise provided in the rules contained in this Chapter.

SR 17.01.1.1.All subsidiary Rules and Special instructions which control the movement and operation of diesel trains shall also apply to the movement and operation of electric trains, except as otherwise provided for in these rules.

1.2.1. All officials connected with movement of electric rolling stock shall have a thorough knowledge of these rules. They shall also be responsible for ensuring that staff working under them are thoroughly conversant with the instructions relating to their work and the correct procedure to be followed under normal conditions as well as in an emergency.

1.2.2 Every Railway servant, supplied with these rules shall make himself thoroughly acquainted with the rules and shall be held responsible for knowledge of and compliance with them.

17.02 Special definitions applicable to this chapter—

In these rules, unless the context otherwise requires.

(1) 'Electrical way and works' means the traction installations including overhead equipment and other connected works provided on the electrified sections of the railway.

S.R. 17.02.1.1. Electrical equipment means any apparatus used for generation, transmission or utilisation of electrical energy.

1.2. Transmission line means cables or bare over head conductors by means of which electrical energy is transmitted between various points of a distribution system.

(2) 'Feeding Post' means a supply control post, where the incoming feeder lines from grid sub–station are terminated.

SR. 17.02.2.1 Feeder 'means a conductor connecting (a) a generating station with a sub–station or feeding point, or (b) a sub–station with a feeding point.

2.2 Feeder also means a conductor connecting, a supply control post to a grid sub–station, and a supply control post or switch gantry to a feeding point. Feeder also includes a conductor connecting OHE to switching station.

(3) 'Neutral section' means a short section of insulated and dead overhead equipment which separates the areas fed by adjacent sub–stations or feeding posts.

3.1 Neutral section is provided mid–way between two consecutive sub–stations.

(4) 'Power block' means blocking of a section of line to electric traffic only.

(5) 'Supply control post' means an assembly of interruptors, isolator switches, remote control equipment and other apparatus provided for controlling power supply to overhead equipment. It includes feeding posts, sectioning and paralleling post, sub–sectioning and paralleling posts and sub–sectioning posts.

S.R.5.1 'Interruptors' means a single phase oil circuit breaker without an automatic tripping device.

5.1.1 'Bridging Interruptor' means an interruptor which is provided at a neutral section to enable one sub–station to feed a sector of the overhead equipment normally fed by another sub–station during emergencies or when the latter is out of use. This interruptor normally remains in the open position.

5.1.2 'Sectioning Interruptor' means an interruptor which connects adjacent sub–sectors together to maintain continuity of supply. This interruptor normally remains in the closed position.

5.1.3.'Paralleling Interruptor' which connects over head equipment of two different tracks. This interruptor normally remains in the closed position to reduce voltage drop.

5.2. 'Switch Electrical' means a device for opening or closing an electrical circuit.

5.2.1. 'Switch Alternate Feed' means a switch used for connecting the overhead equipment of a loop or siding or cross-over to alternative sections of the overhead equipment.

5.2.2.' Switch, Double-pole, Gang-operated, Earth type' means a special switch used in electric loco sheds, for feeding two sections or for making one section dead and earthing the other.

5.2.3. 'Switch, interconnecting section or Isolator' means a switch used for connecting or disconnecting adjacent elementary sections of overhead equipments.

5.2.4. 'Switchgear" means Isolator Switches, Circuit breakers, interruptors, cut-out and other apparatus used for the operation, regulation and control of electrical circuits.

5.3.1. 'Remote Control Centre' means the centre from which, the equipment at various supply control posts are remotely controlled, by the TPC.

5.3.2. 'Remote Control Cubicle' means a room in a supply control post in which remote control equipment and batteries are erected for remote operation of switchgear located at the post.

5.4. 'Section insulator' means a device for dividing a contact wire into electrical sections while maintaining mechanical continuity and a continuous path for pantograph.

5.5. 'Sector' means a section of overhead equipment of a track from a feeding post to sectioning post.

5.5.1. 'Sub-sector' means the shortest section of overhead equipment which can be isolated by opening of interruptors.

5.5.2. 'Elementary Sections' means the shortest section of overhead equipment which can be isolated from the rest of the system by switching operation.

Supply control post:

5.6.1. 'Feeding post (FP)' means a supply control post where the incoming feeder lines from grid sub-station are terminated.

5.6.2. 'Sectioning and Paralleling post (SP)' means a supply control post situated midway between two feeding posts at neutral section and provided with bridging and paralleling interruptors.

5.6.3. 'Sub-sectioning and paralleling post (SSP)' means a supply control post where sectioning and paralleling interruptors are provided.

NOTE:- Sub-sectioning post (SS) – These are provided only occasionally. They are similar to SSPs with sectioning the OHE, but not paralleling. This is a supply control post where only sectioning interceptors are provided.

17.02.(6) 'Tower wagon' means a self-propelled vehicle which is used for the maintenance and repairs of over head equipment.

17.02. (7) 'Traction power controller' means a Competent Railway servant who may for the time being be responsible for the control of power supply on the traction distribution system.

S.R.7.1. 'Traction power controller (TPC)' means an official who is responsible for ensuring continuity of power supply and operations appearing thereto on the traction power distribution system. He co-ordinates the requirements of traffic and electric power supply and arrange for the issue of permit to work on or adjacent to overhead lines, cables and switchgear connected thereto.

7.2. Section Controller (SCOR) means an official of the operating department appointed to co-ordinate the movement of trains over a specified section of the Railways.

7.3.Additional definitions.

7.3.1. Apparatus' means electrical apparatus and includes all machines, fittings, accessories and appliances in which conductors are used.

7.3.2. 'Assistant Loco Pilot' means the duly certified Assistant Loco Pilot of a Single or Multiple unit train or of an electric engine.

7.3.3**. '**Assistant electrical Engineer / Traction Distribution (AEE/Tr.D)' means an Assistant Executive Officer-in-charge of maintenance and repairs of the power distribution system in a division or in an area and responsible to the DEE/Tr.D.

7.3.4. 'Assistant Electrical Engineer/Rolling Stock (AEE/RS)' means an Assistant Executive Officer-in-charge of maintenance and repairs of electrical rolling stock in a division or in an area and responsible to the DEE/RS.

7.3.5. Assistant Traction Foreman (ATFO).

7.3.5.1. 'ATFO/OHE' means a subordinate of the area concerned responsible to the Traction Foreman for inspection and maintenance of traction overhead lines, rail bonds and for the staff employed thereon.

7.3.5.2. 'ATFO/RS' means a subordinate of the area concerned responsible to TFO/RS for the maintenance of electric rolling stock and for the staff employed thereon.

7.3.6. 'Authorised person' means any person who is duly authorised to perform the duties pertaining to his employment, the authorisation being by an officer of the railway administration empowered for that purpose.

7.3.7. 'Bare' means not covered with any insulating material.

7.3.8. 'Brake valve' means a valve which operates the automatic brake of the train.

7.3.9.1. 'Cable' means a length of insulator single conductor or two or more of such conductors, (solid or stranded) each provided with its own insulation, which are laid up together.

7.3.9.2. Such insulated conductor or conductors may or may not be provided with an overall mechanical protective covering/armoring.

7.3.9.2. 'Transmission line' means cables or bare overhead conductors by means of which electricity is transmitted between various parts of a distribution system.

7.3.10. 'Conductors' means a body or substance which offers a low resistance to the passage of an electric current.

7.3.10.1. 'Phase Conductor' means a conductor which carries current to the traction overhead equipment.

7.3.10.2. 'Return Conductor' means a conductor which carries return current from the tracks to the sub-station. Return conductor also includes carrying return current from booster transformer to the track.

7.3.11. 'Caution Notice' means a notice attached to or placed in the danger zone of live equipment calling attention to the danger of touching or interfering with such equipment and bearing the words 'Caution-Live Equipment'.

7.3.12. 'Chargeman' means an authorised person in charge of a Gang of workmen, authorised to work on specific types of traction equipment such as overhead equipment, supply control posts, feeder lines remote control equipment, electric rolling stock etc.

7.3.13. 'Circuit' means an arrangement of conductor or conductors for the purpose of conveying electrical energy and forming a system or a branch of a system.

When they form a closed path through which a current can circulate, the circuit is referred to as closed. When the path is not closed, the circuit is referred to as 'open'.

7.3.14. 'Circuit breaker' means a device for closing and opening an electrical circuit under all conditions unless otherwise specified and so designed as to open the circuit automatically under abnormal conditions.

7.3.15. 'Competency certificate' means a certificate issued to a person by the railway administration authorising him to carry out specified duties pertaining to his employment.

7.3.16. 'Contact wire' means an overhead conductor from which electric power is supplied to electric rolling stock.

7.3.17. 'Cut-out (fuse)' means any appliance for automatically interrupting the transmission of energy through any conductor when the current rises above a pre-determined value.

7.3.18. 'Danger' means danger to health or to life or any part of the body from shock, burn or other injury to persons, or property, or from fire or explosion, attendant upon transmission, transformation, convertion, distribution or use of electrical energy.

7.3.19. 'Danger Notice' means a notice attached to dead equipment to convey a warning against such equipment being made alive and bearing the words 'Danger-Men Working'.

7.3.20. 'Danger Zone' means the zone, lying within 2 metres of any live equipment in which no work is permitted, when the equipment is live. Notwithstanding the above, the Loco Pilot of an electric loco is permitted to change the head light bulb of the loco while standing on the buffer beam projection at the floor level of the cab.

7.3.21 .'Dead equipment' means any electric equipment which is not electrically live.

7.3.22. 'Dead Man's handle' means an emergency safety device fitted in the handle of a master controller which when released, automatically cuts off the supply of electrical energy to the traction motors and applies the brakes.

7.3.23. Distribution system' means system of electrical equipment by means of which electrical energy in the form of alternating or direct current is distributed over a given area.

7.3.23.1. 'Traction power distribution system' means distribution system provided for traction purposes.

7.3.23.2. This is also referred to as "Power Distribution system".

7.3.24. 'Divisional Electrical Engineer/Traction Distribution (DEE/Tr.D)' means an executive officer responsible for the traction power distribution system including power supply arrangements and remote control equipment in a division or in an area.

7.3.25.'Divisional Electrical Engineer/Rolling Stock (DEE/RS)' means an executive officer responsible for the electric rolling stock in a division or in an area.

7.3.26.'Loco Pilot' means the duly certified Loco Pilot of a single or multiply unite train or of an electric engine. This definition is in addition to the definition given in GR.

7.3.27. 'Driving Trailer' means a coach which has a driving compartment and which is not a motor coach.

7.3.28. 'Dropper' means a fitting used in overhead equipment construction supporting the contact wire from the catenary.

7.3.29. 'Earth' means the conducting mass of the earth or of any conductor in direct electrical connection therewith.

7.3.29.1'Earthed' or Connected to earth' means connections with the general means of earth in such a manner as to ensure at all times an immediate discharge of energy without danger.

7.3.29.2. 'Earth' for the purpose of the overhead equipment only includes the track return circuit and the structures supporting the overhead equipment, provided such structures are connected to earth or track return.

7.3.29.3. 'Electrical equipment' means any apparatus which is used for generation, transmission or utilisation of electrical energy.

7.3.30. 'Electrified Track' means track provided with overhead equipment.

7.3.31. 'Emergency Telephone' means a telephone circuit provided for connecting the TPC.

7.3.32. 'Grid sub-station or sub-stations' means an electrical installation equipped with transformers and switchgear from which power is supplied for electric traction.

7.3.33. 'Guarded' means covered, shielded, fenced or otherwise protected by means of suitable casing, barrier, rails or metal screens to remove the possibility of dangerous contact or approach by persons or objects to a point of danger.

7.3.34. 'High Voltage' means a voltage which under ordinary working conditions may exceed 650 volts.

(i) 'Voltage' means the difference of electric potential measured in volts between any two conductors or between any part of either conductor and the earth as measured by a suitable voltameter.

7.3.35. 'Independent air-brake handle' means a removable handle controlling independent air-brake apparatus of electric engine.

7.3.36. 'Insulated (Air-gap) overlap span' means an arrangement of overhead equipment over a track where two sets of traction conductors overlap each other for a short distance, providing for a smooth passage for the pantographs of electric rolling-stock, the two sets of wires being insulated from each other by an adequate air-gap.

7.3.37. 'Insulator or insulating material' means material which offers relatively high resistance to the passage of an electric current.

7.3.38.'Linesman' means a person authorised to inspect and work on the overhead lines and switches in relation therewith.

Note: He is the lowest grade employee who is allowed to enter an unattended supply control post unaccompanied by his superior.

7.3.39.1. 'Live equipment' means any electrical equipment which is electrically live.

7.3.39.2. Electrical equipment is live when a difference of potential exists between it and earth or when it is connected to another conductor or circuit in which such a difference of potential exists.

7.3.40.'Master Controller' means a controller in the driving compartments of electric engines, motor coaches and driving trailers, which are not included in the main circuit of the controlled motor or motors but which operate other controller or contactors by means of control circuit thereby controlling the supply of electrical energy to the Traction Motors.

7.3.41. 'Motor Coach' means a coach equipment with traction motors and with the necessary control and power apparatus for operating them.

7.3.42. 'Multiple Unit train' means a train consisting of two or more single unit trains coupled together and operated as one train.

7.3.43. 'Off position' means the position of the reversing handle whereby a master controller is locked 'off' and where by the deadman's handle, if provided, is rendered ineffective.

7.3.44. 'Operator' means a person on duty who is incharge of a supply control post.

7.3.45. 'Overhead equipment' means the electrical conductors over the track together with their associated fittings, insulators and other attachments by means of which they are suspended and registered in position.

Note: All overhead electrical equipments, distribution lines, transmission lines and feeders may be collectively referred to as 'Overhead lines'.

7.3.46.'Pantograph' means a collapsible device mounted on and insulated from the roof of an electric engine or motor coach and provided with means of collecting current form the overhead equipment .

7.3.47.'Permit to work' means a form of declaration signed and given by an authorised person to a person incharge of work to be carried out on or adjacent to any electrical equipment, for the purpose of making known to such person exactly what equipment is dead, earthed and safe to be worked on or adjacent to.

7.3.48.'Rail Bond' means an electrical connection across a joint in or between adjacent lengths of rail.
7.3.48.1. 'Bond continuity' means a rail bond used for maintaining continuity of the rail return circuits at points and crossings.
7.3.48.2. 'Bond cross' means a rail bond used for connecting together two rails of a track or rails of adjacent tracks.
7.3.48.3. 'Bond Joint' means an electrical connection across a joint between two adjacent lengths of rails as part of the track return.
7.3.48.4.'Bond structure' means an electrical connection between the steel work of a track structure, bridge or station building, to which the traction overhead equipment is attached, and the track return.
7.3.48.5.'Bond Impedence' means a special rail bond used to bridge an insulated rail Joint in AC track circuited sections in area equipped for electric traction.
7.3.49. 'Reversing handle' means a handle which controls the forward and reverse running of the traction motors and is fitted in such a manner that it can only be removed when the master controller is locked 'off'.
7.3.50. 'Single Unit Train' means the combination of a motor coach or motor coaches adopted by a railway administration as an operating unit.
7.3.51. 'Track return' means the track rails when used as the return conductor for the traction return current to the sub–station.
7.3.52. 'Traction ' means electric traction.
7.3.53.'Traction engine examiner' means an official responsible for inspection and maintenance of electric rolling stocks.
7.3.54. 'Traction Foreman (TFO)'.
7.3.54.1.'Traction Foreman/Overhead Equipment (TFO/OHE)' means a subordinate for the area concerned responsible for the operation and maintenance of the overhead equipment and for the staff employed thereon..
7.3.54.2.'Traction Foreman/Rolling stock (TFO/RS)' means a subordinate responsible to AEE/RS for the maintenance and/or inspection of electric rolling stock and for the staff employed thereon.
7.3.55. Traction Loco Controller(TLC)' means an official under the control of AEE/RS who will be responsible for booking of electric locomotives and running staff to meet the requirements of the traffic.
7.3.56. 'Traffic Block' means blocking of a track against movement of all traffic over a particular section.

17.03 Inspection of electrical way and works––

The electrical way and works shall be inspected regularly in accordance with special instructions by officials nominated for the purpose and in accordance with the duties assigned to them.

SR. 17.03.1. Electrical way and works –
Railway servants employed on electrical way and works shall observe all General Rules 15.01 to 15.17, 2.05, 4.07 and 6.10 inclusive wherever applicable to electrical way and works except as otherwise provided in the rules contained in this chapter, and the Railway Administration shall prescribe on whom the duties of Inspector of way and works and the duties of Ganger devolve in each case together with any additional requirements thereto.
2.1. The duties of the PWIs as stipulated in the General Rules inclusive, wherever applicable to electrical way and works shall devolve on the TFO/OHE and ATFO/OHE in so far as these duties relate to the respective items of electrical way and works in their charge.

2.2. The duties of the Gangmate wherever applicable to overhead equipment, shall devolve on the overhead equipment Linesman.

2.3 If due to any defect or damage to the overhead equipment, it is necessary to lower pantograph over any particular section of the running lines, the traction official concerned shall communicate with the TPC who in turn shall advise the SCOR for arranging the issue of necessary Caution Orders by the Staion Master to the Loco Pilots concerned as per rules in force. The Caution Order shall specify the exact kilometreage and structure numbers between which the Loco Pilot shall lower the pantographs and coast through. In addition the Traction official asking for the Caution Order to be issued, shall arrange with the ATFO/OHE for the exhibition of suitable indication boards marking the beginning and ending of the affected section in which the Loco Pilot shall coast through with lowered pantograph.

3.1. Overhead communication circuits - Adequate arrangements shall be made to Guard communication or electric lighting circuits crossing or running in close proximity to the overhead equipment.

3.2. No conductor shall be erected over or alongside an electrified track, unless it is adequately guarded in accordance with the rules laid down for the purpose by the Railway Administration. This guard shall be effectively connected to earth.

4. Inspection of Electrical Equipment - All electrical equipment shall be inspected regularly, in accordance with special instructions.

4.1 The inspection of overhead equipment and electrical equipment at supply control posts, shall be carried out periodically in accordance with instructions issued by the DEE/Tr.D.

4.2 Electrical Equipment in rolling stock shall be inspected periodically in accordance with instructions issued by the DEE/RS.

4.3.1. Engine crew of all trains shall be vigilant and keep a sharp look out while the train is in motion and watch the overhead equipment and report any defect noticed to the TPC/SCOR.

4.3.2. When a defect on the overhead equipment which is likely to interfere with the smooth movement of the pantograph or cause damage to it, is noticed ahead, the Loco Pilot shall trip the circuit breaker and immediately lower the pantograph by placing the pantograph handle in the ‘lower’ position. An emergency stop should be made, if necessary.

4.3.3. If the damage to overhead equipment is slight such as a slight break away of the contact wire from the droppers or catenary, it may be practicable to coast under the defective section, but the defect shall be reported to the TPC through the nearest emergency telephone circuit or in case this circuit is not available through any other telephone.

4.3.4. In case of a major breakdown to overhead equipment requiring trains to be stopped, the Loco Pilot noticing such a breakdown, shall advise the TPC through the nearest emergency telephone circuit giving details of the breakdown and in case this circuit is not available, convey the information through the nearest Station Master on any other telephone circuit. The TPC, on receipt of such a message, shall pass on suitable instructions to the SCOR and if necessary, advise him to stop running of trains in the affected section.

4.4.1. All break-down or defects noticed in the overhead equipment or in any other traction equipments, including continuity bonds, joint bonds, cross bonds, structural bonds by any Railway servant, shall be reported immediately to the TPC. In case he cannot be contacted, the nearest Station Master or TFO/OHE or the AEE/Tr.D shall be advised. The Station Master to whom such breakdown or defects are reported, shall convey the information immediately to the TPC through the SCOR. In case of failure of communications, he shall use his discretion regarding movement of traffic and advise the nearest Traction official.

4.4.2. In case of breakage of an overhead line, the Railway servant detecting it shall ensure that no person comes in contact with the line until an authorized person arrives on the spot. The authorized person shall take immediate action to make the affected line dead and earthed.

4.4.3. In the event of break of contact wire of the over head electrical equipment, the following precautions shall be taken for the safe working of signalling equipment—

4.4.3.1. The TPC/SCOR on receipt of an advice of break in traction overhead lines or confirmation of such an advice from the TPC shall immediately advise by the quickest possible means all the staff responsible for the maintenance and operation of the signalling equipment of the section where the catenary/contact wire has broken.

4.4.3.2. The staff responsible for the operation of the signalling equipment of the section shall immediately check whether the block and other signalling equipment are working normally. If an abnormal working of any equipment is noticed, its working shall be immediately suspended and necessary action under the rules shall be taken.

4.4.3.3. On receipt of this information the staff responsible for the maintenance of signalling of the section shall immediately proceed to the site and test all circuits and allied equipment paying particular attention to the out-door signalling gear to ensure that no damage to it has taken place. An authorized representative of the S&T department shall submit a certificate that everything is working all right and send it to his superiors along with a detailed test report as soon as possible.

4.5.1 All overhead line staff, when on patrol, shall watch the pantographs of passing electric rolling stock and if any defects are noticed, they shall report them to the TPC through the emergency telephone circuits or any other telephone, if emergency telephone circuit is not available, giving full particulars including the number of the electric rolling stock, the location of the defect and the time when the defect was noticed.

4.5.2. The TPC shall communicate reports of a defective pantograph to the TLC who shall arrange to have the electric rolling stock stopped as soon as possible, for examination of the defective pantograph.

4.6. TFO/OHE shall be responsible for the proper and efficient maintenance of all breakdown equipment, wiring trains, tower wagons, breakdown lorries, etc., so that they are always in a state of good repair. He shall ensure that they are equipped with full quantities of stores and spare parts as per approved inventory. All tools, tackles, straining screws, clamps, ropes and ladders shall be maintained in good condition and ready for use at all times.

4.7. The staff concerned shall ensure that the equipment not in immediate use is always ready for service, except such equipment which may be under repair or overhaul.

4.8. The supply of power may be interrupted due to fault in the overhead equipment in a switching station or a sub-station. When failure occurs, the TPC shall be informed at once over the control telephone. Full information shall be given on such occasions and if it is known that the fault is on the overhead equipment or on a cable, all particulars shall be given including the exact location of the fault and how it occurred. The TPC shall immediately, on receipt of such information, inform the CHC and make necessary arrangements for isolating the faulty section. He shall also inform the SCOR of the action taken by him and advise which section of the line is not available for working of electric trains.

4.9. Special precautions by SCOR, Station Master and train crew on electrified sections when a section of OHE is found faulty.

4.9.1. When a train comes to a stop in an electrified section and the cause of stoppage is not immediately obvious, the Loco Pilot and Guard shall immediately take action to protect the train in accordance with the rules made under G.R. 6.03 and SRs there under .

4.10.1. In the event of any OHE failure on a Multiple line section for any reason and the OHE relating to the other line is in working order, 'Single Line' working is introduced in terms of procedure detailed under S.R.6.02.1.

4.10.2. There may be occasion when this failure or tripping of OHE could be due to some accident and/or obstruction affecting the other tracks etc., also. If no adequate precaution is taken for running of this train on the other lines, there is a possibility of train/trains running into derailed wagons/coaches from the adjacent line/lines and/or some other obstruction causing side collision or derailment. To obviate this possibility, it has been decided that instructions as indicated in S.R. 17.09.16 should be followed by all concerned strictly with immediate effect.

4.11. In order to reduce chances of collision on adjacent lines in electrified territory in case of an accident taking place on the other line, speed of the first train entering the section, from opposite direction where tripping has taken place for any reason, should be restricted to 35 Kmph during day and 20 Kmph during night after the section has been identified and isolated by the TPC.

5.1. Access to Electrical equipment-

5.1.1. Adequate precautions shall be taken to prevent unauthorized persons gaining access to electrical equipment. Such precautions shall be prescribed by the Railway Administration.

5.1.2. No unauthorized person shall be permitted to have access to or to operate any switch or other apparatus which forms part of the Electrical equipment or is used in connection therewith.

5.2.1. The keys for all outdoor switches shall be kept locked in glass fronted box in the custody of the Station Master or other authorized person stationed conveniently nearby the switches. The keys shall be issued on demand only to authorized persons, whose signatures for receipt shall be obtained in a book maintained for this purpose.

5.2.2.1. All chambers or enclosures containing live equipment shall be kept normally closed and locked, with the keys in the custody of the authorized person. A duplicate key shall be kept in a box with a fixed glass fronted cover in place notified by the DEE/Tr.D. The key may be removed by breaking open the glass cover of the box in case of emergency, by an authorized person. A record shall be maintained of every such use of the key.

5.2.2.2 In the event of breaking the glass of box, the key or keys shall be kept in the safe custody of the Station Master until the glass is replaced. The TPC shall keep a record as to where such keys are kept, so that in case of emergency, he will be able to direct the staff concerned.

5.2.2.3. When the glass cover is broken for taking out the duplicate key, the concerned Traction Foreman/OHE, shall be immediately advised to replace the glass. The person replacing the glass, shall obtain the signature of the authorized person who shall record the date of replacement of the glass.

5.2.3. Any person while working in a chamber of enclosure containing electrical equipment, which under normal conditions is live shall retain the keys of the chamber or enclosure. These keys shall be returned to the person in whose custody they are normally kept, immediately after the chamber or enclosure has been locked.

5.2.4. Permit-to-work cards shall not be cancelled until the keys have been returned to the box or to the person in whose custody they are normally kept.

5.3.1. In an emergency, the Station Master shall operate such switches as per specific direction of the TPC.

5.3.2. In the event of a fault in the overhead equipment necessitating isolation of a section in addition to the faulty one, the ATFO/OHE or an authorised person shall

arrange with the TPC, to isolate the healthy section also. However if necessary he shall himself open those switches which can be operated conveniently.

5.3.3.1. Should the TPC wish to have any isolator switch opened or closed he shall ask the ATFO/OHE or Station Master or any authorised person to carry out the required switching operation. The person concerned shall after carrying out the orders, lock the switch either in 'open' or 'closed' position as the case may be and inform the TPC of the action taken. He shall not part with the key until receipt of further orders from the TPC. A record of such operation shall be maintained by the person concerned.

5.3.3.2. The instructions regarding the parting with the keys shall be confirmed by exchange of PNs.

5.3.4. Every Station Master shall be fully aware of the location of the isolator switches provided for the control of power supply to overhead equipment at the station or near the cabin and shall be conversant with the correct method of opening and closing the same in an emergency.

The Station Master who holds a certificate of competency for operating the overhead switches issued by he DEE/Tr. D or his authorised Inspector, shall only be posted at such stations where these switches have been provided. The Station Masters shall be examined for their competency in operating these switches once in three years (see SR 17.09.1.3)

5.4. No person other than authorised maintenance staff, their assistants when accompanying them and persons provided with special permits issued by DEE/Tr. D, shall be admitted to supply control posts except the following:

5.4.1. A person escorted by the DEE/Tr.D or by the AEE/Tr. D.

5.4.2. A doctor summoned to attend to an accident case.

5.4.3. Electrical Inspector of the Government for the railway area concerned.

5.4.4. A person required by an officer to speak from a telephone installed in the premises.

5.5. No person lower than Linesman in rank, shall be allowed to enter an unattended supply control post alone.

17.04 Permit-to-work on electrical equipment––

If work is to be carried out adjacent to the electrical equipment or any other part thereof by other than the competent railway servant, such work shall be done only when and for such time as the person-in-charge of the work has obtained a written permit-to-work, duly signed and given by the Railway servant authorized for the purpose by special instructions. He, in turn, shall issue the same only with the knowledge of the Traction Power Controller.

S.R.17.04.1. Permit-to-work on Electrical equipment and on works adjacent thereto.

1.1. If work is to be carried out adjacent to the electrical equipment or on any part thereof by other than authorised persons, such work shall be done only when and for such time as the person-in-charge of the work is in possession of written permit-to-work. Permit–to-work shall be obtainable on application in accordance with special instructions.

1.2 "Permit-to-work' shall only be issued by such authorised persons who are specially empowered for this purpose by the Railway administration. 'Permit-to-work' shall only be issued with the knowledge of the person who is responsible for the operation of Power supply on the distribution system.

1.3 A duplicate of every 'Permit-to-work' issued shall be retained in the personal possession of the authorised person issuing it for the period prescribed by the Railway administration.

2. Before commencing work and for the whole time that the work is being performed on any part of the electrical equipment or adjacent hereto, that part of the electrical equipment shall be made dead and earthed, save and except as provided in these rules. A 'Permit-to-work' shall be obtained from the TPC or an authorised person in accordance with paras 5.6.10 and 11 in the prescribed form and also see para 17.

3.1. All Departments in the electrified area which require traffic blocks, power blocks or 'permit-to-work' in the danger zone of traction equipment or who require overhead line staff and/or bonding staff to present at site for scheduled maintenance works, shall give notice sufficiently in advance to the DEE/Tr.D which in any case shall not be later than 10 hours every Monday morning, in the prescribed form showing—

3.1.1. the nature of the work and the date and time on which it is to be performed.

3.1.2. by whom the work is to be carried out.

3.1.3. location of the work and the section of the lines to be blocked.

3.1.4. the trains between which the block is required and

3.1.5. whether the track will be available for diesel traffic.

3.2 The requirements of all departments for traffic block/power blocks and 'permit-to-work' shall be coordinated by the office of the DEE/Tr.D in consultation with the DOM and a consolidated statement forwarded to the DOM concerned, by 12 hours on every Wednesday for inclusion in the weekly programme of traffic and power blocks.

3.3. Works of an urgent nature shall be attended to by obtaining emergency blocks and 'permit-to-work' from the TPC.

3.4.A weekly programme of work involving traffic blocks, power blocks and 'permit-to-work' shall be prepared in the office of DOM and despatched to all concerned by Friday evening, for the week commencing on the following Monday.

Note:- The procedure detailed in paras 4, 5 and 6 shall be followed for obtaining the power block and 'permit-to-work' in each case as prescribed, even though the work is included in the weekly programme.

4.1. When a power block has been sanctioned, the TPC shall issue to the SCOR a power block message (in the prescribed from) in duplicate either through a messenger or by telephone with exchange of PNs. The SCOR shall obtain confirmation from the Station Master that the section will be blocked for electric traffic. He shall then, either return one copy of the written message duly acknowledged indicating thereon the time from which the block will be given or send a phone message to the TPC giving the same information supported by a PN. The TPC shall thereafter arrange to isolate and make dead the portions of electrical equipment concerned at the time indicated by the SCOR and issue a 'Permit-to-work' thereon, as detailed in paras 5 and 6 below.

4.2. However, in case of an emergency, the TPC shall switch off the power first and then, advise the SCOR of the power block imposed and reasons for doing so.

4.3. When 'Permit-to-work' on the electrical equipment has been cancelled and the TPC has restored normal conditions, he shall cancel the power block message issued to the SCOR, either by giving a cancellation message in duplicate or by telephone with exchange of PNs.

5. Method of obtaining 'permit-to-work' in the danger zone of overhead equipment for work by authorised persons.

5.1. Except as detailed in SR.17.04.10, permit-to-work shall be obtained by authorised persons from the TPC, who shall carry out (through remote control) or order the switching operations necessary to isolate the portion of the equipment concerned. When the TPC receives confirmation that switching operations have been correctly carried out, he shall inform by telephone message with exchange of PNs, the authorised person stating clearly that the electrical equipment has been made dead. The information shall constitute a 'permit-to-work'. 'Permit-to-work' shall be issued in this manner only to authorised persons not lower in grade than a Linesman.

5.2. On receipt of 'permit-to-work' and before work is commenced; the electrical equipment specified shall be earthed as per rules in force. Each working party shall be protected by independent earths.

5.3. On completion of the work, the person who received the 'permit-to-work' shall ensure that all men and materials have been withdrawn from the electrical equipment and its vicinity. He shall then remove the earths and inform the TPC either by written memo or by a phone message supported by a PN that the work for which the permit-to-work was issued has been completed, men and materials have been withdrawn from the specified electrical equipment and the same maybe made live. Such procedure shall constitute cancellation of the 'permit-to-work'.

6. For work by other than authorised persons-

6.1. If work is to be carried out on or adjacent to any part of the electrical equipment by other than authorised persons, such work shall not commence until the 'person-in-work' card issued to him by an authorised person.

6.2. The 'Permit-to-work' shall be obtained from the TPC by an authorised person who shall earth the electrical equipment specified in charge of the work holding an acknowledgement on the other copy. A duplicate of every 'permit-to-work' card shall be retained in the personal possession of the authorised person who issued it.

6.3. On completion of the work and when all men and materials have been withdrawn from the electrical equipment and its vicinity, the person-in-charge of the working shall cancel his 'permit-to-work' card and return it to the authorised person who issued it. The authorised person shall in turn cancel the 'permit-to-work' as detailed in S.R.17.04.5.3. above.

7. If telephone communication with the TPC is interrupted, when a 'permit-to-work' is to be cancelled, the authorised person to whom the 'permit-to-work' was issued shall arrange locally to restore normal (live) conditions, the positions of electrical traction or overhead equipment specified in the 'permit-to-work' and to cancel the 'power block' if possible.

8. Whenever work has to be carried out by more than one working party, the 'permit-to-work' shall be issued by the TPC only to one authorised person who alone shall be responsible under this rule, for all work on the portion of electrical equipment, specified in the 'permit-to-work'. Any additional party or parties may work on the same portion of electrical equipment only with the permission of this authorised person who shall inform all parties of the total number of parties working on the same portion of electrical equipment. The authorised person shall cancel the 'permit-to-work' only when he is satisfied that all working parties have withdrawn all men and materials and removed the earths from the electrical equipment. In the event of telephone communication being interrupted, the responsible person shall proceed as provided for in para 7 above.

9. The number of each 'permit-to-work' issued, shall be entered in the log book of TPC, together with the particulars and time when the equipment is made dead for the work and re-energise after completion of the work, as per information received from the authorised person concerned

10. In case of work to be done inside the electric Loco sheds, the application for 'permit-to-work' shall be made to the TFO/ATFO/Chargeman (RS) who shall arrange for the issue of the 'permit-to-work after getting the switch of the inspection bay or the feeders opened. No intimation to the TPC is necessary and the 'permit-to-work' returned for cancellation by the person-in-charge of the work to the TFO/ATFO/Chargeman (RS) before the switches are closed.

11.1. Local arrangements may be made with the Station Master, Cabin Assistant Station Master, Yard Master and others responsible for the movement of traffic, for power blocks in such sidings which do not affect the movement of trains on main running lines, loop lines, and reception and departure lines in yards. The TPC shall, however, be kept informed as to when the power block is taken and cancelled. The Station Master, Cabin Assistant Station Master, Yard Master and other persons shall also advise the SCOR of such blocks.

11.2. Local blocks shall be arranged on the forms prescribed for the purpose.

12.1. In order to prevent electric rolling stock from being admitted into a track or cross over of which the overhead equipment is made dead, or for which a 'permit-to-work' has been issued, the levers of signals and points in the signal cabins governing such movement of electric rolling stock shall be protected by means of 'power block collars'. If the points and signals are locally operated, the same should be locked and the keys be kept with the Station Master.

12.2. The SCOR on receipt of a power block message from the TPC shall repeat to all Station Masters concerned the said message indicating the time from which the block is to commence. Each Station Master shall record and acknowledge the message with a PN and the time of receipt and then block the electric traffic on the line or lines described from the time indicated and place 'Power block collars' on the appropriate levers. When lever frames or other equipment in signal cabin are controlled electrically from Station Master's office, the Station Master shall place the 'Power block collars/pins' on the slides of electric slide instruments or on the keys of electric transmitters or interlocked key boxes. The Station Master shall also ensure that 'power block collars' are placed by Cabinmen/Levermen concerned on the relevant levers.

12.3. The 'Power block collars' shall not be removed until the Station Master receives message from the SCOR and acknowledges the message supported by a PN cancelling the power block. The SCOR shall not issue such a message unless he has received a written message or phone message supported by a PN from the TPC cancelling the 'Power block'.

NOTE: In all cases mentioned under paras 3, 4, 11 and 12 the Station Master must record the information in the Station Master's diary.

13. When Electric locos are placed in sidings for washing, cleaning etc., the section switch for that particular siding shall be opened by the person-in-charge of washing and the keys retained by him.

14. In the event of any accidents occurring in which electric rolling stock is involved or where damage to overhead structures or equipment takes place, the Railway servant who notices it shall take necessary precautions against danger of electric shock and shall inform the nearest Station Master, SCOR and TPC to take immediate action to cut off power supply, if necessary and restore the equipment as early as possible. The line shall not be re-opened for traffic and the responsible official of electrical department inspects the site and certifies that the line is safe for the passage of trains.

15. The only authorised person to issue permit to work is the TPC who will sign the prescribed form for DEE/Tr.D. The 'authorised person' may issue the certificate that the line is safe for passage of trains as required in Para 7.

16. Responsibility for staff and equipment when at work shall always be under the charge of the senior member who shall be responsible for all work being carried out correctly in accordance with the rules prescribed and such other instructions as are specifically issued by the Railway administration. In the case of illiterate staff working on or near electrical equipment, the circumstances of the work as affecting their safety and the safety of the electrical equipment shall be explained to them by the senior members.

16.1. When repair or adjustment to overhead equipment makes it necessary for a train to proceed cautiously, an authorised person shall be present at the site of work and shall be responsible for showing the signals prescribed in rule 15.09 and subsidiary rules thereunder.

16.2. Before commencing work on overhead equipment or in cases of breakdown of overhead equipment, when it is necessary for a train to proceed cautiously, the TFO/OHE, responsible for such notification shall arrange for issue of caution orders (See S.R. 17.03.2.3).

16.3. No alteration or addition shall be made to any equipment which may infringe the standard dimensions, whether permanently or temporarily. If an infringement is unavoidable, sanction shall first be obtained from the DEE/Tr.D.

16.4. Care shall be taken to ensure that covers of tank wagons, funnel of steam cranes or such other items are not left in such a position as to foul the traction overhead equipment.

16.5.1. No steam or hand-crane shall be worked adjacent to such traction overhead equipment which is not dead and earthed. All movements of the crane jib shall be carefully controlled to avoid fouling the traction equipment. Wherever possible, the direct blast form the crane funnel to the overhead equipment and particularly to section insulators shall be avoided.

16.5.2. Except in an emergency, to work a crane adjacent to overhead equipment, 24 hours notice shall be given to the DEE/Tr.D in order to make arrangement for overhead equipment staff to standby. When possible the working of cranes shall be included in the weekly programme detailed in SR. In an emergency, the TPC shall be advised and he shall make arrangements for overhead equipment staff to standby.

16.5.3. Cranes shall not be worked adjacent to traction overhead equipment unless the overhead equipment staff is present.

16.6. Before any work is commenced on Electric locomotives standing in the Loco shed, stabling depots or on a station platform line, the staff shall take all precautionary measures to ensure safety. Delay or inconvenience to traffic should not interfere with the man taking reasonable precautions to protect him.

16.7. Each man should provide for his own protection independent of every other man, except where one man is assisting another, in which case, the person in-charge of the work is responsible for the proper protection of himself and his assistants.

16.8. For the protection of staff employed upon electric locos at loco sheds/stabling depots or on platform, warning boards shall be placed in a conspicuous position at the ends of the electric locos by the staff concerned before proceeding to carry out any work in or under the electric locos. These boards, painted with the legend ‘not to be moved’ in white on a red background, should on no account be removed, except by the staff, who placed them in position.

16.9. Every possible precaution shall be taken to protect the staff while at work, and as an extra precaution Loco Pilots are prohibited from entering any driving compartment while the ‘Warning boards’ are in position.

16.10. Warning boards shall on no account be removed and power supplied until all precautions have been taken to ensure that all men are clear of danger.

16.11. The whole of the overhead contact system comprising of contact wire, catenary, droppers, register arms and pull-off wires shall always be considered live and men working over the electrified area shall take care to see that nothing comes in contact since danger of death results from coming in contact, directly or indirectly, with the overhead equipment.

17. Work on Electrical equipment:

17.1. Before commencing and for the whole time work is being performed on any part of the electrical equipment or adjacent thereto, that part of the electrical equipment shall be made dead and earthed save and except as in clauses 17.2. and 17.3 hereunder. Every working party shall be protected by independent earths. When it is necessary, minimum of two earths shall be employed, to the overhead equipment or transmission lines one on each side of the working party.

17.2. Except in the case of indoor high voltage electrical equipment, authorised staff may work on electrical equipment which is live or dead and not earthed subject to adequate precautions taken for the safety of such staff, the authorisation and precautions shall be prescribed by the Railway administration.

17.3. Work may be performed by authorised staff on indoor high voltage electric equipment which is not earthed but which is isolated from the main supply of electrical energy in such a manner that is safe to work on. The Railway administration shall prescribe adequate precautions to cover these conditions.

17.3.1. No work on live or any unearthed indoor or outdoor equipment above 400 volts is permitted. The only occasion when maintenance staff may work on unearthed equipment, after it has been isolated, is for the purpose of taking insulation tests. On completion of tests the equipment shall be earthed, before any work is started.

17.3.2. After the feeder is made dead, it shall first be discharged by throwing an earthed chain over the conductors. The feeder line is then connected to earth by means of stranded copper cable of adequate size securely connected to earth and the conductor.

17.3.3. Interruptors or isolator switches which have been opened for the purpose of isolating electrical equipment for maintenance shall have a danger notice displayed in a prominent position on the interruptor or operating handle of the switch or on the enclosure containing isolator switch and control apparatus as well as on the corresponding switches in remote control centre.

17.3.4. Before any work is undertaken on a section of overhead equipment which is normally live or any part of the structure adjacent there to or supporting such equipment situated at a distance of less than 2 meters from the live parts, the overhead equipment shall be made dead and earthed. A minimum of two earths shall be provided one on either side of the working party. In case, the work is spread over several sub-sectors, additional earth shall be provided close to the feeding points of supply control posts involved.

17.3.5. No work shall be attempted on insulted overlap spans or on section insulators unless the adjoining sections of overhead equipment on either side are made dead and earthed. In the case of a sectioning post, the isolator switch, the bridging or section interruptor, bridging overlap span shall be closed.

18. Works on roofs of rolling stock—

No person shall climb on to the top of engines or on to the roof of carriages or wagons when those vehicles are located beneath the overhead equipment except when the overhead equipment is dead and earthed.

18.1. Work on pantographs and roof of rolling stock shall normally be carried out on special sidings where switches are provided for making such sidings dead and earthed.

18.2. Traction Engine Examiner or other authorised person in-charge shall be responsible for making dead the over-head equipment over the track of inspection lines in loco sheds and stabling sidings before permitting the work to be done on the roof of electric rolling stock. The overhead equipment over these tracks shall not be energised except by the authorised person in-charge, who shall be responsible for every precaution being taken to ensure that every thing is in order and all staff are cleared off the roofs and live parts, before energizing the equipment.

18.3..1. At stations and yards, an authorised person shall arrange to make dead and earth the overhead equipment and a ‘permit-to-work’ card shall be obtained by the staff concerned before the work on the roofs of rolling stock or engines is commenced. On completion of work, the card shall be returned to the authorised person for cancellation. The authorised person shall then satisfy himself that everything is in order and that all staff are cleared off the roofs and live parts before energising the equipment.

18.3.2. Prescribed working rules for isolating and making dead the sections of overhead equipment for watering carriages, shall be followed at watering stations.

18.4. The SWR issued to each station, loco shed etc., shall specify the switches the operation of which will make a section dead or live.

19. Register of Message:-

All messages relating to operation of switches, issue of ‘permit-to-work’ and other important communications shall be recorded in a register by both the sender and the receiver together with the time when sent and the time when received.

19.1 All messages relating to operation of switches and issue ‘permit-to-work’ shall be confirmed by PNs.

19.2 All messages together with the PNs issued and received shall be recorded in the books specially maintained for the purpose.

20. Emergency telephone circuit.

20.1. Functions-

This circuit is provided to facilitate the train crew/ traction maintenance gangs to get in touch with the TPC with the least possible delay, specially during emergencies/accidents since due to replacement of aerial lines by underground cables, it will no longer be possible to hook a portable telephone on to the control line. This circuit will be operated by the TPC and is located in the remote control office.

20.2. Location-

Emergency socket boxes are provided along the track at an interval of 900 metres generally. Portable emergency telephones are given to maintenance gangs and train crew. These telephones can be plugged into the emergency socket boxes to enable the man on the spot to communicate with the TPC. Sockets for emergency telephones are also provided near the OHE isolating switches, sub-sectioning and sectioning posts, grid stations and feeding posts.

17.05 Warning to staff and public––

(1) All electrical equipment shall be regarded as being live at all times and consequently dangerous to human life, save and except in cases, where the electrical equipment has been specially made dead in accordance with special instructions. Caution notices shall be prominently fixed near all vulnerable places to warn staff and public to exercise due caution.

(2) No person shall climb on the top of engines or tenders or on the roofs of carriages or wagons when those vehicles are located beneath overhead equipment except when the overhead equipment is dead and earthed in accordance with special instructions.

SR. 17.05.1. All Railway servants other than those deputed to work on or near electrical equipment shall keep away there from.

2. Electric shock.

2.1. Instructions in English and the local language, the vernacular of the district, regarding the treatment of persons suffering from electric shock shall be exhibited in all inspection sheds, stabling depots, repair shops, stations and trains, and all staff concerned shall make themselves familiar with such instructions.

2.2. The instructions regarding the treatment of persons suffering from electric shock shall be exhibited at all supply control posts, overhead equipment maintenance depots, tower wagon sheds, loco sheds and signalling cabins.

2.3. In the event of electric shocks, the treatment laid down for respiration shall be carried out immediately.

2.4. The names and telephone numbers of the nearest Railway and civil doctors and hospitals shall also be exhibited at all the places stated in para 2.1.

3. Fire –

In the event of fire on or adjacent to any electrical equipment, the affected part shall immediately be completely isolated from its source of supply of electrical energy. To extinguish the fire, the extinguishing arrangements made by the Railway Administration for this purpose shall be used. Adequate extinguishing arrangements shall be made by the Railway Administration.

In the event of fire on or adjacent to electrical equipment being noticed by a Railway servant who is not an authorized person, he shall take action in accordance with G.R.6.10.

3.2.1. In the event of a fire of any part of any traction electrical equipment, the affected part at first be completely isolated from distribution system, if this has not been done

automatically. If arching continues due to feed from adjacent supply control posts, it shall be got interrupted either by remote or local operation of switches. The fire shall be extinguished by means of fire extinguisher provided. The TPC shall be informed immediately of the nature of the fire and the extent to which it has affected supply.

3.2.2. If any un-authorized person notices a fire on or adjacent to traction electrical equipment, he shall make no attempt to extinguish the fire but shall report the occurrence to the TPC by means of emergency telephone or to the nearest Station Master immediately. In the event of a Gangmate noticing fire on or adjacent to traction electrical equipment, he shall in addition, inform any passing train or trolley. If there be more than one Gangmate the occurrence shall be reported to the Station Master on either side. The Station Master on receipt of such information shall immediately inform the TPC. The TPC shall arrange for fire extinguisher in accordance with these rules. If necessary the Station Master should prevent the movement of trains towards the affected section.

3.3.1. In the event of fire on an electric engine, the Loco Pilot shall immediately switch off the circuit breaker and lower the pantograph. The train shall then be brought to a stop at once.

3.3.2. After cutting off electric supply to the affected circuits, the Loco Pilot shall take necessary action to put out the fire.

3.3.3. If fire cannot be extinguished by the above means, the Loco Pilot shall advise the TPC through the emergency telephone to arrange for the affected section of the overhead equipment to be made dead.

3.3.4. The Guard shall give all possible assistance to the Loco Pilot in putting out the fire.

3.3.5. Fire extinguishers of an approved type for use on electrical fires shall be provided on each electric engine and the Loco Pilot shall make himself familiar with the location and use of these extinguishers. During periodical inspection of a locomotive, the extinguisher shall be examined by the locomotive inspection staff.

3.4. Ordinary fire extinguishers or water from a hosepipe or bucket shall on no account be used to extinguish fires on live electrical equipment. If the services of the fire brigade are required, the brigade shall not be allowed to commence operations until all electrical equipment in the vicinity of the fire has been made dead.

3.5. Fire extinguishers, which have been used, shall be replaced or recharged with the least delay.

3.6. Sand-bins are provided at supply control posts, stations and signal cabins. The supervisory official-in-charge shall ensure that the sand is kept dry and clear of rubbish and is not used for any other purpose.

4. Precaution to be taken by staff.

4.1.1. Measuring tapes of all kinds, tools and metal articles, (such as paint pots, oil cans, metal bars) shall not be used where they can be lifted or be dropped or be carried by the wind on to overhead equipment when such overhead equipment is live.

4.1.2. Where overhead equipment for two or more tracks is supported on one structure and work has to be done on the overhead equipment of one track while the overhead equipment of adjacent tracks are live, access to the overhead equipment to be worked shall be by ladders, trestles or similar means but not by the supporting structures. Staff shall not, in any circumstances, walk or climb across live overhead equipment by means of the supporting bridge to gain access to the overhead equipment to be worked on.

4.2.1 Railway staff when required to carry out working on service, buildings and structures in proximity to overhead equipments shall exercise special care to ensure that tools, measuring tapes, materials etc., are not placed in a position where they are likely to fall, or make contact with electrical equipments.

4.2.2. Wherever such work has to be carried out under conditions which involve risk to the workmen or other persons, arrangements shall be made for authorised overhead

equipment staff not below the rank of ATFO to be present, who shall take such precautions as may be necessary for the safety of the persons concerned.

4.3.1. A working party shall not commence or carryout any work on or adjacent to overhead equipment involving danger to trains or traffic without the consent of the DEE/Tr.D, or the AEE/Tr. D.

4.3.2. No person shall disturb the overhead equipment or carryout bonding or other work in such a way as to obstruct the line necessitating the showing of danger signals.

4.3.2.1. Until such signals have been shown and.

4.3.2.2. If within the station limits, until he has also obtained the written permission of the Station Master and all necessary signals have been placed in the ON position.

4.3.3. When such work is to be undertaken, the traction official responsible for the work shall advise the Station Master/Station Masters concerned and arrange for showing the necessary danger signals.

4.3.4. When defects are noticed on overhead equipment which are likely to cause damage to pantograph or emergency repairs are being effected to overhead equipment and it is not possible to convey the information to the Station Master/Station Masters concerned to enable them to issue caution orders, the line or lines shall be protected in accordance with rule 15.09 and SRs thereto.

4.4.1. Every member of the staff shall provide for his own protection independent of every other member, except when one is assisting the other in which case, the person in-charge of the work is responsible for the proper protection of himself and his assistants.

4.4.2. Delay or inconvenience to traffic shall not be accepted as an excuse for a man not taking reasonable precautions to protect himself.

4.5.1. No person other than overhead equipment staff climb or work on any permit-to-work card, work shall not be carried out nor shall anything be affixed to any structure without the written permission of the DEE/Tr.D. (See SR.17.04.1.).

4.5.2. Before the work is commenced on a structure supporting overhead equipment, the limits of the danger zone/zones shall be defined by means of a red disc by day and red lamp by night which shall be placed in a suitable position.

4.5.3. When work is to be carried out in the danger zone of structure after the overhead equipment is made dead, no staff other than the person authorised to test and earth the overhead equipment shall attempt to climb the structure, until he has personally received definite instructions to climb the structure from the persons incharge of the working party and no message or signal other than these instructions is permissible.

4.5.4. The instructions may be conveyed from the person in charge of the party to workmen by another person, and such a person shall be individually deputed as a messenger by the person in-charge of the party and shall be of a rank not inferior to linesman.

4.5.5. All persons deputed in para 4.5.4. to convey instructions to workmen shall be made known to the workmen in advance and the workmen shall be advised that orders regarding the climbing of structures shall on no account be accepted from any person other than those deputed.

4.5.6. The person incharge or the person deputed under para 4.5.4 shall, before instructing his men to climb a structure, explain which section of overhead equipment is dead and which section is live and which parts of the structures are safe to work upon. The person in-charge or the person deputed under para 4.5.4 shall satisfy himself that his explanation is clearly understood by all the workmen whom he has instructed to climb the structure.

4.5.7. It shall be the responsibility of every person conveying instructions to climb structures to see that the danger disc or lamps are correctly fixed before the work is commenced.

4.5.8. On the structures spanning multiple tracks, where work is being carried out adjacent to one or more sections of overhead equipment the person incharge shall ensure, before any of the line or lines are made live on completion of work that all men and materials adjacent to the line or lines have been withdrawn from the danger zone, and if work is to continue on other parts of the structures, the danger discs or lamps have been shifted to indicate the changed danger zone.

4.5.9. The special attention of persons in charge of painting of structures is directed to this rule.

4.6. Instructions given in SR 17.05.5 shall be observed whenever excavation is carried out in the electrified area.

4.7. Notice shall be given to the electrical department before changing worn out rails to enable copper bonds to be removed and the rail joints properly rebounded after the completion of the work. Whenever any work is carried out on the permanent way, the track bonding Chargeman-in-charge shall personally inspect the track to assure himself that the continuity of the rail-return is maintained in good order.

4.8. Before any repair or alteration to the overhead equipment is commenced, the Chargeman shall arrange for power to be cut off from the equipment concerned after consulting the TPC. He shall then make sure that the line is dead by testing, following the procedure prescribed by competent authority.

4.9. The Chargeman shall then fix two earthing connections between the line and the structure one on each side of the section of the line where the actual work is being carried out and shall not remove it until the work on the line is completed and all workmen are clear of danger.

4.10.Only after a permit-to-work has been received and overhead equipment has been correctly earthed portions of track structure for a distance of less than 2 metres from any live equipment may be scrapped, cleaned or painted. Other portions of the structures of overhead equipment may be cleaned and painted while the overhead lines are live, unless special conditions at site render it unsafe or inadvisable, in which case the work shall only be done after making the equipment dead and earthed.

5.1.When excavations are being made adjacent to tracks and cable routes in an electrified area, adequate precautions shall be taken for the safety of the staff and to avoid damage to underground cables and rail bonds.

5.2.Markers are placed wherever possible, along the cable alignment and diagrams are available indicating generally the position of buried cables. Excavation shall not be undertaken in the vicinity of cable routes until the exact position of the cables has been ascertained and representative of the department concerned is present. This is applicable to cables of P&T department also.

5.3.If circumstances make it imperative that the work has to be undertaken without sufficient notice, the AEE/Tr. D and ASTE concerned shall be informed by a message for arranging staff to be present.

5.4. No staff shall be allowed to work on any portion of a signal post or its fittings falling within a distance of 2 metres from 25 KV live conductor or a metal part electrically connected to this conductor unless such portion is protected with an iron screen .

If due to any reason, the protective iron screening is not provided, the Railway staff shall not undertake any work on those portions of the signal or its fittings falling within 2 metre zone from a 25 KV live part unless the power has been switched off and a permit to work has been obtained. To draw the attention of the signal staff in such cases, a caution board 9” X 8” indicating “Caution” in Hindi, English and the regional language in white letters with red background shall be provided on the signal post at a height of 10 ft. above the rail level.

The Inspectors of the Signal Department and Station Masters shall explain these instructions to the staff working under them and ensure that they are correctly understood.

5.5.Induced voltages may appear in signalling and Telecom Circuits, where the parallelism in lengths of track is important. It may be noted that even when there is no induced voltage in circuit at the time of starting the work, precautionary measures listed below shall be taken, as induced voltage may appear at any time on account of sudden short circuit in the traction overhead equipment. It is also to be noted that in some circuits with earth connection, contact with which may normally be without danger, in case of break of the circuit an induced voltage may appear between two parts created by the break. Consequently each time staff have to work on S &T circuits along with 25 KVAC electrified line, they must take the following precautionary measures.

5.5.1.They should as a general rule wear rubber gloves and use tools with insulated handles.

5.5.2.When the work to be done is meticulous and rubber gloves cannot be used, special precautions should be taken by splitting the circuit into the section or earthing them. In special cases both steps should be taken simultaneously.

5.6.1. All overhead line staff, when on patrol, shall watch the pantographs of passing electric rolling stock and if any defects are noticed, they shall report to the TPC through the emergency telephone circuit or any other telephone, if emergency telephone circuit is not available, giving full particulars including the number of the electric rolling stock, the location of the defect and the time when defect was noticed.

5.6.2. The TPC shall communicate reports on a defective pantograph to the TLC who shall arrange to have the electric rolling stock stopped as soon as possible, for examination of the defective pantograph.

5.7.TFO/OHE shall be responsible for the proper and efficient maintenance of all breakdown equipment, wiring trains, tower wagons, breakdown lorries, etc., so that they are always in a state of good repair. He shall ensure that they are equipped with full quantities of stores and spare parts as per approved inventory. All tools, tackles, straining, screw clamps, ropes and ladders shall be maintained in good condition and ready for use at all times.

5.8. The staff concerned shall enter that the equipment not in immediate use is always ready for service, except such equipments as may be under repair or overhaul.

17.06 Alterations to Track–

Before any alteration to alignment or level of electrified tracks is commenced, due notice shall be given to those responsible for the overhead equipment so that the overhead equipment may be adjusted to conform to the new conditions.

SR. 17.06.1.1. Before any slewing alteration to super-elevation or level of tracks from the permissible parameters is done, notice shall be given to the DEE/Tr.D to enable him to arrange for adjustment of over head equipment to conform to the new conditions if necessary. Such work shall be included in the weekly programme detailed in SR.17.04.8.

1.2. It shall be ensued that the level of rail under foot-over bridges, road-over bridges, tunnels and other over line structures does not exceed the level marked under such structures.

1.1. All minor alterations to overhead equipment whether permanent or otherwise shall be reported to the TPC immediately by telephone and to the DEE/Tr.D or the AEE/Tr.D in writing.

1.2. Major alterations affecting the existing disposition of any section of overhead equipment shall not be made unless sanctioned by the DEE/Tr.D.

3.1. When working on overhead equipment, all staff shall ensure that the wires are not deflected, which may foul pantographs of electric rolling stock passing on other lines by steady arm tubes of any other part of the overhead equipment.

3.2. When the overhead equipment is slewed either temporarily or permanently, the persons in-charge shall ensure that section insulators, jumpers and other fittings do not foul the pantographs of electric rolling stock passing on the other lines or any other parts of the overhead equipment.

4.1. Whenever any work on track, which is likely to affect rail bonds, 'track circuit bond' is undertaken by permanent way staff, adequate notice shall be given to the TFO/OHE and Signal Inspector where track circuits are involved to enable him to arrange bonding staff for removal and replacement of bonds.

4.2. Bonding staff when working with a PWI shall work under his instructions and PWI shall be responsible for the safety of the track and the staff working under him.

17.07 Tripping of circuit breakers of locomotives and electrical multiple units at neutral sections––

Unless otherwise allowed by special instructions, the Loco Pilot of the locomotive or electrical multiple unit shall coast through the neutral section, duly switching off power. Necessary indication boards to this effect shall be provided to guide the Loco Pilot to switch off and switch on power.

S.R. 17.07.1. Warning Boards for neutral sections.

Warning Boards as per figures 1 & 2 shown in the end of this SR, shall be fixed on the OHE masts in rear of neutral sections at a distance of 500 metres and 250 metres respectively. Similarly the location at which the power has to be switched 'off' and 'on' shall be indicated by boards to be fixed on the OHE masts as per figures 3 & 4 respectivesly. No Loco Pilot shall pass the neutral section between the warning boards with power 'on'. In order to negotiate the neutral section without stalling, the Loco Pilot shall approach it, at a speed not less than 30 Kmph. The Loco Pilot or the Assistant Loco Pilot as the case may be shall call out to each other, all the permanent/temporary display boards in the section, in the same manner as they call out the aspects of fixed signals and engineering indicators.

2. Warning Boards for Temporary Neutral Sections.

Due to exigency of imposition of speed restrictions of less than 30 Kmph, within one Kilometre on either side of the neutral section, emergency feeding arrangement in case of sub-station failures etc., it may be necessary to provide a temporary neutral section, where the Loco Pilots would have to lower and raise pantographs during its negotiation. Warning Boards as per figures 1 & 2 shall be fixed on the OHE masts at a distance of 500 metres and 250 metres respectively, in rear of the temporary neutral section. Similarly, the location at which the pantographs would have to be lowered and raised shall be indicated by boards as per the figures 5 & 6. Such warning boards shall be provided only if temporary neutral section working is to be continued for a duration of more than 24 hours. All Loco Pilots shall be given Caution Order at station/notice station concerned duly indicating the locations at which the pantograph has to be lowered and raised. Loco Pilots of all trains shall approach the temporary neutral section at a speed of not less than 30 Kmph to negotiate it without stalling.

3. Programmed speed restrictions at Neutral Sections.

Whenever speed restrictions of less than 30 Kmph on either side of the neutral section (for programmed works) is necessary, such speed restrictions shall not be imposed until the Sr.DEN/DEN concerned has made arrangements with the Sr.DEE/DEE(Tr.D) for temporary energisation of the neutral section. After the neutral section is provided with necessary warning boards, the Tr.D staff shall authorise the Station Master/SCOR to permit movement of electric train/EMU into the section, duly exchanging PNs and also after informing TPC that the neutral section has been jumpered and temporary section provided, duly specifying the location. No electric train/EMU shall be permitted to enter

the section with speed restriction of less than 30 Kmph. Unless the Station Master/SCOR has received this authorisation from Tr.D staff, under such conditions, the Loco Pilots of all electric trains/EMUs shall be issued with Caution Orders at stations/notice stations concerned, permitting them to pass the neutral section with power ` ON ` and also indicating to them the location of temporary neutral section, where the pantographs have to be lowered and raised.

4. Emergency speed restriction at neutral sections.

Whenever emergency speed restrictions of less than 30 Kmph are required to be enforced within one KM on either side of the neutral section, the Permanent Way Staff shall immediately arrange to protect the affected section on either side and take all steps to bring to halt any train in rear of neutral section. The PWI shall also inform the nearest Station Master regarding imposition of speed restriction. The Station Master shall inform the Station Master at the other end of the neutral section, the SCOR and TPC. The SCOR and Station Masters at either end of the neutral section shall not permit the entry of any electric train/EMU into the section until an advice has been received from the TPC. The TPC shall make immediate arrangements for energising the neutral section and provision of a temporary neutral section. After this has been completed, movement of electric trains/EMUs shall be permitted in accordance with S. R. 17.07.3. The Tr.D. official, who has jumpered the neutral section, shall issue a Caution Order to the Loco Pilot of the train, if any which might have been stopped in rear of the neutral section, advising him that he can pass the neutral section, with power 'on' and also informing him, if necessary, the locations at which he has, to lower and raise pantograph at the temporary neutral section.

17.08 Tower wagon—

The rules for the movement and working of tower wagons shall be laid down by special instructions.

S.R. 17.08.1.1. In case of breakdown of overhead equipment, the SCOR, on request from the TPC, shall arrange for quick passage of the tower wagons /OHE wiring trains to the site of breakdown. The movement of tower wagons shall be governed by all the rules governing movement of trains.

1.2. Tower wagons shall not be worked on running lines unless a Driver or an official holding a competency certificate for this purpose is on the tower wagon and is incharge of its movements. The certificate of competency shall be issued by DEE/Tr.D after a written, oral and practical test in the relevant rules.

1.3.1. Ladder trollies shall be considered as lorries and when placed on the line shall always be accompanied by atleast 4 selected men who can easily lift them off the track.

1.3.2. These trollies shall not be used for the carriage of electrical or other heavy materials. The running of ladder trollies shall be governed by Rules 15.18 to 15.27 and SRs thereunder.

1.3.3 These ladder trollies along with ladders will move on the track under protection as laid down in Rule 15.09 and SRs thereunder both outside and witinstation limits.

1.3.4. The working of ladder trollies will be supervised by a supervisor not below the rank of Electrical Chargeman specially authorised for the purpose. It shall be the responsibility of the supervisor concerned to ensure that caution orders and various other advices required as laid down in Rule 15.09 and SRs thereto, are issued to all the station staff concerned well in time. The supervisor will also ensure that these ladder trollies and ladders are removed from the track in time to avoid detention to trains. After the trollies are removed, they should also ensure that they are properly secured without any infringement of moving dimensions, before allowing a train to pass.

1.3.5. While issuing caution orders and advices, specific mention shall be made regarding the type of precautions, the exact kilometreage between which the work is in operation and the block section concerned, so that the Loco Pilots may keep a sharp lookout and be prepared to stop short of obstruction, if required.

1.3.6. At places where the trollies are lifted off the track and kept in trolly refuges, special care shall be taken to ensure that these trollies do not endanger safety of moving trains.

1.4. In the event of a minor defect occurring on the overhead wires which does not necessitate the immediate isolation of the section, Station Masters should stop all trains outside the affected section and issue a “caution order” to the Loco Pilot to proceed cautiously until he is clear of the section or until it is safe for him to proceed at normal speed. Such occurrences should be immediately reported to the TPC who will arrange to inform the maintenance party and to proceed with the repairs as soon as possible.

1.5.1. Supervisory officials in-charge of maintenance of overhead equipment shall carefully plan their work in such a way that under normal circumstances, train service is not affected in any way, where the nature of the maintenance work is such that train movement is likely to be affected, the TFO/OHE shall give prior intimation to the DEE/Tr.D who will arrange for traffic working rules to be issued to facilitate the execution of the work.

1.5.2. Whenever any section of the overhead equipment is to be made dead for the purpose of maintenance work, the Chargeman in-charge of the section will give intimation to the TPC at the earliest possible time, specifying the section where shut-down is required. The TPC shall then intimate the Chargeman the time and permissible duration of the shut-down. The Chargeman is responsible for regulation of work so that permissible duration is not exceeded. If for any reason the period of shut-down is required to be extended, the TPC should be advised in good time.

1.5.3. Where written messages are not exchanged, shut-down will be effected by exchanging messages over the telephone, using the PN. The official in actual charge of the maintenance work shall in person exchange messages with TPC. No one below the rank of linesman is authorised to exchange such messages.

1.5.4. Shut-down on any section of overhead equipment (except at location where Electric locos are stabled for examination), shall be effected only after the SCOR has been informed by the TPC and has agreed to shutdown except in case of emergency. When train movement has to be blocked over any crossover road or section of line for the purpose of effecting shut-down, the TPC shall advise the CHC, as to what train movements are to be blocked during the period of shut-down. The CHC shall advise the Station Masters of train movements as required. The Station Master shall block train movements as required and advise CHC by message. The CHC shall advise the TPC by message that the movements have been blocked.

1.5.5. After the train movements are blocked as required and after switching of power from the section, the TPC shall inform the Chargeman and other official in charge of the work by message that power has been switched off and work may be commenced. On completion of the work, the official-in-charge of the work shall advice the TPC by message that the work has been completed. The TPC shall then restore power on the section and inform the CHC by message that normal traffic may be resumed.

1.5.6. Operation of the overhead switch isolators at stations for the purpose of effecting shut-down shall be done on instructions from TPC by authorised person available for the purpose.

1.5.7. Before commencing work on the overhead equipment, the Chargeman shall test lines for supply with the method prescribed by competent authority and fix two earthing connections on the line, one on either side of the section of line where work is to be carried out, the earthing connections shall be of approved type and of adequate cross-sectional area. The earthing shall not be removed until all work has been completed and all men are clear of the line.

1.5.8. In case of break down of overhead equipment, the official in-charge of the repair work shall inform TPC as to what sections of line are to be made dead to facilitate the work. Care shall be taken when effecting shutdown to ensure that power is not cut off over those sections in which train services may be maintained without hindrance to the repair work. The procedure for cutting off power and for blocking train movements and for restoration of power shall be the same as in the case of shut-down for maintenance work.

1.5.9. On completion of the repair work, the official in-charge of the repairs shall advise whether normal traffic may be resumed or whether any speed restrictions are to be imposed. If a speed restriction is to be imposed, the official concerned shall advice in writing to the Station Master and shall also inform the TPC. The TPC shall clearly state so in his advice to the CHC, who will ensure that these instructions are conveyed to the Station Master concerned. When the speed restriction is to be removed or relaxed, supervisory official shall advise in writing to the Station Master and also inform the TPC who shall then convey the message to CHC.

1.5.10.1. When loads which exceed the prescribed standard moving dimensions are to pass through the electrified sections, the CHC shall give atleast 48 hours prior notice to the TFO/OHE & the TPC.

1.5.10.2. When shut-down is to be effected on any section or sections of the line for the passage of oversized consignments, the same procedure as laid down in para 1.5.4 shall be followed. The authorised person receiving the shut-down message from the TPC shall issue Permit-to-work to the Guard of the train with the oversized consignment, for each section of the line on which power has been shut-down. The Guard shall not allow the train to enter this section until the Permit-to-work is received by him. Before issuing the Permit-to-work, the authorised person will test the line but it is not necessary to earth the line. When the train has to pass through two or more feeding sections, each section shall be tested before the train enters the section.

1.5.10.3. An additional authorised person should be deputed to travel on the engine, to test the line for power supply at each feeding section. The Station Master at the starting point shall advise the Loco Pilot in writing to follow the instructions of the authorised person, to stop the train as and when required for the purpose of testing the line for power supply.

1.5.10.4. The Permit-to-work shall be returned by the Guard of the train duly signed, to the authorised person, when the train has passed out of the section concerned. The authorised person shall then issue a message to the TPC that the line is clear.

1.5.10.5. No work may be carried out in the vicinity that is within 2 meters of live overhead equipment, till a Permit-to-work has been obtained as laid down in SR.17.04. Atleast 48 hours prior notice shall be given to the TFO/OHE, who shall depute an authorised person to arrange for the shut-down. The authorised person shall effect the shut-down by following the procedure laid down in Para 1.5. and shall issue a Permit to work to the supervisory official incharge of the work. Before issusing the Permit-to-work the authorised person shall test the line for supply and earth the lines. The Permit-to-work shall be retained by the supervisory official-in-charge of the work and on completion of the work, he shall return the permit-to-work duly certified that the work has been completed and all men are clear of the live equipment. The authorised person shall then remove the earthings and issue a message to the TPC that power may be restored on the line.

1.5.10.6.1. Crow nests or other stray wires, in the vicinity of live overhead equipments, may be removed only after power has been switched off from the line. Such work may only be done, with the aid of insulated hooks of approved type, taking care not to make contact with the over-head wires or insulators. Under these circumstances, it is not necessary to test and earth the lines, after it is certified by the TPC.

1.5.10.6.2. When a nest or stray wire is to be removed, a person not below the rank of a Lineman, shall inform the TPC over the telephone that power is required to be switched off, clearly stating the location where the work has to be done. The TPC shall then switch off power from the section, after instructing the SCOR to stop train movements which are likely to result in making the line live and ensuring that these instructions have been conveyed to the Station Masters concerned and have been acknowledged by them exchanging of PNs. The TPC shall then inform the Lineman that the power has been switched off from the line. The Lineman shall arrange to remove the crow nest or stray wire as expeditiously as possible and when this has been done, inform the TPC without delay that the work has been completed and power may be restored on the line.

1.5.10.6.3. The TPC shall make detailed entries in the log sheet of all particulars relating to the shutdown.

1.5.10.7. Due to a break of overhead equipment or for any other reason, when it becomes necessary to stop train movements urgently over a section of line or over a cross-over road, the TPC shall inform the SCOR.

2. Tower wagon Drivers.

A tower wagon Driver should undergo course of training and tests indicated below, before the certificate of competency is issued to him:-

2.1. A training in G&SR followed by a written and practical test conducted by the ZRTI/MLY.

2.2. A practical test by CTFO/OHE to see if the employee is fully conversant with the engine and running gear of the tower wagon, as well as the details of maintenance he is expected to carry out.

2.3. Training for a period of one month to learn the road in the section in which he is expected to work the Tower Wagon, at the end of which, the employee should sign a declaratlion that he is fully conversant with the road.

2.4. A period of practical training for 2 months in the actual driving of the tower wagon under the supervison of a qualified tower wagon Driver at the end of which a driving test will be taken by DEE/Tr.D.

2.5. Prescribed medical examination.

3. Competency Certificate:- Tower wagon Driver will be given a competency certificate by DEE/Tr.D after written test on form TR-4.

Form No.TR-4

CERTIFICATE OF COMPETENCY

South Central Railway
Electrical Department.

Number …….. (for tower wagon Drivers)
Shri …… is authorised to drive tower wagons in the section between …… and …… duly observing all the safety rules and standing instructions. His written declaration *dated …….. that he is fully familiar with the signals in the above section has been noted while issuing this certificate.

Date: DEE/Tr.D

This declaration must be countersigned by driving inspector and personally scrutinized by the officer, before issue of the certificate. The driving inspector before countersigning the declaration, shall orally examine the employee for his knowledge of the road.

4. Maintenance.

Tower wagons perform a key role in the maintenance of OHE and for attending the breakdowns. The satisfactory upkeep of tower wagons is, therefore, of utmost importance, It will be the direct responsibility of ATFO/OHE to ensure that the tower wagon under his control is maintained satisfactorily and is always available for attending to OHE and for use in the event of breakdowns.

Each tower wagon should carry necessary tools for maintenance of OHE and attending to breakdowns such as tackles, straining screws, clamps, ropes, a minimum of two ladders as well as adequate stock of insulators, contact and catenary wires and other OHE fittings. An approved list of tools and equipment to be carried in each tower wagon should be issued by DEE/Tr.D. It will be the responsibility of ATFO/OHE to ensure that tools and equipment as per the approved list are always available on the tower wagon.

A monthly mechanical inspection of the bogie and running gear of each tower wagon shall be done by a nominated TXR of the mechanical department, headquartered close to the OHE depot, where the tower wagon is normally stabled. For each tower wagon on a zonal railway, the TXR responsible for monthly mechanical inspection will be nominated and a joint circular to this effect must be issued by CME and CEE.

The ATFO/OHE incharge of the tower wagon will advise the TXR concerned the date on which the tower wagon is required to be attended for monthly inspection and running repairs. Such advice shall be given 48 hours in advance. It will be the responsibility of the ATFO/OHE to ensure that this monthly advice is issued regularly and the tower wagon is offered for inspection and attended to every month. The TXR will arrange for examination of bogie, running gear, under frame, under gear fittings and axle boxes only, in accordance with IRCA rules Part III. He will also arrange for stenciling the date of monthly examination on the sole bar of the tower wagon.

Depending on the intensity of usage of the tower wagon in each Railway, the CEE and CME should jointly decide the interval at which the tower wagons are required to be given POH. Such POH will be done in the nominated C&W workshop of the zonal Railway.

The day to day maintenance of the diesel engines and driving gear of the tower wagons will be the responsibility of the ATFO/OHE concerned. The tower wagon drivers should carryout the daily maintenance. Specialized staff conversant with the maintenance and overhaul of diesel engines and driving gear should be available on each division for attending to the monthly and six monthly maintenance of the diesel engines and driving gear. Depending on the work load, two or three divisions may be grouped together for the purpose of posting such specialized staff if it is convenient.

Taking into account the total number of tower wagons and the need to relieve tower wagons for the purpose of POH etc., in each Zonal Railway, one or more spare tower wagons may be provided as necessary.

5. Rules for operating Tower Wagon.

5.1. No tower wagon may be operated by anyone unless he is authorised to do so after he has been examined for his knowledge of the rules prescribed.

5.2. Scope:-

The following rules shall govern the working of a tower wagon fitted with a pantograph for the purpose of inspection of traction OHE either during commissioning of completed sections of traction OHE or during periodical inspections carried out by the traction maintenance staff. All staff incharge of operation of tower wagons shall make themselves fully conversant with and act according to the special instructions given below.

5.3. Movement:-

The movement of tower wagons on tracks will be governed by all rules governing movement of trains.

5.4.1. No tower wagon shall be driven except by an authorised person and no person shall be so authorised unless he has proper road and working knowledge of the section on which the tower wagon is operating. In addition to being conversant with the

operation of the tower wagon, he should also be in possession of valid competency certificate for the task.

5.4.2. The tower wagon shall be driven during contact wire level and stagger recording operations at a speed not exceeding 10 kmph. This shall be done by running on the first gear. Riding on the clutch for this purpose is prohibited.

5.4.3. If the tower wagon is driven for other than recording operations, the speed should not exceed the maximum permissible speed to which the vehicle is cleared to run (stenciled), subject to the restrictions, temporary or permanent, imposed on account of engineering, signalling or other considerations:

5.4.4. In each TRD maintenance depot, one or more OHE staff duly trained with valid competency certificate shall be kept as trainee reserve for driving a tower wagon in exigencies.

Note: High speed tower wagons: These are special type tower wagons with eight wheeled bogie under frame intended to run at higher speed duly observing all sectional speeds and other speed restrictions and the maximum permissible speed that it can run will be stenciled on them.

5.5 Pantograph operation :-

5.5.1. The pantograph mounted on the roof of the tower wagon is electrically bonded to the underfame by means of cable connections. The cable connections should be checked before start of each operation for checking and adjustment of OHE.

5.5.2. The pantograph shall normally be kept in the fully lowered position and clamped securely by means of the special clamp provided for the purpose. No string, chord, etc shall be used for the purpose.

5.5.3. Before any person goes up to the roof for the purpose of commencing inspection and adjustment, the section of the traction OHE concerned shall be made dead and earthed at both ends. Additional earths shall be provided where necessary. After earthing OHE as above an additional earth shall be provided near the tower wagon on the OHE of the track on which the tower wagon is standing. An authorised person not lower in rank than a Lineman shall then go up on the top of the tower wagon and remove the clamps so as to release the pantograph.

5.5.4. Under no circumstances should the tower wagon work with the pantograph raised without an earth on either side of it on the section of the OHE on which it is working.

5.5.5. In order to ensure that the pantograph does not enter a section with live OHE, the tower wagon shall be protected on both the sides with banner flags and other signal flags.

The Driver shall further stop the tower wagon ahead of all turnouts, crossovers, insulated overlaps and section insulators and cross them only after ensuring that the section ahead is dead and earthed. Banner flags shall only then be removed for the purpose of admitting the tower wagon into the section ahead.

5.5.6. At the end of the inspection and checking, the pantograph shall be lowered and clamped by an authorised person not lower in rank than a linesman working on the roof after earthing the OHE of the track on which the tower wagon is working. The earths on OHE near the tower wagon shall then be removed after all persons working on the roof have come down from the roof .

5.6. Tower wagon provided with revolving tower:

5.6.1.Revolving tower shall ordinarily be in the normal position. i.e., along the length of the tower wagon.

5.6.2.The revolving tower shall be moved out of the normal position, only when the tower wagon is stationary.

5.6.3.The tower wagon shall be moved only after the revolving tower has been put back to the normal position.

WORKING OF TRAINS ON ELECTRIFIED SECTIONS OF RAILWAYS

6. Annual maintenance and check by tower wagons:-

This schedule must be carried by tower wagon. During this schedule, fittings are not generally dismantled but all fittings which are found defective must be replaced. In addition, clearances, heights, stagger etc., should be checked and corrected.

The details of work to be carried out during this schedule are as under:–

6.1. Masts, portals and cantilever supports:–

6.1.1. Check rail level and setting distance against markings on the masts and entries in the registers, variation above 20 mm in setting distance and 20 mm in rail level should be notified to the PWI for correction. Variations, even within the above limits, should not be permitted, if the schedule of dimensions are infringed.

6.1.2. Check all steel parts and remove rust of painted steel works wherever found. Rusty portions after cleaning must be given two coats of zinc chromate and painted wherever required. Grease all turn-buckles and pulleys.

6.1.3. Check all anchors for tightness of bolts and provision of checknuts and pins wherever required. Grease all turn-buckles and pulleys.

6.1.4. Examine the foot of each structure to ensure that muffs permit drainage of water outwards. Clean the muffs of any muck or dirt that might have accumulated. Cracked or damaged muffs must be recast.

6.1.5. Check all bonds thoroughly. Defective bonds must be rectified and missing bonds replaced.

6.1.6. Inspect all galvanized pipes and fittings. Where galvanization is found to be chipped off, fitting or pipe may be replaced.

6.1.7. Inspect and tighten all G.I. bolts.

6.1.8 Examine register arm and steady arm hooks for possible cracks. Check for possible crack on steady arm tube itself.

6.1.9. Clean all insulators, carefully check for cracks and replace insulators which are cracked or chipped.

6.1.10. Lubricate Stay arm fittings i.e., compression tube bolts or turn buckle threads and ensure free movement.

6.1.11. Check and adjust heights and staggers on the basis of setting distance and rail level marked. Close co-ordination with PWIs is required for keeping the permanent way at correct location.

6.1.12. Check presence of prescribed sign boards such as caution notice boards, number plates, coasting boards etc. Paint the boards as required. Ensure that they are well secured.

6.1.13. Ensure that the drain holes in the tubes are free and not clogged.

6.2. Contact and catenary wires:–

6.2.1. Thoroughly examine conditions of contact and catenary wires, particularly for kinks and twists in contact wire and broken strands of catenary wire.

NOTE:–Any stranded conductor (catenary wire etc) should be suspended if more than 20 percent of the strands are found broken.

6.2.2. Check tightness of PG clamps and jumpers. If necessary, open them for thorough examination.

6.3. Droppers: Check droppers and tighten bolts wherever required.

6.4. Turns Outs:–

6.4.1. With tower wagon running on main line check up if the loop OHE passes smoothly on the pantograph.

6.4.2. With tower wagon running on loop line check up if the main line OHE passes smoothly under the pantograph.

6.4.3. Check up stagger at turnout of both the OHEs with respect to both loop and main lines. (It shall not normally exceed 300 mm)
6.4.4. Check up that the main line OHE of overlap type turnout is about 50mm below that of the turnout OHE.

6.4.5. Check up cross contact bar, if any for displacement and distortion.
6.4.6. Check for hit marks if any.
6.4.7. Check for hard spots near rigid droppers, if any,
6.5. **Section insulators**.
6.5.1. Clean insulators and replace badly chipped or even slightly cracked insulators.
6.5.2 Check up runners for flash marks.
6.5.3 Observe for hit marks on runners.
6.5.4 Check for excessive wear in contact wire near anchor clamps.
6.5.5 Check the level of the assembly and adjust if necessary.
6.5.5 Tighten PG clamps of droppers and stiffeners.
6.6 Isolators:
6.6.1 Check number plates. They should be clean and well secured.
6.6.2 Check correctness of operation: correct alignment of contacts and arcing horns.
6.6.3 Check earth continuity wherever applicable.
6.6.4 Lubricate moving parts and locks.
6.6.5 Check interlocks where provided.
6.6.6 Check that the distance between male and female contacts in open positions is 380 mm to 500 mm depending upon the type of isolators.
6.7 **Overlaps:**
6.7.1 Check up height and stagger of OHE in the overlap section.
6.7.2 Check up whether the normal minimum clearance of 500 mm is available between the two OHEs in an insulated overlap and 200 mm in the case of uninsulateds overlap.
6.7.3 Check up whether the lifting of out-of-run OHE is correct.
6.7.4 Check for parallel running of contact wires in the overlap for about 4 M in the panto sweep region.
6.8 **Contact wire thickness:**
Measure and record thickness of contact wire.
6.9 **Neutral Section:**
Carryout all checks as far as overlap in the case of overlap type neutral sections and as far as section insulators in the case of section insulator type neutral sections.
6.10 **Overline structures:**
6.10.1 Check and record horizontal and vertical clearances and adjust OHE as required.
6.10.2 Check for any flash marks underneath the bridge structures.
6.10.3 Check if minimum height of contact wire is available.
6.10.4 Check that the gradient of contact wire on either side does not exceed 3 mm.
6.10.5 Check up that smoke screens are well secured and have adequate clearance from OHE. If not, get these attended to by engineering department.
6.11. **Level crossings:**
6.11.1. Check up height of contact wire.
6.11.2. Check for any flash marks underneath the bridge structures.
6.11.3. Check if minimum height of contact wire is available.
6.11.4. Check that the gradient of contact wire on either side does not exceed 3 mm.
6.11.5. Check up that smoke screens are well secured and have adequate clearance from OHE. If not, get these attended to by Engineering department.
6.11.6. Check and adjust height and slope of contact wire.
Examine for water tightness and get necessary repairs done by engineering departments.
Check rail level marks on side of tunnels.
6.12. **Regulating equipment:**

6.12.1. Check 'X' and 'Y' in the case of pulley block type equipment and 'Z' and 'Y' in the case of winch type equipment against prescribed values of the temperature at the time of checking, making use of turn buckles, adjust as required.
6.12.2. Check that the compensating plate is vertical, if not adjust as required.

6.12.3. Lubricate pulleys and other moving parts.
6.12.4. Check if 20 mm vide bands in black colour are painted on the mast to indicate upper and lower movement of counter weight.
6.13. **Bands and earth connections:**
6.13.1. Check all bands and replace defective or missing bands and paint all bands.
6.13.2. Inspect earth and record each resistance. Earth having resistance of over 10 ohms, should be attended to.
6.14. **Masts:**
The verticality of all masts should be checked up with plump bob and remedial action taken as required.
6.15. Sites affected by accidents, should be specially checked and adjusted.
6.16. **Feeder lines:**
6.16.1. Inspect guard wires at road crossings.
6.16.2. Inspect earthing of towers.
6.16.3. Measure and record the earthing of towers.
6.16.4. Clean insulators.
7. **Equipment –**
The following equipment should be carried by the Driver of the tower wagon.
7.1. One copy of hand book for Loco Pilots & Guards.
7.2. One copy of working time table.
7.3. One portable field telephone.
7.4. One watch.
7.5. Three sets of H/S/ flags.
7.6. Two tricolour HS lamps.
7.7. One tail lamp.
7.8. Ten detonators.
7.9. One Powerful electric torch.
7.10. One chain with pad lock & Key.
7.11. One pair of spare spectacles.
7.12. Such other equipment and stores as may be prescribed by the electrical department.
7.13. General and Subsidiary Rules for 25KV A.C. Traction.
7.14. One fusee.
Speed of Tower wagons:
The tower wagon shall run at a speed stenciled subject to caution orders in force. If the rower wagon is driven for inspecting contact wire level and stagger recording operations, the speed should not exceed 10 kmph and this shall be done by running on the 1st gear. Riding on the clutches for this purpose is prohibited.
8. **Working of tower wagons.**
8.1. A tower wagon must always run under block protection and shall be treated and signalled as a train.
8.2. If there is total interruption of communications, the Station Master on duty, must advise the tower wagon Driver of the same and the tower wagon shall be worked on the section under the rules for working of trains during total interruption of communications.
8.3. When a Tower wagon has to stop in the block section for inspection work, line block has to be taken in advance.
8.3.1. The running and stabling of tower wagon shall be arranged by Station Master in consultation with the SCOR. In case the control is not working, the Station Master shall consult the Station Masters of the adjoining stations.

8.3.2. When the tower wagon is stabled on running line due to unavoidable circumstances, the mechanical hand brake shall be applied and the tower wagon shall be securely chained to the rails in accordance with Rule 5.23 and SRs thereunder.

8.3.3. The tower wagon shall not be moved into or outside the traffic yard without the permission of Station Master on duty. No shunting on goods or passenger stock must be permitted on the line, where the tower wagon is stabled. Shunting should not be performed with the tower wagon attached.

8.3.4. When the tower wagon is moved, attached to a train, it should be inside the rear Brake-van and the speed of the train to which the tower wagon is attached should be restricted to the speed of the tower wagon (which is stenciled on the tower wagon) observing all other speed restrictions. Necessary caution order shall be issued to the Loco Pilot of the train duly advising the Guard of the train and control.

8.4. No unauthorised person shall be allowed to operate the tower wagon.

8.5. Failure of the tower wagon and accidents thereto shall be treated in the same manner as train accidents and action taken as per rules in force.

Special responsibilities:

The Driver shall be responsible to see at the commencement of the journey that the tower wagon is fit in all respects to perform the intended journey that is, brake and horn are in efficient working order and the equipment like flags, detonators etc., mentioned in para 7 above are complete.

9. **Periodical examination-**

Tower wagon is to be inspected monthly by a nominated TXR as per 0519 (2) para of "Manual of AC Traction and Operation". The C&W/RE is nominated for this purpose.

9.1. **Stationing-**

Tower wagons are stationed at the stations nominated by the Division.

9.2. **Time limit for turning out tower wagons-**

Tower wagons, going to the spot for restoration of OHE, have to be moved on top priority just as ART. The target time for turning out the tower wagon, to go to the spot for restoration, is as under:-

9.2.1. During day light hours i.e., from 6 hrs to 18 hrs – 30 minutes.

9.2.2 During night hours i.e., from 18 hrs. to 6 hrs - 45 minutes.

The TPC and the SCOR shall both make detailed entries in the log sheets showing the time when the instructions are issued and particulars of train movements stopped. Traffic over the section in which the train movements have been stopped as above, may be resumed only with the approval of the TPC, who shall convey the instructions for the resumption of traffic to the CHC in the form of a message supported by a PN stating clearly whether any speed restrictions are to imposed.

17.09 Additional rules for electrified sections––

Special instructions for working of trains on electrified sections shall be notified by the authorized officer––

SR. 17.09.1 **Transmission and distribution by section and siding switches.**

1.1. Section and siding switches installed in the overhead equipment shall be operated only by the authorized persons.

1.2. In the event of a fault necessitating the isolation of a section in addition to the faulty one, the Electrical Foreman or Chargeman shall open the concerned switch and inform the TPC immediately.

1.3. Every Station Master shall be trained in the operation of section and siding switches in an emergency (See S.R. 17.03.5.3.4). They shall open or close such switches when called upon to do so by the TPC and shall be treated as authorized persons for this purpose. They shall lock the switches in the position advised by the TPC and shall not part with the key until it is cleared by the staff of the traction department.

1.4. No switch affecting the feed to main running line or loco line/lines shall be closed or opened without the prior written permission of the TPC. As an exception to this rule, these switches may be opened in times of emergency by the authorized persons. All operation of sectioning or isolating switches shall be reported to the TPC in every case.

1.5 Section switches are located as indicated in the diagram annexed to SWR and general sectioning diagram. These diagrams show the distinguishing numbers of section switches, the stations they control and the location of each switch.

1.6. The CHC is in direct communication with the TPC who is connected by telephone to all sub stations, track sectioning cabins and the receiving station of Power supply. All messages to the TPC regarding the operation of train services shall be routed through the CHC. In case the CHC cannot be contacted, the information shall be given to the TPC, who in turn, shall inform the CHC.

1.7. Staff employed in the electrified area shall immediately inform the SCOR by telephone as quickly as possible in the event of accident, disabled trains, unusual occurrence on overhead equipment or unusual occurrences on overhead feeders or high tension cables etc., or any occurrence affecting the working of trains and shall also inform the TPC or TLC as the case may be.

1.8. Message sent through the Station Masters shall be recorded by them and a note made in the station diary.

1.9. The SCOR shall immediately take action on the information received and promptly inform the TPC who shall take necessary action for any switching operations which may be necessary on the overhead equipment or at sub-stations and immediately inform the DEE/Tr.D and other concerned officials.

1.10. Any staff employed in the electrified area noticing sparking of wire near the overhead contact wire at bridges, structures etc., shall report this at once to the TPC. In the event of emergency circuit being cut-off, the nearest Station Master shall be contacted immediately for informing the SCOR, who should advise the TPC.

1.11. Whenever station staff notices a train worked by an electric engine passing with a hot axle/any vehicle running in dangerous condition or smoke/fire emanating from a vehicle or with any other abnormality in the running train which is likely to endanger safety of the train/passengers. The Switchman/Station Master shall immediately take steps to stop the train. In case they fail to stop such train by normal means as laid down in G & SR, then, they shall immediately inform the TPC either directly or through SCOR to switch off the power supply of the OHE of the affected section under exchange of PNs. In case TPC has been directly informed, SCOR has also to be informed subsequently.

1.12. Whenever any train gets held up for more than 5 minutes in the block section on account of no tension, the Loco Pilot of the train shall depute his Assistant Loco Pilot to check the train in order to look for any abnormality and to advise the Guard of no tension in OHE. Together with the Assistant Loco Pilot, the Guard shall check the entire train.

If , in the mean time, power supply is restored, the Loco Pilot shall call back his Assistant Loco Pilot to the locomotive and resume journey. Otherwise, after the train is checked, the Loco Pilot/Guard shall inform the SCOR/TPC of the details of abnormality, if any, or otherwise, and assistance required, through the nearest emergency telephone circuit or by other available means.

Further, the Loco Pilot and Guard shall arrange protection of the line affected in accordance with G.R. 6.03 and SRs thereunder. In case of Automatic signalling territory, the line must be protected in accordance with G.R. 9.10.

After ascertaining from the affected train of the nature of abnormality, decision regarding re-charging of the OHE shall be taken by the SCOR in consultation with CHC, Guard & Loco Pilot and then the concerned Station Masters shall be advised accordingly. Necessary steps shall be taken by CHC, thereafter, for clearance of the abnormality.

1.13 Restoration of OHE supply will be undertaken by TPC only on the advice of the SCOR under exchange of PNs.

WORKING OF TRAINS ON ELECTRIFIED SECTIONS OF RAILWAYS

1.14 If the switching off of the OHE takes place at a graded section and there is a chance that the train may start rolling, then the staff should also follow the instructions laid down under SR. 6.04 to avoid rolling down of train.

2. **Height Gauges.**

2.1. There shall always be a height gauge on each side of the overhead equipment at every level crossing, so placed as to ensure that all vehicles and moving structures passing under the height gauge without touching it will pass in the same condition under all the overhead equipment with adequate clearance. The adequate clearance shall be subject to the sanction of the CRS. The placing of the height gauge shall be according to site.

2.2. Vehicles and moving structures which will pass under height gauge without striking or touching it, may only be permitted to pass under the corresponding overhead equipment under special instruction.

3. **Sanded catch siding.**

If an electric engine or motor coach runs into the sanded length of a catch siding and dead end, the overhead equipments of the sidings shall not be made live when the engine or motor coach or any vehicles coupled thereto are standing on the sanded track until all persons have been moved away from positions where they could make contact between the permanent way formation and any part of the engine or motor coach or coupled vehicles.

4. **Rolling stock isolation of high voltage equipment.**

4.1. The High voltage electrical equipment installed in electric engines and motor coaches shall be so arranged that it will not be possible for any unauthorized person to gain access to it.

4.2. It shall not be possible to have access to high tension compartment until the power has been switched off and pantograph lowered.

4.3. Access to high tension compartment can be had only by authorized persons in possession of a reversing handle or special keys provided for this purpose. Loco Pilots and other officials to whom such keys are issued should keep them in their personal custody to prevent unauthorized persons tampering with the equipment.

4.4. No spanners or keys except those issued by the Railway Administration shall be used for operating the equipment in electric trains.

5. **No unauthorized person shall be allowed in driving compartments**.

5.1. No unauthorized person shall be permitted to enter any driving compartment of single or multiple unit trains or electric engines or to handle any apparatus contained therein.

5.2. Only certified Loco Pilots and Assistant Loco Pilots for electric rolling stock shall be allowed to drive electric rolling stock on any part of the running lines. They shall not allow any one to enter the driving compartment other than those who are authorized to do so under these rules or who hold a permit signed by the DEE/RS. No person shall be allowed to handle any apparatus in the engine or in the driving compartment unless he is in possession of a Loco Pilot's certificate of competency.

5.3. If a Loco Pilot has not driven an electric engine or multiple unit for six months, he shall be re-examined after a refresher course and his certificate of competency endorsed before he is allowed to drive again.

5.4. When a Loco Pilot has not worked on any section for six months and over, he shall not be booked on that section unless he has learnt the road and a competency certificate has been issued in his favour. A record of all competency certificates issued to Loco Pilot shall be maintained in the office of the DEE/RS.

5.5 However, staff under training for driving electric engines, when specially authorized by the DEE/RS may drive such engines under the supervision of a certified instructor. While a trainee is driving under these conditions the supervising instructor shall keep a

continuous watch over the trainee and keep himself in readiness to take any action that may be required to control the train in an emergency.

5.6. No person shall be allowed to move any electric rolling stock within the limits of the loco shed and stabling sidings unless he has been certified competent to do so by the AEE/RS.

5.7. Assistant Loco Pilots may be allowed to drive the engines on certain sections as specified by the DEE/RS under direct supervision of a Loco Pilot. In cases of emergency the Assistant Loco Pilot is authorized to drive the train at a restricted speed not exceeding 40 Kmph up to the nearest point where he can be relieved.

5.8. A Driving Inspector is authorized to drive an electric loco and will work at least 160 kilometres in a calendar month and this should cover the entire electrified section.

5.9. Line chargeman and other maintenance staff who are required to attend defective equipment are allowed to handle the equipment in running train. They shall however, do this with the utmost care to ensure that the safety of train and the equipment is not endangered in any way.

6. **Train lights.**

At night and in thick or foggy weather, no single or multiple unit train shall be worked outside station limits unless it has,

6.1. At least one head light and two marker lights or a head light and a set of code lights of the nature prescribed by the Railway Administration, and

6.2. Two red tail lights, provided either in separate fittings or in a single fitting as prescribed by the Railway Administration.

6.3. The normal head and marker lights shall be exhibited as per Rule 4.14 and SRs hereunder.

7. **Duties of Loco Pilots before taking train on to running line.**

7.1. A Loco Pilot shall not take his train on to a running line until he has tested all the control power and brake apparatus and found them in proper and prescribed working order.

7.2. The Loco Pilot shall in addition carry out the inspection and tests in accordance with special instruction issued by the DEE/RS.

7.3. When taking over charge from another Loco Pilot, it shall be his duty to ascertain whether any defects exist and the handing over Loco Pilot shall acquaint the relieving Loco Pilot of any faults or defects likely to affect the working of the train.

8. **Coupling single and multiple unit trains––**

When coupling single or multiple units or coaches of any such units together, the Loco Pilot shall be responsible for observing that all electrical couplings are properly made. After all couplings have been made, the Loco Pilot taking over the complete train shall satisfy himself that the control and power apparatus and brakes of the complete train are in proper and prescribed working order.

9.**Trains when coupled to be considered as one train––**

When trains are coupled together, they shall be deemed to be one train. Only one Master Control shall be in use at any one time.

10. **Loco Pilot to be in the leading driving compartment.**

10.1. Loco Pilot shall be in the leading driving compartment when the train is in motion or when the train is standing on any running line except as otherwise prescribed in the rules contained in this chapter.

10.2. The Assistant Loco Pilot shall assist the Loco Pilot and carry out his instructions.

11. **Reversing and brake handles.**

11.1. The Loco Pilot shall, when leaving any driving compartment, take the reversing handle away with him and also the independent air-brake handle on electric engines, where provided.
11.2. To keep the dead man's emergency gear ready to function during the whole time that a train is in motion, the Loco Pilot of single and multiple unit trains shall keep the

reversing handle in the forward or in the reverse position when the train is in motion and shall not move the reversing handle into off position until the train has come to a stand.
11.3. The Loco Pilot shall never relinquish possession of the reversing handle except as provided for in these rules.
12. **Driving train from any compartment other than the leading compartment.**
12.1. When an engine cannot be driven from its leading cab, the Loco Pilot shall follow the special instructions prescribed by the DEE/RS.
12.2. If the Driving apparatus in the leading driving compartment becomes defective in the case of a single or multiple unit train, the train shall be driven cautiously from the nearest driving compartment which is serviceable. In this event the Guard shall travel in the leading driving compartment and shall convey the necessary signals to the Loco Pilot. The Guard shall also sound the horn or whistle as necessary and apply the brake in case of emergency and shall be responsible for stopping the train correctly at signals, stations and obstructions. In the case of an electric engine, the train shall be driven from the trailing driving compartments by the Assistant Loco Pilot and the Loco Pilot shall remain in the leading driving compartment, and shall be responsible for the correct operation of the train. The speed of the train shall not exceed 40 Kmph.
12.3. In the event of the driving apparatus in the leading driving compartment becoming defective or in the event of it being necessary for the Loco Pilot to drive from the trailing compartment of the same locomotive or in case of multiple operation from the cab of trailing locomotive for any reason whatsoever, the Assistant Loco Pilot shall station himself in the leading compartment of the train, sound the horn as necessary and operate the Loco Pilot's brake valve handle of vacuum/air brake as required . In the event of danger of over-running or in case of an emergency, the Loco Pilot shall also apply the vacuum/air pressure, as the case may be, from the driving compartment he is occupying. The speed shall not exceed 15 Kmph. Such driving shall be resorted to only for clearing the block section.
12.4. At the first opportunity, the Loco Pilot shall inform the TLC to arrange for a relief engine.
13. **Duties of Loco Pilot when single or multiple unit train is disabled.**
In the event of a single or multiple unit train becoming disabled and an assisting engine (electric or Diesel) being obtained, the Loco Pilot of the disabled train shall hand over his reversing handle to the Loco Pilot of the assisting engine. If the assisting engine is in the rear and the complete train cannot be driven from its leading driving compartment, the Loco Pilot of the disabled train shall carry out the instructions prescribed for the Guard in SR 17.09.12.

In the event of a derailment, the TPC shall pass information to the Electrical Foreman/OHE, who will treat it as if it were a line fault and proceed to take all necessary precautions to prevent the overhead line from being damaged during the re-railing process.
14. Procedure when automatic brakes cannot be operated from leading driving compartment of a single or multiple unit train-

The procedure to be followed when the automatic brakes cannot be operated from the leading driving compartment of a single or multiple unit train without or with effective driving apparatus in the leading driving compartment and without or with disablement of train shall be in accordance with approved special instructions.
15. **Protection of single and multiple unit train stopped between stations**.

15.1. If the stoppage is caused by a defect which the Loco Pilot is competent to rectify, he shall attend to the defect provided that, if it is necessary for him to leave the driving compartment, he shall before leaving, put on the automatic brake fully and also apply the hand brake in the driving compartment. He shall advise the Guard. If the stoppage is on a grade steeper than 1 in 100, the Guard shall also put on the hand brake in the Guard's compartment and on at least two other vehicles, if available.

15.2. If the detention exceeds or its likely to exceed 10 minutes, the train shall be protected in accordance with the G.R. 6.03.

15.3 In cases where there is no competent person available in addition to the Loco Pilot and the Guard and the Loco Pilot has to go himself to protect the train in front, he shall before going, carry out the precautionary measures prescribed in para 15.1.

16. **Accident & Unusual in Electrified Territory**

1. Duties and responsibilities of Traction Power Controller (TPC), Section Controller (SCOR) and Station Master (SM) in case of no tension / fault tripping in Over Head Equipment (OHE)

(a) Fault Isolation :

(i) In an electrified section in the event of OHE failure, TPC shall immediately identify and localize the faulty section and isolate the same. In case of double and multiple line sections, he shall also isolate healthy section on adjacent track on the same route length as faulty section. The TPC shall then advise the SCOR in writing or on phone under exchange of PN, of the section found faulty and healthy section temporarily isolated.

(ii) On receipt of the advice from the TPC, the SCOR shall take action as under:

Advise Station Masters of stations on either side of isolated sections under exchange of private numbers to treat the faulty section as if the same is under 'emergency power block' and take action accordingly.

(b) On Double line section, Healthy Section Temporarily Isolated

The SCOR shall check whether any train has entered faulty section. If not he shall advise the concerned Station Master to issue Caution Order to the Loco Pilot of the first train on unaffected section to 'keep a sharp look out on the adjacent line / lines to see if there are any OHE abnormalities'. On reaching next station, the Loco Pilot should report whether or not the section over which they have passed is safe for train movement. The SCOR will advise the TPC in writing to re-energise the healthy section that was temporarily isolated.

(c) If however, a train has entered in faulty section, the SCOR shall immediately inform Station Masters of all stations who are concerned with working of train in the faulty section and also in the section in which healthy OHE is temporarily isolated, under exchange of PN, that they shall not allow any train to enter the affected block sections unless both the Loco Pilot and Guard of the first train in unaffected section have been issued Caution Order to this effect.

(i) 'Proceed with Speed not exceeding 60 Kmph during day when visibility ahead is clear and not exceeding 30 Kmph during night subject to observance of other speed restrictions.

(ii) 'Keep a sharp look out and be prepared to stop short of any obstruction which may be due to any infringement from the adjacent line/ lines and also keep a sharp lookout on the adjacent line / lines to see if there are any OHE abnormalities. On reaching the next station report whether or not the section over which they have passed is safe for train movement'.

(iii) Only after taking this action the SCOR shall advise the TPC in writing that necessary precautions have been taken to ensure safety of the train. The TPC shall then restore the feed to the healthy section, which was temporarily isolated.
(iv) Action to remove speed restrictions shall be taken by the SCOR in consultation with Station Master on receipt of report from the Loco Pilot and the Guard that the section is free of obstruction. The SCOR shall also advise the TPC of the report of Loco Pilot / Guard of the train indicating whether or not there are any infringements or abnormalities in OHE. Till such time it is decided to remove speed restriction, subsequent train shall

be allowed to enter into the section only with permission from the SCOR and shall continue to be issued Caution Order prescribing clearly the speed restriction and other precautions, as pointed out in (c) (i) above.

2. **Duties and responsibilities of TPC and SCOR in the event of any abnormality in train on electric traction necessitating 'switching off' of OHE supply :**

(i) As soon as TPC comes to know about unsafe condition of a train working on Electrified Traction, he shall immediately 'switch off' the OHE supply of both the lines of relevant sub-sector. The TPC shall then advise in writing, the SCOR of sections in which OHE has been 'switched off'.
(ii) On receipt of advice from TPC, the SCOR shall, under exchange of PN, advise Station Masters of all stations, who are, concerned with working of trains in the affected section to treat the 'dead section' as if the same is under emergency 'power block' and to ensure that no train is allowed to enter into the section.

Healthy Section Temporarily Isolated

(iii) The Station Masters will not allow any train to enter even healthy line of the affected section unless both Loco Pilot and Guard of the first train of unaffected section have been issued Caution Order to proceed with the restricted speed not exceeding 60 Kmph during day when view ahead is clear and 30 Kmph during night subject to observance of other speed restrictions and keep a sharp look out and be prepared to stop short of any obstruction, which may be due to any infringement or OHE abnormalities from the adjacent line / lines. Also advise Loco Pilot to report immediately on reaching the next station whether or not the section over which they have passed is safe for the train movement.
(iv) If the Loco Pilot of unaffected section contacts him on phone , the OHE of unaffected portion should be resumed and he will be asked to proceed with the restricted speed not exceeding 60 Kmph during day when view ahead is clear and 30 Kmph during night subject to observance of other speed restrictions and shall keep a sharp look out and be prepared to stop short of any obstruction, which may be due to any infringement from the adjacent line/lines . On reaching the next station the Loco Pilot will report whether or not the section over which they have passed, is safe for train movement.
(v) After ascertaining that there is no infringement to adjacent track, the Caution Order as indicated shall be withdrawn immediately.

Section having affected train:

(vi) After getting information from the crew of the affected train about the nature of abnormality, decision regarding recharging of the OHE shall be taken by the SCOR in consultation with CHC/Dy.CHC (Shift duty) and Controller of concerned department.
(vii) If the Loco Pilot of the affected train contacts TPC /SCOR and no defect is detected in the train, on resumption of OHE he will be asked by SCOR to clear the block section with the restricted speed of not exceeding 60 Kmph during day when view ahead is clear and 30 Kmph during night subject to observance of other speed restrictions and shall keep a sharp look out for any abnormality in the train. On arrival at the station the staff of concerned department should check the train. If no abnormality is detected, the train should resume normal speed.

3. Duties and responsibilities of the Loco Pilot and Guard in case of OHE tripping /No tension in OHE.––

(i) In cases of 'transient tripping' of OHE, the Loco Pilot shall resume normal traction and keep a sharp look out including on the adjacent line /lines to see if there are any abnormalities / obstructions and will inform the Guard through walkie-talkie or whistle code about tripping in OHE. The Guard of the train will look out for any abnormality on his train. The Assistant Loco Pilot should look back and observe his train for any abnormality.

(ii) If no tension in OHE continues, the Loco Pilot shall immediately 'switch on' the loco flasher and control the speed (not exceeding 60 Kmph at night) so as to be able to stop short of any obstruction and stop his train close to first emergency socket and will communicate with the TPC / SCOR to know the reason for no tension in OHE . The Crew should act according to the advice of control.

(iii) If it is not possible to communicate with the TPC / SCOR immediately, the Loco Pilot shall depute the Assistant Loco Pilot to get down and check the train with the Guard in order to look for any abnormality or any defect in his train including locomotive. After the train has been checked, the Loco Pilot / Guard shall inform SCOR of the abnormality and assistance required, if any or otherwise through emergency phone of other line, Walkie-Talkie, level Crossing gate or through train of other direction or by any other means of communication and act in accordance with advice of control. In case no abnormality is noticed in his train,the Loco Pilot should switch off the loco flasher.

(iv) If in the mean time power supply to OHE gets restored, the Loco Pilot shall resume normal traction as soon as he comes to know of such resumption of supply.

FORMS

E/Tr. D/2 (in two parts) –

This form will be used for exchange of messages between TPC and SCOR, when power block is to be imposed. When the TPC and the SCOR are located in adjacent rooms, the message will be made out in duplicate and will be sent to SCOR. The same will be acknowledged and the SCOR will permit on the same requisition.

E/Tr. D/3 (in two parts) –

This form will be used by TPC and SCOR for cancellation of power block on completion of the power block work. The same will be acknowledged by the SCOR.

E/Tr. D/4 –

This form will be used by TPC and SCOR for cancellation of caution order (speed restriction and lower/raise panto) imposed by TPC in the section. This will be written and sent to SCOR by TPC. SCOR will acknowledge the memo on the copy.

E/Tr. D/5 –

This form will be used by TPC for imposing speed restriction and lower/raise panto.

E/Tr. D/6 (in two parts) –

This form will be used by the field staff to permit the other departments to work on-adjacent to electrical equipment. On completion of the work, the second part will be prepared and submitted to the authorised person, who has permitted to work on/adjacent to the electrical equipment. This will be prepared in duplicate.

S.CRly.

E/Tr. D/2

Electrical Department (Traction)
Disconnection of Power

From: TPC Serial Block No …….
To: SCOR/s
Memo number …… Date …….. Time ……

Please note that the overhead equipment on the section/s mentioned below is to be made dead. This/ These section/s and the cross-overs leading to it/ them are not to be used for electrically operated traffic until further advice from me.

Station…… ……
Date …… Signature of TPC

WORKING OF TRAINS ON ELECTRIFIED SECTIONS OF RAILWAYS

Noted
……

Signature of CHC

The above sections have been blocked to all electrically operated traffic and I agree to the section/s being made dead at ……..hours to be cleared by …….hours.

Station …….
Date…….
Time ……..

……..

Signature of SCOR.

	E/Tr.D/3
SCR (Counter foil) Power block cancellation Memo No…….. Power Block on …….. Section (Kilometer)…… …… Cancelled at…… ……. Signature of TPC Time: Date: …….. Signature of SCOR	SCR Tractilon Power Controller No……Date……..Time…… Power Block cancellation memo. Power Block on sector/sub-sector/ Elementary sections…… Cancelled at ……hrs on…….(date) Please inform SMs…… That protection is no longer necessary. …… Traction Power Controller

E-Tr.D/4.

Date …… TPC
Time……

Caution order cancellation.

CHC

Please refer caution order No. TPC/CO/……..Date……
(1) Speed restriction of ……KMPH from Location…….
To Location……KMs between ……. and ……stations.
(2) To lower and raise Panto between …… and……. stations at the following Locations…….. …..Lower Panto at ……. Raise Panto at……..
Up Line

Dn Line

Received by …… Traction Power Controller.

WORKING OF TRAINS ON ELECTRIFIED SECTIONS OF RAILWAYS

No. TPC/CO/ …….. E/TRD/5

Traction Power Controller Traction Power Controller
S.C. Rly ……
Date…… Time……

Caution Order Memo

Please arrange to issue the following Caution order to all Up/Dn……trains running between…….. and …… stations till further advice.

1. To observe speed restriction of ……. KMPH from location…….
   ……. To location ……KM
2. To lower and raise Panto as follows: Lower Panto at KM ……. Raise Panto at KM……

Dn Line

Up Line

Please advise the ASMs …… To issue the Caution order and confirm.
Received by ……..

Traction Power Controller.

E/TRD/6 Serial No	E/TRD/6 Serial No
South Central Railway, Electrical Department. Permit to work on or Adjacent to Electrical Equipment. From……To…….	I hereby declare that I have withdrawn all men and materials from near the electrical equipment mentioned on the reverse. The men under my charge have been warned that it is no longer safe to work on adjacent to the same
(Name in block capitals) (Name in block capitals) Please issue a Permit to work on/adjacent to …… …… between ……hrs. and ……hrs.	The earths may be removed and the electrical equipment made ALIVE. Time…… Signature ……..

on …… Time……. Signature …..... Date……. Designation……. I hereby declare that the Electrical Equipment mentioned above is dead. It has been earthed at the following places:- (1)…… (2)…..... All other parts are alive. Time ……. Signature…… Date …….. Designation……..	Date …….. Designation…….