

SAFETY AT ENGINEERING WORK SITES

PREAMBLE :-

The imperative need for ensuring safety in execution of works either departmentally or through a contractual agency cannot be over-emphasised. It is necessary to ensure that all the safety measures are taken not only to avoid accidents but also for safety of the staff/labour engaged in the work. A large number of workmen, skilled and unskilled, are employed in the numerous works, big and small, in the Railways. Due to increased tempo of such works, large scale mechanisation and failure to adhere to prescribed safety precautions at work spots, accidents at work sites have increased. It is therefore necessary that adequate precautions be taken while executing works. In general what has been stated in the paragraphs mentioned in this booklet are only illustrative and not exhaustive. In general application of mind and general rules should govern the safety aspects. In fact, safety cannot be ensured solely through regulations. Safety consciousness has to get imbibed in the minds of all concerned through meticulous and repetitive adherence to safety rules. Safety rules should be considered as gospel and reiterated before and after every day's work.

These instructions are being issued in sub-sets one for each set of activity. The P.Way supervisors and the workmen i.e PWS, Mates, Keymen, Gangmen etc., before executing an activity on every morning and should assemble for 5 minutes and reiterate the instructions contained in the sub-set under oath to follow the instructions.

Various P.Way activities have been grouped into 8 sub-sets described as follows. Precautions to be taken while executing these sets of activities are given separately for each set. All the P.Way men have to follow them meticulously.

- A. UNLOADING & LOADING OF RAILS AND SLEEPERS.**
- B. UNLOADING/SPREADING OF BALLAST.**
- C. SLEEPER RENEWAL/DEEP SCREENING WORKS.**
- D. RAIL RENEWAL/DESTRESSING WORKS.**
- E. WORKING WITH DIPLORRY, TROLLEY & RAIL DOLLYS.**
- F. BRIDGE TIMBER/CHANNEL SLEEPER RENEWALS.**
- G. TRACK MACHINE WORKING.**
- H. ENDCROPPING & WELDING OF RAILS.**

NOTE :-

Though every care has been taken to include all track works, the P.Way works listed above may not be exhaustive. Decision on such works can however be taken on the basis of similar nature of works considered and listed above.

THE PRECAUTIONS TO BE TAKEN WHILE CARRYING OUT THE ABOVE MENTIONED P.WAY ACTIVITIES ARE GIVEN BELOW SUB-SET WISE IN THE DO'S AND DON'T'S FORM.

SUB-SET: A

PRECAUTIONS WHILE UNLOADING & LOADING OF RAILS AND SLEEPERS :-

These instructions apply to the following group of works:-

- (i) Unloading of single rails/3 rail panels from BFRs.
- (ii) Unloading of 10/20 rail panels.
- (iii) Unloading of concrete/other sleepers.
- (iv) Picking up of released sleepers & rails from section.
- (v) Loading/Unloading of materials from truck/trailer in the vicinity of running track.

I. Safety measures/precautions to be taken at the start of the work:-

DOs

- 1) Unloading and loading of Rails & Sleepers to be done only under block protection.
- 2) Unloading of Heavy P.Way materials shall be done under the supervision of a supervisor not below the rank of a P.Way Supervisor.
- 3) Ensure that the safety equipments and first aid boxes are available with supervisor and gangs AND are in good working order and in updated condition.
- 4) Ensure protection of trains loaded with track materials as per GR 15.09 and IRPWM Para 806(I). (See diagram on facing page)
- 5) Ensure that Contractor's Supervisor/Workmen are counselled about safety measures. A competency certificate to the contractor's supervisor is to be issued by the AEN, which will be valid only for the work for which it has been issued. Moreover, Contractor's supervisors should have been trained in a Training Institute of the Railway, such as Zonal Training Centre/Sini.
- 6) Ensure that the materials like rails/sleepers are evenly loaded on the wagons.
- 7) Manual unloading of PSC sleeper shall be done sleeper by sleeper. Unloading to be done with tyre support/ramp or saw dust bags to absorb the shock.
- 8) When the materials are unloaded from the trucks/trailers, ensure that the same is also done under the supervision of the P.Way supervisor. Ensure that the truck/trailer do not infringe the moving dimensions and no part of the truck/trailer under any circumstances should be allowed to come within 3.5 metres from the centre line of the nearest track, while either moving or reversing. If possible, provide a temporary fencing using nylon rope and bullies for this purpose in the area of unloading and where the road comes very close to the track.
- 9) Keep the rails horizontally parallel to the track and straight while lifting/moving.
- 10) Rails to be kept in head up position.
- 11) Ensure that no part of a rail/rail panel/sleeper infringes moving dimensions. Also they must rest in a stable condition to ensure no infringement in future as well due to vibrations.
- 12) Unloading of 10-rail panel to be done under the supervision of JE(P.Way) not less than JE-II.
- 13) While unloading 10-rail panels, at times, weld of rail panel gets stuck in roller of unloading chute and it is likely that rake is backed by PWI, which should not be done as partly unloaded panel may bend, rise above and may infringe OHE and cause danger.
- 14) Sleepers not to be unloaded in fairway side with minimum track center (4.725 M).
- 15) During unloading of 10-rail panel, it should be guided by keeping 8 to 10 trackmen with crow bar to avoid tilting & improper placement.

- 16) During unloading of rails and sleepers caution order to be given on the adjacent line for long whistle to be blown to alert men on work.
- 17) While unloading sleepers in section, it should be ensured that no sleeper hits OHE mast/signal posts/other equipments.
- 18) Chains of BFRs to be secured properly to avoid infringement.

DON'Ts

- 1) Do not allow any safety category staff working who are overdue for refresher course, to under take the work.
- 2) Don't drop/throw rails/sleepers suddenly, while unloading.
- 3) Don't unload materials to hit OHE mast or signal gear.
- 4) Don't allow any unloading of materials near track, which will be above rail level.

II Safety measures/precautions to be taken after completion of work and before leaving the site :-

DOs

- 1) After the completion of unloading of materials such as sleepers and rails or any other item which may cause infringement to the moving trains, the concerned supervisor who has got the materials unloaded, shall not leave the site unless at least one train has passed safely on the track or tracks, both up and down if it is a double line section.
- 2) After unloading they should be shifted away from track and placed on the cess in such a way that they are resting over the ground clear of any infringement and arranged in such a way to eliminate the possibility of their sliding and coming closer to the track after or during passage of subsequent trains.

- 3) It is advisable to keep the released/unloaded sleepers and small pieces of rails on cess side beyond OHE/mast before being picked-up/used. A gang should be specifically deployed after unloading to ensure this aspect.
- 4) Ensure that during unloading the balance rails/sleepers left on the DMT are evenly placed in the wagons before starting the DMT from site.

DONT's

- 1) Do not allow material train to leave site after picking up rails and sleepers from section unless it is tied & secured to the BFR properly.
- 2) Do not allow material train to leave site before clearing infringement for moving traffic.

SUB – SET: B

PRECAUTIONS WHILE UNLOADING/SPREADING OF BALLAST

These instructions apply to the following group of works:-

- i) Unloading of ballast from ballast hopper.
- ii) Spreading of unloaded ballast.

I. Safety measures/precautions to be taken at the start of the work :-

DOs

- 1) Unloading of ballast shall be done under the supervision of a responsible P.Way supervisor not below the rank of a P.Way Supervisor.
 - 2) Ensure that the safety equipments and first aid boxes are available with supervisor and gangs AND are in good working order and in updated condition.
 - 3) Ensure that Contractor's Supervisor/Workmen are counselled about safety measures. A competency certificate to the contractor's supervisor is to be issued by the AEN, which will be valid only for the work for which it has been issued. Moreover, Contractor's supervisors should have been trained in a Training Institute of the Railway, such as Zonal Training Centre/Sini.
 - 4) When unloading ballast along the track, care shall be taken that the heaps at the sides and the centre of track are cleared off the prescribed moving dimensions. There should not be a possibility of ballast rolling down due to vibration & infringing the running rails.
 - 5) Ensure protection of ballast train as per GR 15.09 and IRPWM Para 806(I). (See diagram on facing page).
 - 6) Before entering into block section, opening of doors should be checked and if all of the doors of any BOBY are not opening properly, unloading should not be done from that wagon and C&W staff should be booked on the next day.
- 7) While the ballast train is working it should be ensured that all the doors are opened and the ballast is spread uniformly. On curves, inner side door should be adjusted so that the required quantity of unloading is ensured on both the sides.
 - 8) While unloading ballast from hoppers, care to be taken in point and Xing zones, so that check rails are cleared and also gap between tongue rail and stock rail is clear. PWI in charge of work shall ensure above aspects before leaving the site of work.
 - 9) While unloading ballast from N-BOX in electrified territory, the site of unloading shall be verified in advance for implantation of at least 2.50 m. At locations where implantation is less than 2.5 m, unloading shall not be done as the door may hit the electrical mast causing unsafe situation.
 - 10) SEJs should be cleared off stone ballast after unloading.
 - 11) Ensure proper brake power of the train, before entering the block section.
 - 12) Ensure closure of side door of BCN wagon after unloading of ballast in section to avoid infringement.
 - 13) Ensure clearance of ballast properly to avoid jamming of signal rods, gears, lock bars after unloading.

DON'Ts

- 1) Do not allow any safety category staff who are overdue for refresher course, to under take the work.
- 2) Don't take ballast train into section for unloading if any hopper is having uneven load. The unevenly loaded wagon should be adjusted before taking it into the section.
- 3) In ghat sections having sharp curvature, preferably BOBY'N' should be used for even distribution of ballast on either side of rail.

II Safety measures/precautions to be taken after completion of work and before leaving the site :-

DOs

- 1) Ensure that unloaded ballast from ballast train and manually spread ballast in case of cess supply should be kept clear off moving dimensions.
- 2) Ballast shall not be unloaded over signal wires or point rods. Care should be taken to ensure that no stone is left inadvertently between the stock rail, tongue rail, check rail & nose of crossings.
- 3) Ballast which has fallen between the running rail and check rail on curves or LCs should be cleared invariably before cancellation of block.

DONT's

- 1) Don't leave site unless ballast heaps if any formed during unloading is properly profiled to clear the moving dimensions.
- 2) Ballast shall not be unloaded on LC road surface, blocking road traffic & gate operating wire.
- 3) Bond wire should be kept clear off ballast. These should not be embedded in ballast.
- 4) OHE Mast should be clear off ballast so that it can be checked whether bonding of mast with rail is intact or not.
- 5) Excess ballast should not be unloaded in rear of ballast wall in approaches of girder bridges to avoid ballast from rolling on to the riverbed.
- 6) If the ballast train has stopped during unloading, after unloading of ballast from ballast train, it should be ensured that the ballast is clear off the top table of the rail and flange way before movement of the train.

SUB – SET : C

PRECAUTIONS AT SLEEPER RENEWAL/DEEP SCREENING WORK SITES

These instruction apply to the following group of works:-

- i) Through sleeper renewal.
- ii) Deep screening.
- iii) Shallow screening.
- iv) Realignment of curves.
- v) Casual renewal of sleepers in tunnels.
- vi) Lifting/Lowering of track
- vii) Casual renewal of sleeper and fastenings over long stretches.
- viii) Overhauling of level crossings.
- ix) Screening of ballast other than deep screening.

I. Safety measures/precautions to be taken at the start of the work :-

DOs

- 1) Adjustment of gaps/de-stressing to be done before executing item i, ii, iii & iv.
- 2) Ensure protection of track as per GR 15.09 and IRPWM Para 806(1). (See diagram at facing page)
- 3) Ensure that the look out for engineering signal and whistle caution orders are issued to the trains and speed restrictions imposed where considered necessary.
- 4) Ensure that Contractor's Supervisor/Workmen are counselled about safety measures. A competency certificate to the contractor's supervisor is to be issued by the AEN, which will be valid only for the work for which it has been issued. Moreover, Contractor's supervisors should have been trained in a Training Institute of the Railway, such as Zonal Training Centre/Sini.
- 5) Ensure that the safety equipments and first aid boxes are available with supervisor and gangs AND are in good working order and in updated condition.
- 6) At deep screening work site, ensure adequate number of wooden chocks to support the rail/sleeper. Additional precautions should be taken before passing any train over the work area, even at restricted speed. The wooden chocks should not be used as columns but as base support with adequate area of base for stability. The wooden chocks should be placed one over the other in a stable manner. Wooden wedges should be available and driven firmly below the rail, to ensure proper support, before passing of train.
- 7) Inform electrical TRD staff for change in implantation during realignment work in electrified area.
- 8) Inform S&T staff before taking up work of realignment in Point and crossing zones.
- 9) Ensure the fixing of bond strip with OHE Mast.
- 10) Use Jumper cable in fish plated/RF/WF prone areas in traction length before undertaking repair.
- 11) Do careful recording of versine before and after realignment.
- 12) Replace the missing and ineffective fittings.
- 13) Replace the defective sleepers and rails before realignment.
- 14) Ensure noting the obligatory points (like level crossing, bridges, platforms, signal post etc.) while recording of versines.
- 15) Before passing any train over deep screening/sleeper renewal site, gauge & cross level should be measured to ensure that the track is in safe condition.
- 16) While lifting in curves, both inner and outer rail to be lifted simultaneously. In transition lengths, care to be taken that cant gradient is not increased.

- 17) After TRR, combination fishplates are provided at joining of rails of different sections. Such combination fishplates are prone to fracture. In such cases gapless and frozen combination joints along with tension plates should be provided with proper packing of 3 sleepers on either side.
- 18) At deep screening site, all welds at the site of work to be joggled.
- 19) Ensure that lifting of track at any time should not exceed 50mm.
- 20) All track maintenance and other works on LWR/CWR/SWP are to be taken up according to rail temperature.
- 21) After deep screening and during TSR of PSC sleepers, ensure pasting of rubber pads with glue, greasing of pandrol clips, inserts and liners and also rail contact area.
- 22) During driving of rail screws on PSC sleeper on points and crossings, level crossing and any other places, it should be greased before inserting.
- 23) Make the level of road same as that of track at Level crossings.

DON'Ts

- 1) Do not start any work without the presence of the Railway supervisor at site.
- 2) Don't open LWR track for more than 30 sleepers continuously.
- 3) Don't do lifting of track for more than 50mm without caution order.
- 4) Don't do casual renewal of sleepers without caution order and without leaving 30 sleepers' spacing in LWR/CWR.
- 5) Don't keep road surface/check rail in level crossings in open condition without caution order.

- 6) Don't damage the track fittings like rail bonding wires, lead wires to rails bottom legs, jumper wires etc. during track maintenance.
- 7) Do not realign the curve when 6 joints or more are jammed in SWR.
- 8) Do not infringe the standard dimensions during realignment of curve (i.e. centre to centre on double line, fixed structure near the track).
- 9) Do not realign (during Through sleeper renewal, Deep screening, Realignment of curves and Lifting/Lowering of track) the curve until necessary speed restriction is imposed.
- 10) Do not lift the track during realignment.
- 11) Do not allow trains at full speed after realignment of curve until the track is consolidated as per the LWR manual.

II. Safety measures/precautions to be taken after completion of work and before leaving the site :-

DOs

- 1) Ensure proper ramping after lifting.
- 2) Ensure that all the sleepers are packed properly.
- 3) If it is inescapable to stop the days work on a curve during PQRS work, special attention is to be given to ensure gauge face matching at the junction of new track & old track.
- 4) Ensure 4 fish bolts at all joints on the service rails after PQRS work.
- 5) Ensure that flange way inside the check rails of Level Crossing is clear from mud and dust.
- 6) Ensure that no wooden chocks are left underneath rail/sleeper by the closing of work.

- 7) Ensure that the screened muck from deep screening, do not fall over junction boxes, rodding of wires and do not block doors of location boxes.
- 8) Ensure that P.Way materials & fittings are not be embedded in ballast.

DON'T'S

- 1) Do not clear traffic block without providing proper ramp at PQRS work site.
- 2) Do not forget to carry 2 jacks of 10 T capacity along with PQRS portals.
- 3) Don't leave any unscreened stretch in between two screened stretches.

SUB – SET : D

PRECAUTIONS AT RAIL RENEWAL/DE-STRESSING WORK SITES

These instructions apply to the following group of works:-

- i) Through Rail Renewal.
- ii) Casual renewal of rails.
- iii) Destressing of LWR.
- iv) Replacement of SEJ or replacement of buffer rails with SEJs.
- v) Insertion or replacement of glued joints.
- vi) Adjustments of gaps in SWR.
- vii) Adjustment of creep.
- viii) Cuttings of rails in-situ.
- ix) Insertion/renewal of stock rail/tongue rail.
- x) Manual Renewal of Turnouts.

I. Safety measures/precautions to be taken at the start of the work :-

DOs

- 1) Traffic block must be taken before removing any rail and causing discontinuity in track.
- 2) Before renewal/insertion of tongue rails/stock rail, ensure availability of fitting & fastenings of required size and numbers (heel block, distance blocks, junction fish plates, half headed bolts etc).
- 3) Ensure that the "Observe Engineering Signals" and "Whistle" caution orders are issued to the trains and speed restrictions imposed where considered necessary.
- 4) Ensure protection of track as per GR 15.09 and IRPWM Para 806(I). (See diagram at facing page). In case rails are required to be moved crossing any adjacent line in double line or triple line section traffic block along with track portion for the small period of time which is required to cross the rails over the adjacent track/tracks, should also be ensured.

- 5) Ensure that Contractor's Supervisor/Workmen are counselled about safety measures. A competency certificate to the contractor's supervisor is to be issued by the AEN, which will be valid only for the work for which it has been issued. Moreover, Contractor's supervisors should have been trained in a Training Institute of the Railway, such as Zonal Training Centre/Sini.
- 6) Ensure that the safety equipments and first aid boxes are available with supervisor and gangs AND are in good working order and in updated condition.
- 7) Ensure correct clearance of the check rail during rail renewal at Level Crossings.
- 8) Box anchoring of adjoining sleepers should be done where signal rodding crosses the track
- 9) Examine the condition of stock and tongue rail carefully before renewal.
- 10) Provide adequate creep anchors to arrest creep wherever required.
- 11) Fix gauge tie plate correctly for all switches.
- 12) Renew fittings for one sleeper at a time.
- 13) Do treat the SWR as important as LWR.
- 14) Oiling and greasing of ERC/Pandrol clips should be done on one sleeper at a time keeping atleast fifteen sleepers intact.
- 15) Do carry rail thermometer for observing rail temperature.
- 16) Before TRR, if the rails are brought inside the track, the rail ends are to be properly secured with wooden gutkhas etc. so that it does not infringe hanging parts.
- 17) In case of points and crossings renewal, tongue and stock rails together with approach rails are also to be renewed. This would result in optimum utilisation of rail life.

- 18) In case of renewal of gauge face worn out rails, both rails at the Fish plated joints should be changed to have uniform gauge face at joint.
- 19) Ensure USFD testing before rails are laid in track.
- 20) Ensure that all fish bolt holes are chamfered.
- 21) During TRR on PSC sleepers, greasing of pandrol clips & inserts to be done, and rubber pad to be checked/changed.

DON'Ts

- 1) The Contractor shall not start any work without the presence of the Railway supervisor at site.
- 2) Do not undertake pulling back of rails, greasing of fish plates, rail dolly work, without proper track protection. In case of deep cutting and visibility being obstructed, rail should not be carried by rail dolly without block protection.
- 3) Don't do changing of rails, without block protection.
- 4) Don't open LWR track more than 30 sleepers continuously. Moreover, opening should be done only within $t_d + 10^{\circ}\text{C}$ and $t_d - 30^{\circ}\text{C}$.
- 5) Don't do Jim-Crowing of rails without proper track protection and without availability of hydraulic jim crow and joggled fish plates with clamps at site.
- 6) Don't do cutting of rails on track without proper track protection and without availability of Joggled fish plates & clamps/fishplates and bolts at site.
- 7) Don't open rail without providing jumper in electrified area.
- 8) Do not use rails for casual renewal, which are not certified good by USFD test.
- 9) Don't keep road surface/check rail in level crossings in open condition.

- 10) Don't do opening of track in LWR/SWR territory if Rail thermometer is not working.
- 11) Don't place any tool or metal object to touch/cross two rails in the track, which may cause short circuiting.
- 12) Don't use worn out, scabbed and defective rails for renewal work.
- 13) Don't damage the track fittings like rail bonding wires, lead wires to rails bottom legs, jumper wires etc. during track maintenance.
- 14) Don't do casual renewal of rails on LWR/CWR and welding of such rail without at least doing partial de-stressing of 100m length on either side of LWR/CWR.
- 15) Don't keep any weld in track without testing it ultrasonically. In case of any casual renewal of rail the weld should be joggle fish plated & provided with wooden chocks till it is tested.
- 16) Don't use gas for cutting rails/drilling holes.

II Safety measures/precautions to be taken after completion of work and before leaving the site :-

DOs

- 1) Spike down/screw down all loose fittings, especially on girder bridges.
- 2) Ensure that flange way inside the checkrails of Level Crossing is clear from mud and dust.
- 3) Ensure that released rails and other heavy material are shifted away from the track and stacked properly.
- 4) Tie angles with plate screws should invariably be fixed on PSC sleepers at SEJ, Bridge approaches & Points & Xings.
- 5) Ensure that the dip lorries are taken to the nearest manned LC/Gang hut and secured with chain & pad lock.

6) Plate screws should be inserted after application of grease.

DON'Ts

- 1) Don't forget to reconnect the traction bond wire after machine packing.
- 2) Don't use rail closure on running line as a regular measure without a chowkidar and speed restriction of 30 kmph.
- 3) Don't leave any loose fittings on girder bridges.
- 4) Don't damage the track fittings like rail bonding wires, lead wires to rails bottom legs, jumper wires etc. during track maintenance.

SUB – SET : E

PRECAUTIONS WHILE WORKING WITH DIPLORRY, TROLLEY & RAIL DOLLYS

These instructions apply to the following group of works:-

- i) Working of dip lorry.
- ii) Working of motor trolley.
- iii) Working of push trolley in heavily graded sections.
- iv) Working of push trolley in sections where visibility is obstructed/restricted.
- v) Working of push trolley in long tunnels.
- vi) Working of rail dolly.

I. Safety measures/precautions to be taken at the start of the work :-

DOs

- 1) Ensure that Valid Trolley Permit and Trolley Insulation Certificates are available.
- 2) Ensure that brakes of push/motor trolley & Dip lorry are in working order.
- 3) Ensure that sufficient men are available at all times to remove rail dolly/dip lorry/push trolley before putting it on track.
- 4) Ensure that the safety equipments and first aid boxes are available with supervisor and gangs AND are in good working order and in updated condition.
- 5) Trolley and Lorry should be protected as per Para 1118 - B and 1120(c) of IRPWM. (See diagram on facing page)
- 6) Paint all the dip lorries in orange colour and write **“Not to be put on track without block and without banner flag protection”** in regional language.
- 7) At the location of curves in cuttings or at other places, where the view of the line is restricted, “observation posts”

should be established at such sites so as to command the best view in both directions for the use of Flagmen, thus enabling hand signals being conveyed to the trolley on line.

- 8) In Ghat sections, on sharp curves and where visibility is not clear one board to be put to remind the user of push trolley M/trolley, Dip lorry that *“You are entering in dangerous area where visibility is restricted”*.
- 9) Push trolley, Material lorry, Motor trolley and dip lorry should be placed parallel to track after removal from track.
- 10) Ensure availability of field telephone while proceeding to section by push trolley.

DON'Ts

- 1) Do not allow any Safety category staff who are overdue for Refresher course to undertake any work.
- 2) Do not place trolley, Motor Trolley or Lorry on the line except by a qualified person who shall hold a certificate of competency for operating it.
- 3) Do not attach trolley/Motor Trolley/Lorry to any train.
- 4) Don't use torn/discoloured hand signal or banner flag.
- 5) Don't allow any persons other than Railway staff to travel in Push Trolley/Motor Trolley. For outsiders necessary Indemnity Bond must be got executed.
- 6) Don't use Push Trolley as material trolley.
- 7) Don't carry heavy material loaded on Dip lorry without block.

II. Safety measures/precautions to be taken after completion of work and before leaving the site:-

DOs

- 1) Ensure that at loading and unloading points of rails/ sleepers by dip lorry, no infringement should take place to the moving dimension.
- 2) After completion of the work, rail dolly/dip lorry, push trolley etc. should be removed from track and kept clear off the moving dimensions. The dip lorry should be chained and padlocked and kept at station or at manned level crossing or gang hut.

DON'Ts

- 1) Don't leave push trolley/rail dolley on track in unmanned condition.

SUB – SET : F

PRECAUTIONS AT BRIDGE TIMBER/CHANNEL SLEEPER RENEWAL SITES

These instructions apply to the following group of works:-

- i) Through renewal of bridge sleepers.
- ii) Casual replacement of bridge sleepers.
- iii) Change of guard rail on girder bridges.
- iv) Rail renewal over bridges.

I Safety measures/precautions to be taken at the start of the work :-

DOs

- 1) Ensure that the look out and whistle caution orders are issued to the trains and speed restrictions imposed where considered necessary.
- 2) Ensure protection of track as per GR 15.09 and IRPWM Para 806(I). (See diagram on facing page)
- 3) Ensure that Contractor's Supervisor/Workmen are counselled about safety measures. A competency certificate to the contractor's supervisor is to be issued by the AEN, which will be valid only for the work for which it has been issued. Moreover, Contractor's supervisors should have been trained in a Training Institute of the Railway, such as Zonal Training Centre/Sini.
- 4) The contractor should preferably provide accident insurance cover to the labourers employed by him for the work.
- 5) Ensure that safety equipments and first aid boxes are available with supervisor and gangs AND are in good working order and in updated condition.
- 6) Spike down/Screw down all loose fittings, especially on Girder bridges as per required size.
- 7) Scaffolding and staging should be sufficiently strong to take the load of the materiel and men required to execute and inspect the works.
- 8) Heavy materials such as rails, scaffolding hooks, etc. should not be taken on the bridge without adequate protection by the engineer's representative, as per the General and Subsidiary Rules for the Railway.
- 9) The Contractor should ensure that the labour engaged by him do not feel giddy while working at heights or while walking over the bridge sleepers on girder bridges.
- 10) On bridges where there is a risk of persons falling and drowning, necessary equipment such as safety jackets etc., should be kept ready by the contractors.
- 11) Inflammable articles such as petrol, oil etc. should be stored separately from other materials and all prescribed precautions as per the Indian Explosives Act are to be taken.
- 12) All regulations of Central and State Governments and Local bodies should be fully followed by the contractor.
- 13) Keep clothings and shoe free from grease or other substances which may cause slipping.
- 14) Keep vigil over passing trains.
- 15) Insist your staff to be very careful while walking and moving through footpaths/any other member of bridge.
- 16) Ensure the pathway on bridges is in working condition.
- 17) Say no to liquor or any other sedative medicine.
- 18) No chit chatting or fun etc. while on work.
- 19) Track men should wear boots while working on girder bridges.
- 20) Sand buckets/bins should be filled with clean sand.

- 21) Before renewal of bridge timbers with channel sleepers, the alignment and level of girders to be corrected so that there is no alignment and level defect after renewal with channel sleeper on girder.
- 22) In case of TBTR on major bridges, temporary path way is to be provided on both sides for safe working.
- 23) No semi-spiked or un-spiked walkway to be kept on track.
- 24) All the trackmen must wear the orange colour vest (uniform) for ensuring visibility from a distance.
- 25) Men working on bridge should use safety belt.
- 26) On very high bridges and for bridges of more than one span during heavy work such as Through Renewal of rails, sleepers etc., safety net to be used under each girder.
- 27) During renewal of channel sleeper on electrified section, ensure earthing of girder bridge.

DON'Ts

- 1) The Contractor shall not start any work without the presence of the competent Railway supervisor at site.
- 2) Don't remove any rail without full block protection and protection of track as per GR 15.09 (See diagram on facing page)
- 3) Don't open rail without providing jumper in electrified area.
- 4) Don't leave any loose fittings on girder bridges.
- 5) Scaffolding, staging etc. should not infringe the prescribed Schedule of Dimensions of the railway.
- 6) Don't wear too loose or too tight dress, which may hamper ones free movements.

- 7) Don't forget ones eye sight glasses when climbing up or down substructures and superstructures.
- 8) Don't follow short cut methods in violation of traffic and block rules.
- 9) Don't damage the track fittings like rail bonding wires, lead wires to rails bottom legs, jumper wires etc. during track maintenance.
- 10) Don't jump from one member to another while working on bridge.
- 11) Don't allow any defective rails on bridge, such rails should be removed immediately.

II. Safety measures/precautions to be taken after completion of work and before leaving the site :-

DOs

- 1) Spike down/screw down all loose fittings, especially on Girder bridges.
- 2) Ensure Zero Missing Fittings on Girder Bridges and their Approaches.
- 3) Before leaving the site ensure that released channel sleepers, bridge timbers etc do not infringe the moving dimension. They should be stacked properly outside the bridge.
- 4) Post a chowkidar at bridge site during night to prevent sabotage activities, since lot of P.Way materials remain on the approach of the bridge.

DON'Ts

- 1) Inspector/Supervisor incharge of the work should not leave bridge site without ensuring that the bridge and its approaches are in safe condition.

SUB – SET : G

PRECAUTIONS AT TRACK MACHINE WORKING SITES

These instructions apply to the following group of works:-

- i) Deep screening by BCM.
- ii) Points & crossings renewals by T-28.
- iii) Sleeper renewal by PQRS.
- iv) CTR by TRT.
- v) Working of other track machines.

I. Safety measures/precaution to be taken at the start of the work:-

DOs

- 1) No 'on track' machine should be taken into a block section without full block protection.
- 2) Ensure that the long whistle and look out caution orders are given to all trains running on adjoining line while machine works in section.
- 3) Ensure protection of track machine in block section as per GR 15.09 and IRPWM Para 806(I). (See diagram at facing page)
- 4) Ensure the availability of sufficient number of skilled & unskilled labours, tools & plants, critical fittings & pre-block arrangement done before traffic block.
- 5) Suitable flagman/detonators/banner flags shall be provided where necessary for protection of trains on adjacent line, if required. In all cases, however, a flagman will be provided with HS flags for slowing down/stopping approaching trains on adjacent line to meet with any unforeseen situations. Another whistlemans preferably having a powerful hooter should stand on the adjacent line and near the working

machine so as to warn the workers on the blocked line of any trains approaching on the adjacent line.

- 6) Ensure that Contractor's Supervisor/Workmen are counselled about safety measures. A competency certificate to the contractor's supervisor is to be issued by the AEN, which will be valid only for the work for which it has been issued. Moreover, Contractor's supervisors should have been trained in a Training Institute of the Railway, such as Zonal Training Centre/Sini.
- 7) Ensure proper ramping during lifting.
- 8) The Machine operator shall be fully conversant with the rules of emergency and the aspect of signalling in the area.
- 9) The track machines shall work under the direct supervision of an Engineering official not below the rank of JE-II (P.Way).
- 10) During night working, keep strict vigil on the approaching trains on the adjacent line. Keep sufficient lighting arrangement.
- 11) Each Track Machine shall carry all safety equipments as per specifications and updated condition.
- 12) Sufficient Nos. of wooden blocks should be available in T-28 machine for crawling of machine while crossing yard lines without damaging signal rods.
- 13) Ensure clearing of ballast over sleepers to make them visible to the operator for tamping.
- 14) Do clear all obstructions such as signal rods, cables, pipes, level crossings, guard rails, etc. likely to be damaged by the tampers. These should be clearly marked and made known to the tamping operator before the start of work.
- 15) During working of TRT and PQRS, workmen's safety is very important, as there are many moving parts and machines operating in the working area simultaneously. Specific men to be deployed to observe movements of machine and to whistle.

- 16) Ensure machines are manned by operators only having competency certificate.
- 17) Ensure routine inspection/checking of machine before availing block, to improve efficiency.
- 18) Ensure that 2 jacks of 10 T capacity are always available with PQRS.
- 19) Ensure availability of sufficient ballast before BCM working to enable track certification.
- 20) Ensure track is earthed during working of TRT and PQRS. On PQRS working A.T. should also be earthed.

DON'Ts

- 1) The Contractor shall not start any work without the presence of the Railway supervisor at site.
- 2) Don't do lifting of track more than 50mm without caution order.
- 3) Don't use rail closure on running line as a regular measure without a chowkidar and adequate speed restriction.
- 4) Don't move the machine from one block section to another block section, without proper authority to proceed.
- 5) Don't spread any part of the machine to foul the adjacent track.
- 6) Don't run the machine at more than maximum permissible speed sanctioned for that type of machine on that section.
- 7) Don't do tamping, if sleepers are broken/damaged & if fittings are missing.
- 8) No person should walk or stand on adjacent track. Advice trackmen & machine staff to remain only on track blocked for machine working.

- 9) Don't climb on the top of the machine on electrified area.

II. Safety measures/precautions to be taken after completion of work and before leaving the site:-

DOs

- 1) Ensure that no track materials are left at site infringing the moving dimensions.
- 2) After operating of machine track readings should be taken and recorded in register to ensure track is in safe condition.
- 3) Re-fix check rails at LC and traction bond wires after the completion of machine work on same day.

DONT's

- 1) Do not clear traffic block without providing proper ramp at PQRS work site.

SUB – SET : H

PRECAUTIONS DURING ENDCROPPING & WELDING OF RAILS AT WORK SITES.

These instructions apply to the following group of works:-

- i) Carrying out welding of rails at site.
- ii) In-situ welding of rails.
- iii) End cropping and welding.
- iv) In-situ reconditioning of points and crossings.
- v) Lubrications of rail joints by gangs.

I. Safety measures/precaution to be taken at the start of the work:-

DOs

- 1) Through End cropping and welding work should be carried only on cess and such weld panels should be placed in track as Rail Renewal.
- 2) No welding of rails in track should be done without adequate traffic block.
- 3) While doing in-situ welding, ensure protection of track as per GR 15.09 and IRPWM Para 806(I). (See diagram in facing)
- 4) Ensure that the look out and whistle caution orders are issued to the trains in case welding is being done on cess.
- 5) Ensure that Contractor's Supervisor/Workmen are counselled about safety measures. A competency certificate to the contractor's supervisor is to be issued by the AEN, which will be valid only for the work for which it has been issued. Moreover, Contractor's supervisors should have been trained in a Training Institute of the Railway, such as Zonal Training Centre/Sini.
- 6) Ensure that the safety equipments and first aid boxes are available with supervisor and gangs AND are in good working order and in updated condition.

- 7) Welders engaged in welding works should be provided with welders protective eye shields.
- 8) A thermit welding done at site shall be joggled fishplated with 4 clamps and supported on wooden block and protected by 30 kmph speed restriction till tested good by USFD.
- 9) Ensure no mis-alignment specially on the gauge face of the thermit weld.
- 10) Welding in cess should be carried out on proper cess and not on the ballast shoulder.
- 11) A.T. weld should be cleaned of moulding sand and dust before passing the train, to inspect visually for intact welding before joggling & clamping.
- 12) Ultrasonically untested rail should not be welded.
- 13) No A.T. welding should be carried out by any person who does not hold a competency certificate.
- 14) Rain guard to be used if it rains suddenly during welding process.
- 15) Trains should be allowed to run only after adequate trimming and grinding and cooling of welds have been completed.
- 16) Adequate rail closures should be available at site. After fixing rail closures a speed restriction of 30 kmph should be invariably imposed.

DON'Ts

- 1) The contractor shall not start any work without the presence of the Railway supervisor at site.
- 2) Don't do cutting of rails on track without proper track protection and without availability of joggled fish plates at site.
- 3) Don't open rail without providing jumper in electrified area.

NOTES

- 4) Do not paint (by epoxy) weld collar before USFD Testing.
- 5) In case of in-situ welding, don't pass the first train over newly welded joint without its rough grinding, joggled fish plating and supporting by wooden blocks.
- 6) Don't pass the train within 30 minutes after pouring the molten metal.
- 7) Don't weld rails having bolt holes at the ends.
- 8) Don't use consumable items like portion, luting sand if their validity has expired.
- 9) Don't carry out in-situ welding during inadequate traffic block.
- 10) Don't carry out welding in rain.
- 11) Don't use short cut method during welding process.
- 12) Don't use portions unless it is properly tested and passed by authorised officer.