



No. L.326 OP Spl Drive / 33

Date: 14.06.2024

CEE (OP) Instruction No. 9/2024

Sr.DEE/TRO/BB, BSL, NGP
Sr.DME /Fr& Op/BB,
DME /O&C/SUR,
DME /Op/PA

Sub: Drive for fire prevention of electric and diesel locomotives
Ref: Railway Board's L. No. 2024/Elect(TRS)/113/3(fire) dated 13.06.2024
(Copy enclosed)

Enclosed find a copy of above referred letter which is self-explanatory. Divisions are requested to instruct all CLIs/Supervisors to counsel all loco running staff on the items related to crew. Also, instructions to be given to all trip shed in-charges to implement the guidelines pertaining to fire safety. All loco running staff and maintenance staff should be given training for swift and correct operation of fire extinguishers. It should be ensured that all the items enclosed in Annexure A, B, C, D, vide above referred letter to be thoroughly checked during every inspection without fail.

Some of the important items to be checked in Trip shed are as under:

For Electric locos:

1. BA/TK panel (EPM contactors, CTF reversers) – Contactors should be checked for flash over.
2. General (Locomotive body) - All the drain pipes meant for draining out of excess compressor oil, transformer oil should be maintained in proper condition and checked during every inspection of locomotives.
3. Auxiliary motors - Even a slight oil leakage from MPH should not be permitted for long in service.
4. Under-frame and other equipments-
 - a. The under frame brake rigging items should be kept in cleaned condition, specially, in the vicinity of brake blocks and wheels. There should not be accumulation of polythene items, paper and animal dung to avoid smoke emission due to likely sparks from brake blocks or otherwise.
 - b. Traction motor body, junction boxes also should be kept in cleaned condition in every inspection.
 - c. The removal of muck and foreign materials from the cable carrying ducts, junction box in the under frame of locomotive should be ensured during AOH, IOH and during lifting of locomotive.
 - d. Cleaning of panto foot insulators, roof line insulators, insulators of DJ/VCB, lightening arrester, bushing portion on the roof of the locomotive should be kept in cleaned condition during every inspection of locomotive. The accumulation or presence of any form of foreign material should be immediately attended.

5. Transformer & GR – Working of PHGR should be ensured in every inspection of locomotives.
6. Relays – Ensure that rating of CCPT fuse has been reduced to 10 amps from 16 amps.

For Diesel locos:

- (a) No leakage of lube oil and fuel oil.
- (b) Fuel cross over pipe is properly secured and is not rubbing with engine block.
- (c) Engine room must be maintained oil free and no foreign material like cotton waste etc are lying there.
- (d) Oil spillage from diesel engine into the alternator/ generator room to be prevented.

Important instructions to the crew:

For conventional locos:

1. Wedging of 044 relay should be strictly prohibited.
2. In case of QOP dropping following instruction must be followed-
 - (a) Locomotive should be **taken** for thorough investigation and checking to the nearest loco sheds, if any traction motor is isolated by the driver on line.
 - (b) The working of locomotive with HQOP at off position should be restricted to the nearest trip checking point or loco changing point, preferably the working of train for one or two block section should only be permitted.
 - (c) During working with HQOP at OFF position driver should be advised to have constant watch in HT compartment, rectifier and BA panel area and he should more frequently look back for any smoke emission from traction motor.
 - (d) Driver should closely monitor of all the blower motors if corresponding air flow relay is isolated. The same should be attended at the nearest trip inspection point or Electric Loco Shed.
 - (e) Drivers, Loco Inspectors and maintenance staff should be given training for swift and correct operation of fire extinguishers.

For 3-phase electric locomotives:

3. Whenever the VCB trips while hauling a train with **3-phase electric locomotives**, the LP & ALP should immediately check/read the DDS message carefully on the display screen of computer in the cab for the associated fault.
4. In case the VCB has tripped through primary Over Current Relay with Priority 1 fault message the Loco Pilot/Assistant should immediately inspect the Machine Room carefully looking for any signs of fire/smoke, spread/ spillage of oil especially near converter/ transformer area and extinguish the same by using portable fire extinguisher.
5. Primary Over Current Relay in **3-phase electric locomotives** is just like QLM relay in conventional electric locomotives and its operation should attract attention of the running staff in the same **manner** as for QLM relay.

- b. In case of larger fire specially over traction converter and transformer area the cocks of 22.5 kg CO2 cylinder provided in the locker on ALP side should be operated in both the cabs, keeping the Machine Room door in closed condition.
7. If no signs of fire/smoke are observed, LP should close the VCB only once more if the same trips again with Over Current Relay, the control electronics will be automatically switched off and panto lowered by software. The LP/ALP should not try to switch 'ON' the control electronics or close VCB again and they should immediately ask for assistance from TLC.
8. Any case of fire/smoke message from Fire Detection Unit (FDU) appearing on display screen with/without tripping of VCB should not be ignored and crew should inspect the machine room thoroughly and look for any signs of smoke/fire/overheating/spark from equipment/joints and take further action accordingly.
9. It should be ensured that the LP & ALP running **3-phase electric locomotives** are fully conversant with the display messages of fault available in the display screen of the computer. Refresher Courses should be arranged for new LPs/ ALPs at shorter intervals initially and later on based on this experience, this may be increased. The importance of Priority 1 and Priority 2 faults and their consequences should be explained to them.

In view of above, one month drive to be launched at divisional level. The reply of the drive to be given in the following format after completion of drive-


1. No. of officers / shed Supervisors/CLIs involved:
2. No. of locos examined:
3. No. of irregularities along with nature of irregularity noticed:
4. No. of irregularities attended:

For counseling of loco running staff, the compliance to be given in the following format-

1. No. of Officers/CLIs involved:
2. No. of staff counseled (Category wise):

The reply should reach to this office latest by 18.07.2024.

DA- As above

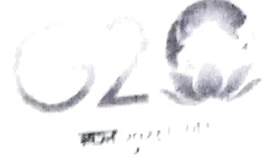
 14.06.2024

(H. M. Sharma)
Chief Electrical Engineer (OP)

CI- PCEE – For information please.
CI- CMPE (DSL) – For information & necessary action.



भारत सरकार Government of India
रेल मंत्रालय Ministry of Railways
रेलवे बोर्ड (Railway Board)



No. 2024/Elect.(TRS)/113/3 (fire)

New Delhi, Dated : 13.06.2024

General Managers (Elect.),
All Zonal Railways

Sub: Drive for fire prevention of electric and diesel locomotives.

There have been cases of fire on various rolling stocks on IR. Besides general cleanliness of machine room on locomotives, the following guidelines pertaining to fire safety may be implemented :

- (i) Maintenance / operational guidelines issued by RDSO vide letter No. EL.0.2.2 dated 08.09.2006 for fire prevention measures on electric locomotives (salient items listed in **Annexure A**).
- (ii) Fire prevention measures for conventional electric locomotives issued by RDSO vide letter dated EL/0.2.2 dated 27.07.10 (salient items listed in **Annexure B**).
- (iii) Fire prevention measures for three phase electric locomotives issued by RDSO vide letter No. EL/3.1.35/2(Elect) dated 29.01.13(Salient items listed in **Annexure C**).
- (iv) Fire prevention measures for Diesel locomotives issued vide RB's letter no 2004/M(L)/466/7101/Vol III dt 01.10.2015. (Annexure 'D')

All staff in this regard, including LP, ALP and maintenance staff should be sensitized on this issue. It is advised to launch a **one month** drive with immediate effect.

Enclosure 3 pages (Annexure A, B, C & D)

(Vijay Pratap Singh)

Additional Member(Traction)

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Extracts of RDSO's letter no. EL/022 dated 08.09.06 (Report no. ELRS/PR/0113 (Rev-'0')

Transformer, Tap changer, CGR/RGR:

➤ **Transformer:**

- DGA of transformer and GR oil should be carried out as per RDSO SMI No. 138 during every IC schedule.
- Calibration of DGA plant by a standard gas on daily basis.
- Break down value of the transformer oil and GR oil should be checked as per IS:6792/1992 during every IC.
- The centrifuging of transformer oil and GR oil should be done during every AOH besides during changing of transformer and GR.
- The cold centrifuging for minimum 4 hours must be done before the switching on the heaters of the centrifuging plant.
- Oil fill up through filtration plant only.
- During POH of locomotives, core of the transformer should be lifted for cleaning, checking, tightness of pressure bolts, gasket changing etc.
- Thorough checking of transformer and GR in case of loco tripping through QLM only.
- Maintain the oil level in winter and summer season as stipulated.

➤ **PHGR:**

- The working of PHGR should be ensured during every inspection, trip inspection or testing of locomotive.
- If the locomotive is to be attended after PHGR has stopped working for some time or PHGR is not found working, in this case the oil accumulated in the pipe line of PHGR should be flushed and cleaned with new oil.

➤ **GR:**

- Materials are procured from RDSO approved sources only.
- Replacement of material should strictly be in terms of AOH/IOH kits by sheds and POH kits by the workshops during POH.
- GR should be opened for thorough checking, flushing with oil after every 6 months.
- Oil discharge duct on tap changer should be removed and canopy arrangement should be adopted and ensured as per RDSO's modification sheet no. WAM4/187.
- Checking of transformer and GR safety valves should be done whenever GR cover is opened or transformer is taken out for maintenance.
- The filling up and topping up of the oil in GR should invariable be done from directly centrifuging plant (not manually by carrying in container).

➤ **CGR/RGR:**

- Gap between CGR contacts should be maintained as specified and CGR contact tips should always be replaced whenever, it is necessary. This is essential to minimise the arching in CGR.
- The condition of CGR archutes should be thoroughly checked during AOH/IOH/POH and should be replaced, if required.

➤ **Cables:**

- Re-cabling of locomotive having Elastomeric cables should be done after 18 years i.e. during Mid Term Rehabilitation of locomotive or second POH in freight locomotives, third POH of coaching locomotive.
- Use of neoprene base rubber insulated sheets should be extensively used for protection of cables against mechanical damage at bends or at the critical locations where there are chances of cables coming into contact with sharp edges of locomotive metallic part.
- All the cable cleats should be of SRBGF (IS.10192 UP1 grade) and procured from CLW approved sources only.
- All the cable lugs and ferrules must be of the sizes, which is suitable for a particular size of cable only.

- PVC cable bunching ties should be used as wrapping straps for securing the control and auxiliary cables.
- During the major schedules i.e. AOH/IOH/POH, all the holes through which the cables pass, should be checked for sharp edges, burrs and availability of proper size of grommets should be ensured in proper condition.
- The ferrule of traction motor connection cables should be checked during every disconnection of traction motor in locomotive i.e. during every lifting. The replacement of ferrules should be strictly as per the size of cables.
- The traction motor cable ferrules size is also to match with the size of cable connectors (PG clamps) so as to avoid any looseness of the connection in junction box or flash over. Also, to avoid cables coming out of the clamp.
- Always use proper crimping tools and ensure their calibration for proper crimping force annually.
- Proper use of heat shrinkable sleeve and fire retardant tapes at edges or the cable where conductor is exposed.

➤ Smoothing Reactor:

- Repair and maintenance of the smoothing reactors should be carried out as per RDSO Modification Sheet No. WAGS/15. Gaps between core and inner coil and gap between outer coil and inner coil should be maintained as per RDSO SMI no. 0240 dated 06.10.06, besides the other routine maintenance practices.
- Use of the materials specially SRBGF wedges, sheets, stainless steel cross channels and pressing bolts should be used. This is as per TC No. 42 issued by ROSO.
- SL cover should be opened during every IC and blowing of SL should be done for removal of dust and dirt.
- During IOH/POH of locomotive SL should be taken out for cleaning, baking and varnishing and check the condition of insulation specially at the corners.
- All the SL30 should be checked for gaps between inner coil and core and outer coil and inner coil as per Modification Sheet No. WAGS/15. If gaps are not within the permissible limit specially between core and inner coil, the SL should be taken out for repairs. This is very much essential for proper cooling of SL.

Relays & Circuits

➤ QLM

- All the QLM relays having mechanical locking arrangement should only be used.
- QLM relays should be taken out from locomotive during AOH for testing and setting on test bench. During setting, following cares should be taken –
 - (a) Relay should be set only after 20 to 25 pickup and drop out operation.
 - (b) After setting the dial should be checked which may show the different current setting from the actual. The same should be written on the relay.
 - (c) As per practice in vogue, the sealing of QLM relay has to be ensured during every inspection trip checking of locomotive. The breakage of seal is to be reported by the drivers.
- Thorough investigation of locomotive should be done for the cases having QLM dropped with any apparent reason. No locomotive should be allowed without proper trouble shooting and fact finding.
- Beside the QLM's appropriate setting, the operation of other protective relays should be ensured. RDSO SMI No. 0238 dated 20.03.2006 should be followed.
- The CT ratio of TFILM should be checked on proper test bench during IOH of locomotive. However, sheds are advised to have a drive for one round of this checking and keep the record of the same immediately. CT's with more than 5% of the ratio error should be discarded.
- The condition of air flow relays must be ensured during every inspection including the trip inspection. No locomotive should be allowed in service with air flow relay isolated except for a very short run and with a continuous watch by the crew on the associated machine.
- Use of flap type air flow relays should be discontinued and RDSO instructions and approved sources for air flow relays should be used.
- Transformer earthing connection (A0) with the locomotive body must be ensured whenever transformer is lifted and fitted back. Even sheds may ensure this connection during every inspection of locomotive visually.

- Q44 and Q118 relays should be checked for their timings in test bench during every inspection of locomotive. With the adoption relays with electronic timer, complete replacement of timer unit should be done in lieu of going into the patch repairing work. The timer should be replaced by 100% during POH of locomotive irrespective of its condition.
- Use proper gauges, tools for measurement and adjustment of contact gaps, contact pressure & dial setting and Relay room should be dust free.

Operational system

- During multiple unit (MU) operation LSOL circuit should be maintained in proper functional order. In all the locomotives it should be commissioned.

BA/TK panel(EPM contactors, CTF reversers)

- The traction motor line contactors tips should be replaced during AOH/IOH/POH of the locomotive by sheds and workshops.
- The condition of reverser drum, fixed and mobile contacts pressure and matching of contacts must be ensured during every inspection of locomotive. All low capacity reversers to be upgraded to 1500 Amp.
- Proper fixation of healthy archutes should be ensured.
- Contactors should be checked for flash over.
- Use proper size of shunts in good condition.
- Maintain proper contacts with respect to its condition contact pressure and good conditions.

General (Locomotive body)

Locomotive body:

- Cleaning of side body filter with pressurized water jet and air blowing must be done during every inspection of locomotives.
- 100% replacement of side body filter should be done during POH of locomotive by the workshops.
- All the drain pipes meant for draining out of excess compressor oil, transformer oil should be maintained in proper condition and checked during every inspection of locomotives.

Water leakage:

- All roof gaskets must be changed during POH & IOH of the locomotives. Condition must be checked during AOH of the locomotive also and same should be replaced, if found necessary.
- The rubber gasket for central hood should be checked thoroughly with respect to its condition as well as proper placement during removal of central hood along with DJ/VCB.
- All apertures and opening from doors, sky light glasses should be blocked by proper fitment of rubber gasket and sealing compound by the sheds and workshops.
- Proper securing of footplates in corridors and HT compartment area must be ensured with all fasteners intact lest there would be physical damage to control or other cables coming into contact with the loose metal's footplate.

Important instructions to the crew:

- Wedging of Q44 relay should be strictly prohibited.
- In case of QOP dropping following instruction must be followed-
 - (a) Locomotive should be taken for thorough investigation and checking to the nearest loco sheds if any traction motor is isolated by the driver on line.
 - (b) The working of locomotive with HQOP at off position should be restricted to the nearest trip checking point or loco changing point, preferably the working of train for one or two block section should only be permitted.
 - (c) During working with HQOP at OFF position driver should be advised to have constant watch in HT compartment, rectifier and BA panel area and he should more frequently look back for any smoke emission from traction motor.

- Driver should closely monitor of all the blower motors if corresponding air flow relay is isolated. The same should be attended at the nearest trip inspection point or Electric Loco Shed
- Drivers, Loco Inspectors and maintenance staff should be given training for swift and correct operation of fire extinguishers.

Rectifier:

- The condition of capacitors, especially at the terminals should be closely checked during every inspection of locomotive against any symptom of loose connection or terminal is loose. The capacitors should be replaced immediately if it develops sign of bulging, flashing etc.
- Proper indicating fuses of rectifiers should be used. In no case shorting by wires in lieu of fuse should be allowed
- The failed device of the rectifiers must be immediately changed.
- The working of locomotive bypassing the QVSI must be prohibited

Auxiliary motors:

- The rotation of MPH, MVSL, MVRH & MVSI should be carefully checked and ensured whenever the auxiliary machines are changed or disconnected.
- Even a slight oil leakage from MPH should not be permitted for long in service.
- Extra care should be given for cleaning of MPH area during all the inspection of locomotive and whenever, MPH is changed.

Compressors / Exhausters:

- The replacement of spares during overhauling or otherwise should be in the form of kit, specially for HP & LP valves to avoid throwing of excess oil and leakage.
- Use of oil and heat resistant hoses for compressor/exhauster delivery pipes should be used as per RDSO's Modification Sheet no. WAM4/137 and 130A.
- The filling up/topping up of the oil should be done with the help of proper funnel by the shed and outstation staff too.

Traction Motors:

- V-cone cleaning of the armature should be done strictly in every IC schedule.
- The condition of arching studs/horns should be closely monitored for their gaps and proper shape. The replacement of arching of studs to be done during overhauling, if there is a sign of flashing or deterioration in its shape.
- As per practice in vogue, the use of anti tracking varnish, cleaning of BHRR, proper spring tension of carbon brushes, proper use of carbon brushes etc should not only be continued but needs close monitoring and keep proper records.
- During overhauling of traction motor ovality checking during commutator turning, proper mica under cutting and proper champhearing of commutator should be done.

Under-frame and other equipments:

- The under frame brake rigging items should be kept in cleaned condition, specially, in the vicinity of brake blocks and wheels. There should not be accumulation of polythene items, paper and animal dung to avoid smoke emission due to likely sparks from brake blocks or otherwise.
- Traction motor body, junction boxes also should be kept in cleaned condition in every inspection
- The removal of muck and foreign materials from the cable carrying ducts, junction box in the under frame of locomotive should be ensured during AOH-IOH and during lifting of locomotive.
- Cleaning of panto foot insulators, roof line insulators, insulators of DJ/VCB, lightning arrestor, bushing portion on the roof of the locomotive should be kept in cleaned condition during every inspection of locomotive. The accumulation or presence of any form of foreign material should be immediately attended.

Extracts of RDSO's letter no. EL/0.2.2 dated 27.07.10

Condenser Bushing:

- These condenser bushings should be replaced with vertical take-off type Cable Head Termination Assembly as per RDSO specification No. ELRS/SPEC/BL/0003(Rev1).
- Tan delta measurement of A 33 bushing of transformer can also be measured as and when the transformer core is lifted for repair/POH.

Transformer & GR:

- Transformer gaskets should be replaced during IOH & POH schedules. However, if transformer is opened for attending any break down maintenance/failure, the gaskets should also be replaced as the used gaskets get compressed/damaged at the locations of excessive pressure which may cause oil leakage.
- When the breather is first installed, the crystals have a blue tint and after a period of operation, the colour of the tinted crystals gradually changes to pink. This is an indication that the silica gel is becoming saturated and losing its absorbent properties. When there is a preponderance of pink crystals, the gel should be changed or reactivated.
- Check the condition of wire mesh provided on bottom of breather of transformer and cleaning of same should normally be done in every IC. However, the condition of wire mesh choking should also be inspected in IA & IB schedules and based on its condition its cleaning should be undertaken. Ensure use of brass wire mesh only. Replace this wire mesh in every AOH, IOH and POH schedules.
- Working of PHGR should be ensured in every inspection of locomotive.

Cables:

- Ensure use of 10 sq. mm cables from HBA to HOBA cables in place of 3 sq. mm cables.

Smoothing Reactor:

- SL cover should be opened during every IC and blowing of SL should be done for removal of dust and dirt.
- All the cable connections of SL should be thoroughly checked and proper tightening ensured during IC inspection and during AOH of locomotive by sheds.

Relays:

- Continuity of QLM circuits from TFILM to QLM should be checked during every IA, IB, IC inspection or whenever center hood of loco motive is removed for maintenance purposes.
- Ensure that rating of CCPT fuse has been reduced to 10 amps from 16 amps.
- Ensure implementation of Modification Sheet No. RDSO/2009/EUMS/0383(Rev'0')- Oct, 2009 on provision of LED indication near Q-50 relay for indicating status of C-145 contactor.

Fire Preventive Measures in 3-Phase Locomotives

- Mechanical inter locking arrangement to be provided for primary over current relay (Modification sheet No. 420, dt 23/01/2013).
- The working of primary over current relay should be checked in every minor schedule and the same calibrated in every major schedule.
- The signs of oil leakages from pipe lines, conservator and bushings of transformer as well as traction converter should be checked in every minor schedule and the same attended. Signs of any oil spillage/accumulation at the top of transformer plate should be observed during every schedule by opening the front inspection covers of the converter and the same got cleaned/attended.
- DC link capacitors & Resonant circuit capacitors of power converter should be visually examined for any signs of oil leakage/abnormality in all minor/major schedules. The capacitance values of these capacitors should be measured in every major schedule.
- Filter Cubicle capacitors should be visually examined for any signs of oil leakages in every Minor/Major schedule. The capacitance values of these capacitors should be measured in every major schedule.
- DC link capacitors of Auxiliary converters should be visually examined for any signs of oil leakages in every minor schedule.
- The capacitance value of these capacitors should be measured in every Major schedule.
- The capacitance of individual DC link as well as resonant capacitor should be recorded in every second MOH. In case of deterioration of capacitance, necessary action for their replacement should be taken.
- Working of FDU to be ensured in all locos in every schedule.
- FDU pipelines to be blown with air pressure during major schedules.
- Care should be taken during replacement/attention of valve sets that any leakage of oil from hoses/valve set tank is avoided as all such oil accumulates on the top of transformer plate and is a potential fire hazard.
- The HV (Micafil) bushing provided on the roof of 3 phase electric locomotives should be maintained as per guidelines issued by RDSO vide their letter No. EL/3.2.21/1, dt. 12/10/12.
- A cyclic check of Tan delta measurement of Micafil bushing has been started, the same has to be completed. Further, this will be continued during MOH after completion of one cycle in all locos.
- In addition to the above, CO₂ fire extinguishers should be checked for availability of gas before the dispatch of the locomotives. In 22.5 Kg cylinders pressure of the gas should be recorded and in 5 Kg cylinders weight of the gas should be recorded.

Important instructions to the crew:

- Whenever the VCB trips while hauling a train with 3-phase electric locomotives, the LP & ALP should immediately check/read the DDS message carefully on the display screen of computer in the cab for the associated fault.
- In case the VCB has tripped through primary Over Current Relay with Priority 1 fault message the Loco Pilot/ Assistant
- Loco Pilot (LP/ALP) should immediately inspect the Machine Room carefully looking for any signs of fire/smoke, spread/ spillage of oil especially near converter/ transformer area and extinguish the same by using portable fire extinguisher.
- Primary Over Current Relay in 3-phase electric locomotives is just like QLM relay in conventional electric locomotives and its operation should attract attention of the running staff in the same manner as for QLM relay.

- In case of larger fire specially over traction converter and transformer area the cocks of 22.5 kg CO2 cylinder provided in the locker on ALP side should be operated in both the cabs, keeping the Machine Room door in dosed condition.
- If no signs of fire/smoke are observed LP should close the VCB only once more. If the same trips again with Over Current Relay the control electronics will be automatically switched off and panto lowered by software. The LP/ALP should not try to switch ON the control electronics or close VCB again and they should immediately ask for assistance from TLC.
- Any case of fire/smoke message from Fire Detection Unit(FDU) appearing on display screen with/without tripping of VCB should not be ignored and crew should inspect the machine room thoroughly and look for any signs of smoke/fire/overheating/spark from equipment/joints and take further action accordingly.
- It should be ensured that the LP & ALP running 3-phase electric locomotives are fully conversant with the display messages of fault available in the display screen of the computer. Refreshers Courses should be arranged for new LPs/ ALPs at shorter intervals initially and later on based on this experience, this may be increased. The importance of Priority 1 and Priority 2 faults and their consequences should be explained to them.

No. 2004/M (L)/466/7101/ Vol. III

New Delhi, dt. 01.10.2015

Chief Mechanical Engineers,
All Indian Railways, DLW and DMW.

Sub: Fire prevention measures on Diesel Locomotives.

Ref.: (i) Board's letter No. 2004/M(L)/466/7101 dated 08.07.2005.
(ii) Board's letter No. 2004/M(L)/466/7101 Vol. III dated 08.07.2005

There have been incidences of locomotive fires off and on causing avoidable detention to trains and loss of money and image. Recently there was a fire case on Northern Railway on 02.07.2015, wherein it was found that the fire started from the under frame in the TM-3 cable due to excessive heating. Instructions were issued on measures against fire vide letter referred above.

In this regard, all Zonal Railways and PUs are advised to ensure for the following:

- (a) No leakage of lube oil and fuel oil.
- (b) Fuel cross over pipe is properly secured and is not rubbing with engine block.
- (c) Compressor inter cooler pipes are dry and oil of the oil bath filters does not fall on the pipes.
- (d) Engine room must be maintained oil free and no foreign material like cotton waste, etc are lying there.
- (e) The electrical cables should be adequately protected, covered from leaking diesel oil, which could spill on these cables.
- (f) Oil spillage from diesel engine into the alternator/ generator room to be prevented
- (g) Leakage of oil through partition plate and from crank case exhaust pipe shall be checked.
- (h) IR values of power and control cables shall be checked
- (i) To avoid sparks, wiring at junctions/ interfaces should be should be tightened properly. Sealing at terminal box to be checked and dust particles shall be cleaned periodically.

- (j) Carbon brush condition, brush spring pressure, freeness of carbon brush, arcing horn gap and commutator surface cleanliness shall be checked periodically.
- (k) Milli volt drop shall be checked across the WSR with traction motors in series and parallel conditions.
- (l) To prevent oil entry into the traction alternator connection box, adequate sealing arrangement should be maintained.
- (m) Power and Control cables shall be converted to e-beam irradiated type during POH/Rebuilding as per the extent instructions.
- (n) Instructions were issued, vide letter referred (ii) above to Zonal Railways for provision of thermal insulation on exhaust manifold for fire prevention on diesel locomotives. It must be ensured that thermal insulation is provided on exhaust manifold and compressor intercooler pipes.
- (o) Prescribed type and number of fire extinguishers should be provided on each locomotive and loco crew are trained to operate these when required.

In addition to the above, maintenance instructions issued by RDSO, DLW and Zonal Railways for prevention of fire on Diesel Locomotives should also be followed religiously.

A. SMIL
1.10.15
(Vivek Kumar)
Exec. Dir. Mech. Engg. (Tr.)
Railway Board

Copy to: - ED (MP), RDSO, Lucknow.