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East Central Railway

Signal & Telecommunication Department

TECHNICAL CIRCULAR NO. – 17

Sub: Reliability of Plug in Type relays.

Ref: RDSO L.No.- STS/E/Relays/Genl.Misc, Dated-05.06.08 & 29.04.09

1. To improve the performance of plug-in-type relays (Metal to Carbon), the following important aspects must be ensured meticulously-

1.1 Maximum number of contacts proved in a given circuit using Metal to Carbon relays (other than 24V, 1000 ohm relay) shall be restricted to 45. (Para 21.4.1 (f) of SEM Part-II).

1.2 Proper storage of relays is essential and has been covered under para 19.50 of SEM Part-II. It should be ensured that such a storage place is not in vicinity of damp or chemically polluted environment.

1.3 It shall be ensured that as far as practicable, the relay room is not located in the vicinity of chemical factory, loco shed or engine ash pits etc. In case it becomes unavoidable, necessary precautions shall be taken so that relays are least affected by the chemical fumes, dust etc. and are provided with dust-free environment. Where there is concentration of relays, air conditioning shall preferably be provided. (Para 19.53 of SEM Part-II)

1.4 Where Relay can not be located in the cabin, they shall be housed in location of approved type which are properly secured. (Para-19.54 of SEM Part-II)

1.5 The transportation is generally carried out by Rail Transport where the possibility of mishandling is much higher than the transportation carried by road. Since relays are delicate electro mechanical safety equipment, it is necessary that utmost care is taken in handling of the same. To avoid/minimize damage to signaling relays in transportation, it is suggested that while indenting relays, a specific mention may be made for transportation to be "BY ROAD" only. Provision of careful transportation of relays from place of storage to the work site is already exists in SEM Part-II Para 19.52.

1.6 There may be considerable time lag between the fitment of plug board and plugging of the relays before final testing due to which the relay once unpacked around without protection. Thus, relays shall be removed from packing only when other related activities have been completed.

1.7 The personnel (Railway/contractor staff) doing soldering of plug board connectors/associated wiring shall be trained in proper soldering practices and for signaling works soldering done only by temperature controlled soldering iron (Technical Circular No.- 04/2007, dated- 21.08.07)

1.8 Relays which are stored for more than three years should be flashed before use. For flashing relays following procedure may be adopted-

1.8 (a) Firstly Relays will be connected with 24 V D.C source & energized.

1.8 (b) Secondly 2 Amp current will be passed 3 or more times through every pick up contact. For this purpose SL-17 Signal Lamp will be used in Conjunction with a switching device & 12 V AC/DC power supply.

1.8 (c) Similarly 2 Amp current will be passed 3 or more times through every drop contact.

1.8 (d) The testing also be done at minimum pick up voltage and 120 mA current will be passed through the contact and output current may be measured ti observe the contact resistance. 120 mA source is available with Relay testing kit.

1.9 During periodical inspection, visual inspection of relays should be carried out (as per Para 19.140 of SEM Part-II) for any defect in respect of movement of armature and contact carriage, arcing of condition, pitting or charring of contacts, dust accumulation on contacts, electro plating, corrosion, rusting of components, crack charring of cover near contacts in the case of plug in type relays, corrosion of label, absence or tempering of seal, any other abnormal condition.

1.10 The relay that is in any way defective should be changed at once. On no account should any attempt be made by line staff to rectify the relay.

1.11 All relay clips shall be checked for proper locking in the base when plugged in. extreme care shall be exercised while removing the clips from the jacks of the plug in type relay.

1.12 It shall be ensured that all relays are sealed.

1.13 Line relays shall be energized at the rated voltage specified in the specification. In no case voltage of relay terminal shall be less that 22 V for 24 V relays.

1.14 Relays are supplied along with base. It should be installed with own base only. By drilling of hole locking pin code must not be changed.

2.0 Before inserting the relays into the plug board all relays shall be tested with Relay Testing kit. Testing kit shall be procured from RDSO approved manufactured. This test must be done preferably jointly with open line.

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3.0 Voltage drop from bus bar to relay terminal shall not be more than 2 Volt.

4.0 To eliminate the failures on account of Relay Contact missing or offering high resistance, following action is required to be taken for each relay-

4.1 Each relay to be taken out and the Relay base and back side contacts of the relay should be examined and cleaned to remove dust.

4.2 Proper locking of the contact clip in the relay base to be ensured.

4.3 Dry solder in contact clips, if any, to be identified and proper soldering to be done. After doing this relay should replaced and retaining clip fixed ensuring the relay is held without any slackness.

These issues with the approval of CSTE

13/10/2009

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for General Manager(S&T)

No. - ECR/S&T/Tech.Circular/185 Date: 13.10.2009

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