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सत्यमेव जयते

भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India - Ministry of Railways
Research, Designs & Standards Organization, LUCKNOW - 226011

No.EL/11.5.5/1 Dated : 28.07.2008

Chief Electrical Engineer,

- Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB)
- Central Railway, 2nd floor, Parcel Office Building, Mumbai CST-400 001
- Northern Railway, Baroda House, New Delhi-110 001
- East Central Railway, HQs Office, Hajipur-844 101(Bihar)
- South Central Railway, Rail Nilayam, Secunderabad-500 071

Modification Sheet No. RDSO/2008/EL/MS/0365 (Rev.'0') Dtd.28.07.2008

1.0 Title: Improved Grounding of ALG Rack in Traction Converter of three phase electric locomotives.

2.0 Object: Grounding of ALG rack is very important to reduce EMI effects / interferences. The EMI interference results sometimes in misfire of GTO (i.e. shoot through failures). With the implementation of improved shielding / grounding techniques, shoot through failures of valve sets shall be arrested.

3.0 Existing Arrangement: The existing grounding system of ALG rack consists of two 2.5 sq.mm cables from ALG rack to ALG housing body, which in turn is mounted on converter body. Converter body is earthed with a separate earthing cable. Thus the ALG rack is not connected directly to earth resulting in to inadequate ground termination of ALG rack and subsequent possibility of EMI interference. EMI effect is not fully neutralized as existing grounding is through various fixtures of ALG rack and converter body introducing high resistance path.

4.0 Modified Arrangement: To improve the grounding termination, direct grounding from ALG rack to earth terminal of converter body is to be provided. For this, an additional earthing cable from ALG rack to converter body earthing terminal has to be provided using 4GKW, 6 sq.mm cable. The cable should be routed along the existing cables and shall be terminated at the converter earthing terminal where the main earthing cable is terminated. Modification should be carried out as shown in **Annexure I, II & III (enclosed).**

5.0 Application to Class of Locomotives: WAP5, WAP7, WAG9 & WAG9H three phase electric locomotives.

6.0 Material Required (per converter):

i) 4 GKW, 6 sq.mm Cable approx. 2.5 m long = 01 No.;
ii) Lug 6 sq.mm, 6 mm dia (ALG rack side) = 01 No. &
iii) Lug 6 sq.mm, 10 mm dia (Converter body side) = 01 No.

7.0 Material rendered surplus: Nil

8.0 Reference: Nil.

9.0 Modified Drawings: Photographs in Annexure-1, 2 and 3 are enclosed.

10.0 Agency of Implementation: CLW and Electric Loco Sheds holding 3-phase electric locomotives.

11.0 Periodicity of Implementation: During Minor & Major Schedules.

20/07

(Sandeep Srivastava)
for Director General (Elect.)

Encl: As above.

Copy to:-

1. Secretary (Electric Traction), Railway Board, Rail Bhavan, New Delhi – 110 001

2. Chief Electrical Loco Engineer,
   - Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB)
   - East Central Railway, Hajipur-844 101(Bihar)
   - Northern Railway, Baroda House, New Delhi-110 001
   - Central Railway, HQ Office, 2nd floor, Parcel Office Bldg., Mumbai CST- 1
   - South Central Railway, Rail Nilayam, Secunderabad - 500 071
   - West Central Railway, Jabalpur- 482001
   - South East Central Railway, Bilaspur-495004

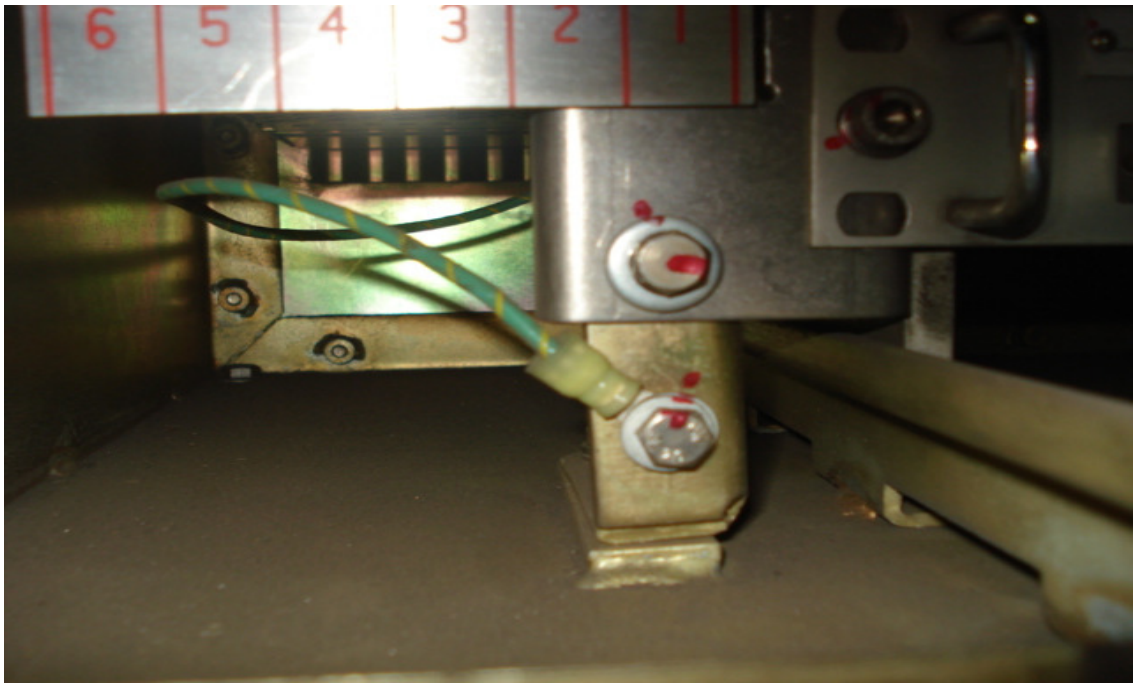
3. Sr. DEE (TRS), Electric Loco Sheds,
   - East Central Railway, Gomoh-828401
   - Northern Railway, Ghaziabad (UP)- 201001
   - Central Railway, Ajni (Nagpur)-440008
   - South Central Railway, Lallaguda, Secunderabad – 500 071
   - West Central Railway, Tuglakabad, New Delhi
   - South East Central Railway, Durg, Bhilai

20/07

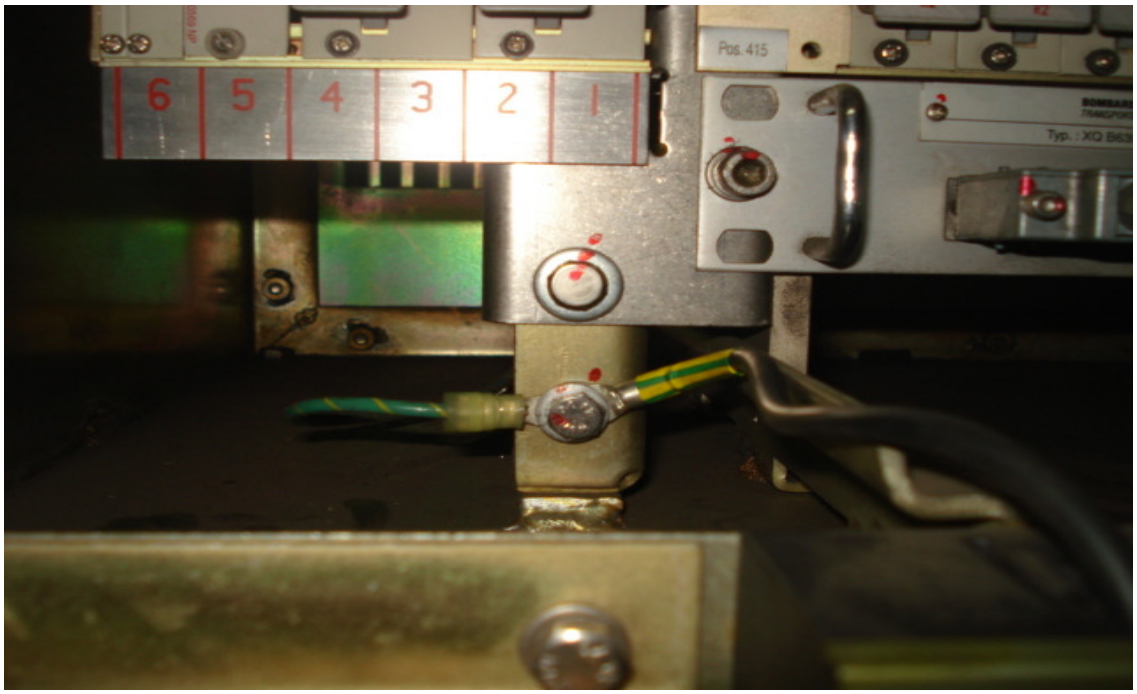
(Sandeep Srivastava)
for Director General (Elect.)

Encl: As above.

Annexure-I



(ALG Rack Existing Arrangement)



(ALG Rack-Modified Arrangement)

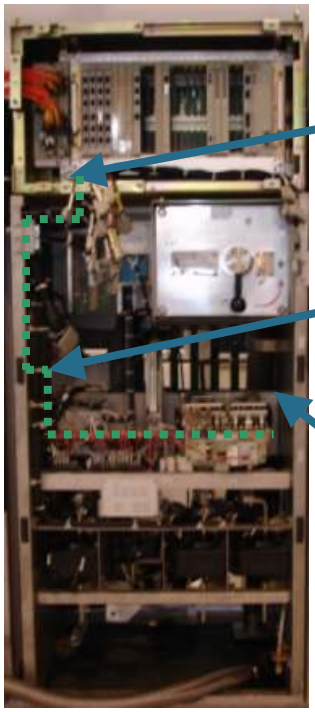
Annexure-II

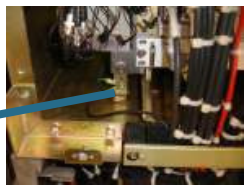
(SR Earthing- Existing Arrangement)

(SR Earthing-Modified Arrangement)

Annexure-III

Improvement in ground termination of ALG:





Ground termination of ALG Rack

Ground termination of ALG Rack connected with the DC Link voltage sensor ground

From the top of the DC link voltage sensor, it is connected to the earthing of main converter (back side)