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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/ 3.1.35/2/Elect.

Date 05.12.2019

### 1 प्रधान मुख्य विद्युत अभियंता

- i. मध्य रेलवे, मुख्यालय, दूतीयताल, पार्सल कार्यालय, मुम्बई - सी. एस. टी. - 400 001
- ii. पूर्व मध्य रेलवे, हाजीपुर (बिहार) - 844101
- iii. पूर्व रेलवे, फेयरली पैलेस, कोलकाता - 700001
- iv. पूर्व तटीय रेलवे, रेलवे कॉम्प्लेक्स, भुवनेश्वर - 751023
- v. उत्तर रेलवे, बड़ोदा हाउस, नई दिल्ली - 110001
- vi. उत्तर मध्य रेलवे, ईलाहाबाद - 211001
- vii. दक्षिण पूर्व मध्य रेलवे, बिलासपुर - 495004
- viii. दक्षिण मध्य रेलवे, प्रधान कार्यालय, रेल नीलायम, सिकंदराबाद - 500071
- ix. दक्षिण पूर्व रेलवे, गार्डन रीच, कोलकाता - 700043
- x. दक्षिण रेलवे, पार्क टाउन, चेन्नई - 600003
- xi. पश्चिम मध्य रेलवे, जबलपुर - 482001
- xii. पश्चिम रेलवे, चर्चगेट, मुम्बई - 400020
- xiii. चित्तरंजन लोकोमोटिव वर्क्स, चित्तरंजन, पश्चिम बंगाल - 713331

विषय : Modification in earth fault circuit for elimination of spurious messages on account of earthing of control cable in 3-phase locomotives.

उपरोक्त विषय में इस कार्यालय का दिनांक 05.12.2019 का समसंख्यक पत्र आपकी सूचना एवं आवश्यक कार्यवाही हेतु इस पत्र के साथ संलग्न है।

21/12/19

(राजेश कुमार)

उपनिदेशक मानक विद्युत  
कृते महानिदेशक/ विद्युत

संलग्नक यथोक्त :

### प्रतिलिपि

1. सचिव (चल स्टॉक /विद्युत अभियांत्रिकी), रेलवे बोर्ड, रेल भवन, नई दिल्ली -110001.
2. Sr. Divisional Electrical Engineer (TRS)/Electric Loco Shed,  
वरिष्ठ मंडल विद्युत अभियंता/टीआरएस/ विद्युत लोको शेड

1. Eastern Railway, Howrah-711 311. पूर्व रेलवे, हावड़ा-711 311.
2. East Coast Railway, Vishakhapatnam. पूर्व तटीय रेलवे, विशाखापत्तनम-530 001.

3. East Coast Railway, Barauni Junction, Begusarai (Bihar)-851116. पूर्व तटीय रेलवे, बरौनी जंक्शन बेगुसराई (बिहार) - 851116.
4. East Central Railway, Gomoh. पूर्व मध्य रेलवे, गोमो-828 401.
5. North Centre Railway, Fazalganj, Kanpur. उत्तर मध्य रेलवे, फजलगंज, कानपुर-208 003.
6. Northern Railway, Ghaziabad. उत्तर रेलवे, गाजियाबाद-201 001.
7. Northern Railway, Ludhiyana (Panjab) उत्तर रेलवे, लुधियाना (पंजाब)
8. West Centre Railway, Tuglakabad, New Delhi. पश्चिम मध्य रेलवे, तुकलकाबाद, नई दिल्ली-110 044.
9. West Centre Railway, New Katni Junction, Katni (M.P.) पश्चिम मध्य रेलवे, न्यू कटनी जंक्शन, कटनी म.प्र.।
10. Western Railway, Vadodara-390 002. पश्चिम रेलवे, वडोदरा-390 002.
11. Central Railway, Bhusaval-425 201. मध्य रेलवे, भुसावल (महाराष्ट्र)-425 201.
12. Central Railway, Ajni, Nagpur-440 -008. मध्य रेलवे, अजनी, नागपुर (महाराष्ट्र)-440 008.
13. Central Railway, Kalyan (Maharashtra) मध्य रेलवे, कल्याण (महाराष्ट्र)
14. South Central Railway, Lallaguda, Secunderabad-520 017. दक्षिण मध्य रेलवे, लालागुडा, सिकंदराबाद-500 017.
15. South Central Railway, Kazipet, Warrangal-506 003. दक्षिण मध्य रेलवे, काजीपेट, वरंगल-506 003.
16. South Eastern Railway, Tatanagar-831 002. दक्षिण पूर्व रेलवे, टाटानगर-831 002.
17. South Eastern Railway, Santraghanchi, Howrah-711 311. दक्षिण पूर्व रेलवे, सांत्रागाची, हावडा-711 311.
18. South Eastern Railway, Bondamunda, Rourkela-770 032. दक्षिण पूर्व रेलवे, बंडामुंडा, राउरकेला-770 032.
19. South Eastern Railway, Rourkela-770 032. दक्षिण पूर्व रेलवे, डीजल शेड रोड, राउरकेला-769011.
20. South East Centre Railway, BMY Complex, Bhilai, Durg. दक्षिण पूर्व मध्य रेलवे, वीएमवाई कॉम्प्लेक्स, भिलाई दुर्ग-490 025.
21. Southern Railway, Raipuram, Chennai. दक्षिण रेलवे, रायपुरम, चेन्नई
22. Southern Railway, Erode-638 002. दक्षिण रेलवे, ईरोड-638 002.

राजेश 05.12.19

(राजेश कुमार)

उपनिदेशक मानक विद्युत

कृते महानिदेशक/ विद्युत

संलग्नक यथोक्त :

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Government of India - Ministry of Railways  
Research, Designs & Standards Organization,  
LUCKNOW - 226011

No. EL/3.1.35/2/Elect

Dated: 05/12/2019

Principal Chief Electrical Engineers;

- Central Railway, HQs Office, 2<sup>nd</sup> floor, Parcel Office Bldg., Mumbai-400 001
- East Central Railway, Hajipur (Bihar)-844 101
- Eastern Railway, Fairlie Place, Kolkata - 700 001
- East Coast Railway, Railway Complex, Bhuvneshwar - 751 023
- Northern Railway, Baroda House, New Delhi-110 001
- North Central Railway, Allahabad - 211 001
- South East Central Railway, Bilaspur-495 004
- South Central Railway, HQs Office, Rail Nilayam, Secunderabad-500 071
- South Eastern Railway, Garden Reach, Kolkata- 700 043
- Southern Railway, Park Town, Chennai - 600 003
- West Central Railway, HQs Office, Opp. Indira Market, Jabalpur-482 001
- Western Railway, Church gate, Mumbai - 4000 020
- Chittaranjan Locomotive Works, Chittaranjan-713 331 (WB)

**Sub:** Modification in earth fault circuit for elimination of spurious messages on account of earthing of control cables in 3-phase locomotives.

**Ref:** MOM of 39<sup>th</sup> MSG

As discussed in 39<sup>th</sup> MSG meeting for item no. 16 in order to eliminate spurious messages due to earthing of control cables in 3-phase locomotives, modification has been done in earth fault circuit and modification sheet no. **RDSO/2019/EL/MS/0480, (Rev.0)** is being issued by RDSO. This modification will be implemented in 10 nos WAG9/WAG9H locomotives in each shed having 3 phase freight locomotives. The performance of modification will monitored by railways and feedback to be submitted to RDSO for further consideration.

Encl: Modification Sheet

(Jitendra Yadav)  
for Director General (Elect.)

Copy to:

1. Secretary (Electrical traction), Railway Board, Rail Bhawan New Delhi-110001	For kind inf. please
2. Sr.DEE/TRS/ELs (As per standard mailing list).	For inf. and necessary action please

Encl: Modification Sheet

(Jitendra Yadav)  
for Director General (Elect.)





No. EL/3.1.35/2/ (Elect)

Dated: 05/12/2019

**Principal Chief Electrical Engineers;**

- Central Railway, HQs Office, 2<sup>nd</sup> floor, Parcel Office Bldg., Mumbai-400 001
- East Central Railway, Hajipur (Bihar)-844 101
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- South East Central Railway, Bilaspur-495 004
- South Central Railway, HQs Office, Rail Nilayam, Secunderabad-500 071
- South Eastern Railway, Garden Reach, Kolkata- 700 043
- Southern Railway, Park Town, Chennai – 600 003
- West Central Railway, HQs Office, Opp. Indira Market, Jabalpur-482 001
- Western Railway, Church gate, Mumbai – 4000 020

**Modification Sheet No. RDSO/2019/EL/MS/0480, (Rev.0)**

**1.0 Title:**

**Modification in earth fault circuit for elimination of spurious messages on account of earthling of control cables in 3-phase locomotives.**

**2.0 Object:**

There are many cases of intermittent failures of three phase locomotives on account of earth fault and later being concluded as checked found normal. Such as:

- a. In locos equipped with E-70 brake system, any earth fault on cables 2111A & 2111B causes "Brake Electronics Fail". Out of two cables 2111A & 2111B if one cable gets feed due to energisation of the respective cab and the second cable gets feed due to earth fault, leads to "Brake Electronics Fail" message.
- b. Similarly lot of spurious messages like VCB STUCK ON, 8.1/8 CONTACTOR STUCK ON can cause main power off due to any leakage voltage on account of earth fault in the cables causing signal status high read by card. Card will consider any voltage on input cable greater than 38V as status high. Recently, 10 Nos. of M/s AAL make couplers and 03 nos. SCB make couplers have flashed in three phase locos of ELS/LGD leading to on line loco failures on account of spurious message caused by leakage earthling of control cables current.

This issue was discussed during 39<sup>th</sup> MSG meeting (Item No. 16). It was unanimous decided to modify the circuit to eliminate the problem of spurious messages due to control cable earth fault.

**3.0 Existing Arrangement:**

At present the locomotive battery earth fault detection circuit has two centre points' earthed R-R resistors and this causes a potential of 48V on any cable after touching to ground. The scheme is placed at Fig-1



Now by changing the resistors to  $2R-R$  or  $R-R/2$  instead of  $R-R$ , the rise of potential in the event of earth fault can be reduced to 35V which is not considered as signal high by the card and spurious failures on account of earth fault can be avoided. The modified circuit is placed at Fig-2 and in image of modified arrangement of EFR is shown below:



