



सत्यमेव जयते



No. RDSO-TI0LKO(PSI)/39/2021-O/o PED/TI/RDSO

Date: As signed

1. Central Railway, Station Building, Mumbai CST – 400 001.
2. Eastern Railway, Fairlie Place, Kolkata-700 001.
3. East Central Railway, Hajipur-844 101.
4. East Coast Railway, Bhubaneshwar-751 023
5. Northern Railway, Baroda House, New Delhi - 110 001.
6. North Central Railway, Allahabad-211 001.
7. North Eastern Railway, Gorakhpur-220 055.
8. North Frontier Railway, Mailgaon - 781 011.
9. North Western Railway, Jaipur – 302 017.
10. Southern Railway, Park Town, Chennai- 600 003.
11. South Central Railway, Railnilayam, Secunderabad-500 371.
12. South Eastern Railway, Garden Reach, Kolkata-700 043.
13. South East Central Railway, Bilaspur-495 004.
14. South Western Railway, DRM's Office, Hubli-580 028.
15. Western Railway, Churchgate, Mumbai-400 020.
16. West Central Railway, Jabalpur- 482 001.
17. Konkan Railway Corporation Ltd, Belapur Bhavan, Sector-11, CBD-Belapur, Navi Mumbai, Maharastra-400 614.

Sub: Regarding Revision of Maintenance Instructions for Provision of Disconnector Assembly to the Lightening Arresters.

The frequent problems being faced due to present arrangement of Disconnector Assembly connected to the 42kV Lightening Arresters, have been reported by various Zonal Railways.

In view of the above, the 'Maintenance Instructions for Provision of Disconnector Assembly to the Lightening Arresters provided over 25 kV side of traction system' has been revised after considering feedback/suggestions from Zonal Railways. The copy of revised Instruction No. TI/MI/0048 Rev.02 is attached herewith for your information and further Necessary action, please.

यह सक्षम प्राधिकारी के अनुमोदन से जारी किया जाता है।

Digitally Signed by

Jitendra Kumar

Date: 22-03-2023 11:10:35

Reason: Approved

(जितेन्द्र कुमार)

निदेशक/क.सं.-3

कृते महानिदेशक/(क.सं.)

संलग्नक: As stated above

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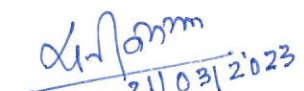
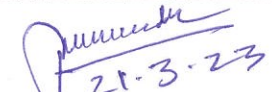
सत्यमेव जयते

भारत सरकार / Government of India

रेल मंत्रालय / Ministry of Railways

निर्देश संख्या टी आई/एम आई/0048 संशोधन 02
MAINTENANCE INSTRUCTION NO. TI/MI/0048 Rev.02

**Maintenance Instructions
for
Provision of Disconnecter Assembly to the Lightning Arresters
provided over 25 kV side of traction system on Indian Railways**

		हस्ताक्षर/Signature
अनुमोदित Approved by	प्रधान कार्यकारी निदेशक (पी एस व ई एम यू) Principal Executive Director /PS & EMU	 21/03/2023
अनुशंसित Recommended by	कार्यकारी निदेशक (कर्षण संस्थापन) Executive Director (TI)	 21-3-23

जारीकर्ता Issued by:

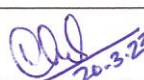
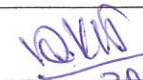
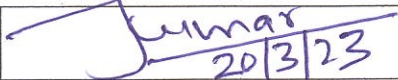
कर्षण संस्थापन निदेशालय, Traction Installation Directorate

अनुसंधान अभिकल्प एवं मानक संगठन RESEARCH DESIGNS & STANDARDS ORGANISATION

मानक नगर MANAK NAGAR

लखनऊ LUCKNOW – 226 011

(केवल आधिकारिक प्रयोग के लिए For official use only)

	 20-3-23	 20-03-2023	 20/3/23
Prepared By	SSE(D-TR)	Checked By	ADE/TI-3
		Issued By	Dir/TI-3

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1.0 This MI superseded the earlier SMI no. TI/MI/0048 Rev.01 27.07.2021.

2.0 Scope:

The technical instructions compiled in this document are related to the installation/provision of disconnecter assembly to the LA provided over 25 kV side of traction system of Indian Railways.

3.0 Objectives:

This disconnecter is to be installed with LA provided at switching stations with a view to:

- i. Provide tell-tale sign of failure and also
- ii. Disconnect failed LA from OHE, thereby ensuring that tripping of the line does not occur and the system remains live.

4.0 Abbreviation

LA	– Lightening Arresters
kV	– Kilovolt
OHE	– Over Head Equipment
SMI	- Special Maintenance Instruction
PCD	- Pitch Center Dia

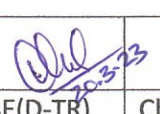
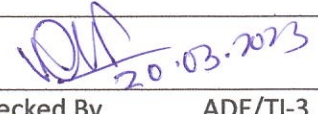
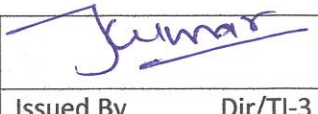
5.0 Background:

5.1 In the event of failure of LA on line if not accompanied by shattering of the hollow insulator, the line does not hold till failed LA is identified and physically isolated. This leads to serious traffic interruption. Hence a need is felt to install a Disconnecter which will disconnect the LA from OHE upon failure; thereby ensuring that the traffic interruption does not occur and also permitting much faster restoration. Also, this device will give tell-tale indication for visual identification of failed LA.

5.2 In the earlier MI No. TI/MI/0048 Rev.01 dated 27.07.2021; it was mentioned to provide the Disconnecter at the Top side of the LA. With this provision, failures were reported from Zonal Railways that even after operation of Disconnecter, the disconnected jumper wire, which is still charged at 25 kV due to connected to OHE, hanging in air. Sometime this hanging jumper came in contact with nearby Mast and trip the line. Thus, the purpose of providing the Disconnecter is not fulfilled. The issue was discussed with Railway Board and zonal railways in the monthly Failure analysis meeting and it was decided to revise the SMI for providing the Disconnecter to the Line side of jumper.

5.3 Disconnecter

Disconnecter, often used on medium-voltage arresters, provide a visual indication of a failed LA by disconnecting it from the system. Once the LA has failed, the current continues to flow through the Disconnecter, energizing a compound in the assembly, which ensures the Disconnecters breaks up and disconnects the connection of LA from OHE there by ensuring the line remains live. The disconnecter may be an integral part of the LA or a separate unit installed in series with the LA installed. The advantage is that the line remains in operation after disconnection of the LA.

					
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The Disconnecter assembly consists of Disconnectors & adaptor plate to connect the Disconnecter with 25kV Line.

6.0 Applicable standards for Disconnecter

This SMI is based on following standards, specifications and RDSO documents:

SN	Standard/reference	Subject
a.	IEC 60099- 4	Surge arresters – Part 4: Metal-oxide surge arresters without gaps for a.c. systems
b.	IEC 60099-5	Surge arresters-selection & application recommendation
c.	IS 3070 part-3	Lightning Arresters for Alternating Current Systems - Specification - Part 3: Metal Oxide Lightning Arresters without Gaps.
d.	IS 15086 part-3	Selection & application guide
e.	RDSO instructions TI/MI/0041	Maintenance instructions for Lightning Arresters
f.	RDSO Specification no. TI/SPC/PSI/MOGTLA/0101 (02/2015)	Specification for Metal Oxide Gapless Type Lightning Arrester for use on Railway Traction Sub Station and Switching Stations

7.0 PROCEDURE

i. Initial Inspection:

The Dis-connector and its associated components should be carefully inspected for physical damage of any kind. If any damage is found, it should not be installed and energised. Prior to installing the Dis-connector assembly, it is to be ensured that the Disconnecter and its associated components are cleaned thoroughly using a soft cloth to wipe out any dust or other foreign particles present on the surface.

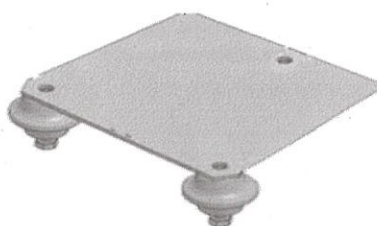
ii. Installation:

All electrical connections should be as short as possible but avoiding sharp bends and loops. Ensure that no excessive mechanical stress is applied to the Disconnecter through the connection. The ground connection should be made to a permanent and effective low resistance ground, preferably the main system ground, and interconnected with structure wherever possible.

iii. Base insulators are used to isolate the base end of the LA from ground.

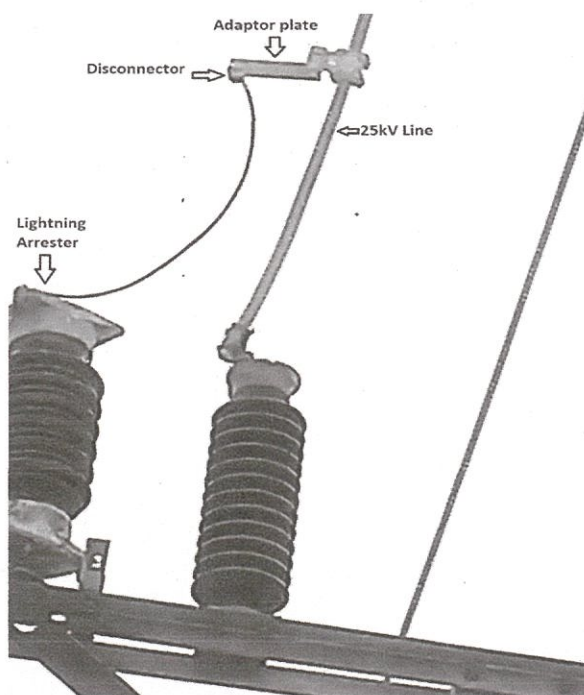
- Ensure that the mounting surface must be flat and level, so that the unit, when installed with base insulators, is standing true and vertical.
- Before start of installation, holes to be drilled on to the adaptor plate in order to match hole size & PCD of LA flange in use. Also holes to be drilled on to the top plate, of the existing structure in the substation to match to PCD of adaptor plate such that the base insulators can be secured on to the structure. Ensure that the holes drilled should be sprayed with "Zinc Galvanizing Spray Paint" to prevent rusting.
- Base insulators must be bolted directly to the adopter plate mounting surface. Typical diagram of the same is shown below. Max torque value for tightening shall be 50 Nm.

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- (d) LA is then assembled on top of the adaptor plate.
- (e) Connect the disconnector adaptor plate to the 25 kV side. Assemble Disconnector to this plate. The Jumper wire which is conventionally connected between LA top terminal and OHE, is now to be connected between Disconnector and top of the LA terminal. The maximum torque shall be 30 Nm. Note that applying excessive torque may lead to breakage of Disconnector. Torque wrench to be used to ensure usage of correct torque.
- (f) It must be ensured that the jumper from Disconnector to top terminal of LA should be of required length such that it should not touch any of the part after operation of the Disconnector.
- (g) The earth lead of the LA is to be connected form one of the bolts of bottom flange of LA to surge counter. Flexible insulated cable of 35 mm² is to be used as lead for earth connection. It is required to use lugs on both ends of lead for connection.

8.0 A Photographs of a Location where the Disconnector on Top side of LA has been provided in IR is as below for reference.



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