



सं./No: RDSO-TI0LKO(OHE)/2/2020-O/o PED/TI/RDSO

दिनांक/Date: 25.04.2023

Principal Chief Electrical Engineer,

1. Central Railway, 2nd floor, Electrical Branch, Parcel Office Bldg. Mumbai - 400 001.
2. Eastern Railway, Fairlie Place, Kolkata-700 001
3. East Central Railway, Hajipur (Bihar).844101
4. East Coast Railway, B-Rental Colony, Chandrashekharapur, Bhubaneshwar (Orissa)-751 023
5. Northern Railway, Baroda House, New Delhi - 110 001
6. North Central Railway, Block-A, Subedarganj, Allahabad 211 033.
7. North Eastern Railway, Gorakhpur (UP).220 055
8. Northeast Frontier Railway, Maligaon, Guwahati - 781011.
9. North Western Railway, Jaipur (Raj.) – 302017.
10. Southern Railway, Park Town, Chennai - 600 003 (TN)
11. South Central Railway, Rail Nilayam, Secunderabad – 500 371
12. South Eastern Railway, Garden Reach, Kolkata-700 043.
13. South East Central Railway, Bilaspur (Chhattisgarh).4950 04
14. South Western Railway, DRM's Office, Hubli (Karnataka)
15. Western Railway, Churchgate Stn. Bldg, Mumbai - 400 020.
16. West Central Railway, Jabalpur-482 001 (M.P)
17. Central Organisation for Railway Electrification, 1, Nawab Yusuf Road, Civil Lines, Prayagraj-211001.
18. Konkan Railway Corporation Limited, Belapur Bhavan, Plot No 6, Sector 11, CBD Belapur, Navi Mumbai – 400614.
19. Metro Railway, Kolkata, Metro Bhavan, 33/1, J L Nehru Road, Kolkata-700031.
20. Director General, IRIEEN, Post Box 233, Nashik Road-422101.
21. Chairman and Managing Director, IRCON, Room No. 505, Palika Bhawan, Sector -13, R. K. Puram, New Delhi-110066.
22. Managing Director, DFCCIL, 5th Floor, Pragati Maidan, Metro Station Building Complex, New delhi-110 001.
23. Chief Executive Officer, Railway Energy Management Co. Ltd, Ground Floor, Central Wing, Sector 29, Gurgaon-122001.
24. Director Technical, MRVC, 2nd Floor, Churchgate, Mumbai-400020.
25. ED (Electrical), RVNL, 1st Floor, August Kranti Bhavan 'B' Block, Bhika Ji Cama Place, R K Puram, New Delhi-110066.
26. Chairman and Managing Director, RITES LTD, Shikhar, Plot No.01, Sector 29, Gurgaon, Haryana, India-122001.

**विषय/Sub: Special Maintenance Instruction No. TI/MI/0042, Rev-01 for Testing of 25 kV
Porcelain & Composite Insulators before Installation.**

Special Maintenance Instruction No. TI/MI/0042, Rev-0 for Testing of 25 kV Porcelain & Composite Insulators before Installation was issued by RDSO in December, 2008. The same has been reviewed and revised as Special Maintenance Instruction No. TI/MI/0042, Rev-01. This supersedes the earlier issued Special Maintenance Instruction No. TI/MI/0042, Rev-0.

A copy of revised Special Maintenance Instruction No. TI/MI/0042, Rev-01 is enclosed herewith for reference and necessary action please.

This issues with the approval of competent authority.

संलग्नक: यथोक्त।

Digitally Signed by Arvind Kumar
(संलग्नक/क सं-1/ Director/TI-1
Date: 25-04-2023 17:36:01
कृते महानिदेशक/क सं-1/for Director General/TI
Reason: Approved

Copy to: Executive Director, EEM, Railway Board, Rail Bhavan, New Delhi- 110001
-for kind information please.



सत्यमेव जयते

भारत सरकार GOVERNMENT OF INDIA

रेल मंत्रालय MINISTRY OF RAILWAYS

स्थापना से पहले 25 केवी पोर्सिलेन और कम्पोजिट इंसुलेटर के परीक्षण के लिए विशेष रखरखाव निर्देश (एसएमआई)

SPECIAL MAINTENANCE INSTRUCTION (SMI) FOR TESTING OF 25 kV PORCELAIN & COMPOSITE INSULATORS BEFORE INSTALLATION

सं. टी0आई0/एमआई0/ 0042 (04/2023), संशोधन-01
No. TI/MI/ 0042 (04/2023), Rev-01

जारीकर्ता/ISSUED BY:

कर्षण संस्थापन निदेशालय;
TRACTION INSTALLATION DIRECTORATE,
अनुसन्धान अभिकल्प और मानक संगठन
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(केवल आधिकारिक प्रयोग के लिए/For official use only)

Prepared By	JE(D)/TI	Checked By	ADE/TI-1	Issued By	DTI-1
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SPECIAL MAINTENANCE INSTRUCTION (SMI) FOR TESTING OF 25 kV PORCELAIN & COMPOSITE INSULATORS BEFORE INSTALLATION

1. OBJECTIVE:

To specify testing procedure of 25kV solid core porcelain insulators and Composite Insulators at site/depot before installation. Testing of Insulators before Installation is necessary to identify the defective/damaged insulators which may have been developed due to various reasons beyond Railways control.

2. BACKGROUND:

To identify the insulators which may have developed defect due to various reasons beyond Railways control. Initially, Railways were advised vide SMI No. TI/MI/O011 'Rev 0' and subsequent Revision 1 to test each insulator for routine tensile load test at site/ depot before installation. Later, Pre-installation testing of Composite Insulator testing was also included in the scope of the SMI and to This SMI No. TI/MI/O011 was superseded vide SMI No. TI/MI/0042, Rev-0 in December, 2008.

3. NEED FOR REVISION:

In the previous revision of SMI No. TI/MI/0042, Rev-0, pre-installation test is mentioned for Stay, Bracket & 9-Tonne Insulator only. Railways have been reporting that failure of Sectioning Insulators during the Installation. Further, ECoR have also proposed vide letter No. ECoR/EL/TRD/446/32 dated 10.06.2022 to include other type of Insulators in the scope of Pre-installation testing vide RDSO's SMI. Accordingly, pre-installation test for other type of Insulators i.e Post, Section & Operating Rod Insulators have also been incorporated.

This SMI supersedes the earlier SMI No. TI/MI/0042 (12/2008), Rev-0

4. TESTING INSTRUCTIONS:

- 4.1 For conducting the routine tensile load test on 25 KV Porcelain & Composite Insulators before Installation, Tensile Load Testing Machine as per RDSO Specification No. TI/SPC/OHE/INSTEST/0090, Rev-0 (with A & C slip 1) or latest to be used. The load shall be as per the values mentioned in the Table-1 & Table-2 below:

Table-1: Load to be applied for testing of 25 kV Porcelain Insulators

Specification No.	Type of Insulator	Specified SML in kgf	Routine Tensile Load (RTL) @ 55% of specified value in kgf
TI/SPC/OHE/INS/0070 & TI/SPC/OHE/INS/0071	Stay Arm and Bracket	7000	3850
	9-Tonne	11000	6050
	Post	6000	3300
	Operating Rod	2200	1210
	Section	5000	2750

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Table-2: Load to be applied for testing of 25 kV Composite Insulators

Specification No.	Type of Insulator	Specified SML in kgf	Routine Tensile Load (RTL) @ 70 % of specified value in kgf
TI/SPC/OHE/INSCOM/1070, TI/SPC/OHE/INSCOM/1071,	Stay Arm and Bracket	7000	4900
TI/SPC/OHE/INSCOM/1071, Rev-01 & TI/SPC/OHE/INSCOM/1072	9-Tonne	11000	7700
	Section	5000	3500

Following shall also be insured before pre-installation testing of 25 kV Insulators.

- Calibration of Tensile Load Testing Machine shall be done annually.
- Suitable fixtures shall be used for testing of different types of Insulators i.e. Stay Insulator to be tested with fixture meant for Stay insulator testing and vice-versa.

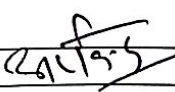
4.2 It would be seen from the above that RTL has been kept different in both type of insulator. The reason being:

- The porcelain insulator changes its mechanical characteristics at nearly 80% of its SML. There may be few insulators which may get manufactured with a reduced SML, say 80% its specified value. If such insulators are tested at 70% of specified SML, the resultant force shall be more than 80% of its actual SML, thus making a permanent change in the listed at porcelain & also make this insulator a suspect for failure in service due to development of stresses.
- In view of the above, IEC standards have been followed wherein no case, the RTL will exceed the limits which shall cause permanent set in the chemistry of the porcelain.
- For composite insulator, above reasoning does not apply. In these insulators, idea is to check the soundness of crimping of the metal ports with the fibre rod core and this force should be as near to the SML as possible. 70% of SML is considered to be as ideal force, hence specified.

4.3 TESTING PROCEDURE:

- Pre installation test shall be carried out on all type of Porcelain & Composite Insulators i.e. stay, bracket, 9- Tonne, Post, Operating Rod & Section insulators supplied by vendor/OHE contractor.
- Further, if insulators are to be erected from the available stock, they shall also be tested as per above values before installation.
- Ensure calibration of Tensile Testing Machine before beginning of the test with calibrated dynamometer.
- Make sure the fixture being used is of correct type as per Insulator being tested.
- Apply the routine tensile load as per Table-1 & Table-2 and maintain for one minute and then release.
- Check the insulators along with metal fittings for any cement crack, core pull out/ loose crimping, deformation in the metal fitting, hook etc. during the routine test.
- The defective insulator may be destroyed.

4.4 Insulators which have successfully withstood the specified RTL as indicated in the Table-1 & Table-2 shall only be commissioned in the OHE.

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