Sub: Implementation of guidelines issued regarding composite insulators for 25 kV Ac traction on Indian Railways.

(ii) RDSO’s letter no. TI/OHE/INS/GEN/13 dt. 19.06.2013.
(iii) RDSO letter no. TI/OHE/INS/COM/GEN dated 02.11.2019

Recently, there have been some cases of composite insulator failure over Indian Railways.

2. In this regard, guidelines were issued regarding provision of composite insulators vide letters under reference (i) & (ii) above, which are reiterated below:

I) (a) **For Equivalent Salt Deposit Density (ESDD) <= 0.3**
   (i) Use of only composite insulators of 1050mm CD for stone pelting menace areas with approval of PCEE.
   (ii) Use of porcelain insulators of 1050mm CD for other areas.

(b) **For ESDD > 0.3**
   Use of composite insulators of 1600mm CD in all the areas with the personal approval of PCEE after conducting the ESDD test as per RDSO SMI no. TI/MI/040, Rev (0).

II) Wherever ESDD cannot be measured as per RDSO SMI mentioned above, the general method to ascertain the severity of pollution on qualitative basis may be adopted following the directives of IEC 60815-1/2008. However, final decision to arrive at a conclusion for the above shall require the personal approval of PCEE of zonal railway.

3. RDSO had also issued instructions for cleaning of 25 kV composite insulators vide letter under ref (iii) above, which, inter-alia, states that composite insulators shall be cleaned with DRY SOFT COTTON CLOTH to remove the dust/pollution from the insulator. No water, detergents, any solvents and abrasive materials should be used for cleaning as use of such material leads to deterioration of electrical properties, thus causing failures.

4. Executing Agencies should ensure to strictly follow the provision of composite insulators as per guidelines mentioned in para 2 above. Zonal Railways should ensure that provision of composite insulators in their territorial jurisdiction is strictly as per para 2 above and also follow the maintenance instructions mentioned in para 3 above to avoid composite insulator failures.

Encl: Letters under reference.

Copy to: Sr. EDII/RDSO: For kind information & necessary action please.

(Sumit Garg)
Director Elect. Enng. (PS)
Sub: Comprehensive policy regarding insulators for 25 kV AC traction on Indian Railways.

Ref: 1. RDSO’s letter no. TI/OHE/INSCOM/SL/11/1 dated 04.01.2011.
2. RDSO’s letter No. TI/OHE/INS/GEN/12 dated 07.06.2012.
3. This Office of even number dated 13.04.2010.

In supersession of all previous policy guidelines on the subject, it has been decided to adopt the following policy for the use of 25 kV insulators on AC traction system based on Equivalent Salt Deposit Density (ESDD) test enumerated in RDSO’s SMI no. TI/MI/040, Rev (0) circulated vide RDSO’s letter no. TI/OHE/INSCOM/05 dated 05.04.2005 as an interim measure:

(a) For ESDD ≤ 0.3
   (i) Use of only composite insulators of 1050 mm CD for stone pelting menace areas with the approval of CEE as para(2) below
   (ii) Use of porcelain insulators of 1050 mm CD for other areas

(b) For ESDD > 0.3
   Use of composite insulators of 1600 mm CD in all the areas with the approval of CEE as para(3) below

2.0 Procurement of insulators for the areas as specified in para a(i) above shall be identified & cleared by Sr. DEE of the respective division with CEE’s approval.

3.0 Procurement of insulators for areas where ESDD is more than 0.3 as stated in para (b) above shall be personally approved by CEE of the zonal railways after conducting the ESDD test as per RDSO SMI mentioned above. Till such time 1600 mm CD composite insulators are developed, 1050 mm CD composite insulators are to be used in such areas.
4.0. In pursuance to Board's letter No.2006/RE/161/21 dtd 03.03.2005, RDSO advised CR, WR, SR & ECoR vide its letter no. TI/OHE/INSCOM/GTSL/05 dted. 17/19.05.2005 to procure 500 nos. of 1600 mm CD (31 mm per kV) composite insulators for conducting trials in highly polluted areas. CEEs of CR, WR, SR & ECoR are accordingly advised to expedite installation of these insulators, if not already provided, and inform such locations to RDSO who shall prescribe a schedule of monitoring during AMW/POH and prescribe special test for few selected locations to check degradation with respect to environmental impact.

5.0 This issues with the approval of Board (ML).

(Sushil Kumar)
Director Elect. Engg. (PS)
Railway Board

Copy to: Sr.ED/TI/RDSO – It is advised to rigorously pursue trials of 1600 mm CD composite insulators on priority in CR, WR, SR & ECoR and submit the report to Board’s office.
No.TT/OHE/INS/GEN/13

Dated, the 19th June, 2013

The Chief Electrical Engineer,

1. Central Railway, Station Building, Mumbai CST – 400 001.
2. Eastern Railway, Fairlie Place, Kolkata-700 001.
4. East Coast Railway, Bhubaneswar-751 023.
5. Northern Railway, Baroda House, New Delhi - 110 001.
8. Southern Railway, Park Town, Chennai- 600 003.
10. South Eastern Railway, Garden Reach, Kolkata-700 043.
11. South East Central Railway, Bilaspur-495 004.
13. Western Railway, Chuchgate, Mumbai-400 020.
14. West Central Railway, Jabalpur- 482 001.
15. North Frontier Railway, Mailgaon - 781 011
16. North Western Railway, Jaipur – 302 017

Sub:- Comprehensive Policy regarding use of 25kV Insulators.

ii) This office letter NoTI/OHE/INS/GEN/13. dated 05.03.2013.

Railway Board vide letter referred (iii) above, have issued the policy regarding use of Insulators for 25kV AC traction on Indian Railways.

RDSO vide this office letter referred (ii) above, have directed all zonal Railways that the Composite Insulators of 1600 mm creepage distance, shall be used, with the approval of Chief Electrical Engineer of zonal Railway, in the area where Equivalent Salt Deposit Density (ESDD) is greater than 0.3 mg/cm².

2. South Central Railway, vide letter reference (i) above have sought clarification regarding guideline/modalities that are to be followed for the provision of insulators in the new Sections, under electrification by CORE/RVNL.

3. It is to clarify that in Electrified territory or area under Electrification where Equivalent Salt Deposit Density (ESDD) cannot be measured as per
RDSO's Standard Maintenance Insulator No. TI/MI/040, the general method to ascertain the severity of pollution on qualitative basis may be adopted and area may be considered as 'very heavy polluted zone' if the conditions are as under, following the directives of IEC 60815-1/2008 (Page No.20):

i) The area directly subjected to sea-spray or dense saline fog,
ii) The area directly subjected to contaminants with high conductivity, or cement type dust with high density and with frequent wetting by fog or drizzle.
iii) The desert areas with fast accumulation of sand and salt, and regular condensation.

4. However, final decision to arrive at a conclusion, for the above shall require the personal approval of the Chief Electrical Engineer of zonal Railway.

5. Further, salient directives issued by Railway Board, vide letter under reference (iii), are reiterated for implementation:

(a) Use of Composite Insulators of 1050 mm creepage distance for stone pelting areas with CEE's approval even with ESDD \( \leq 0.3 \text{ mg/cm}^2 \).

(b) Use of Composite Insulators of 1600 mm creepage distance in all area with approval of CEE's for ESDD \( \geq 0.3 \text{ mg/cm}^2 \).

New Areas where ESDD cannot be measured then above referred guidelines of IEC: 60815-1/2008 may be followed.

The report on implementation of these guidelines and benefits accrued may please be sent to RDSO regularly.

(V.K. Upadhyaya)
Director /TI (OHE-E)
For Director General (TI).

Copy to:-

1. The Adviser (RE) (EEM), Railway Board, Rail Bhavan, New Delhi-110001 - for kind information.
2. The Executive Director (EEM), Railway Board, Rail Bhavan, New Delhi-11 0001 - for kind information.
3. The Executive Director, RVNL, August Kranti Bhavan, Bhikaji Cama place, New Delhi - for information and necessary action please.
4. The General Manager M/S IRCON, C-4 District Centre, Saket, New Delhi 110017 - for information and necessary action please.
The Principle Chief Electrical Engineer,

1. Central Railway, Station Building, Mumbai CST – 400 001.
2. Eastern Railway, Fairlie Place, Kolkata-700 001.
4. East Coast Railway, Bhubaneshwar-751 023
5. Northern Railway, Baroda House, New Delhi - 110 001.
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.
15. Western Railway, Chuchgate, Mumbai-400 020.
16. West Central Railway, Jabalpur- 482 001.

Sub: Instruction for cleaning of 25 kV Composite Insulators.

As discussed during 30th MSG, based on the meeting with manufacturers and feedback received from zonal Railways the Instruction No.TI/IN/0040 Rev. ‘0’ for cleaning of 25 kV Composite Insulators has been prepared and enclosed herewith for implementation.

(Arvind Koomar)
Joint Director/TI-1
For Director General/TI

End: As stated above.

Copy to:
The Secretary (Electrical), Railway Board, Rail Bhavan, New Delhi-110 001.
GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

Instruction for cleaning of 25 kV Composite Insulators
used in Indian Railways Traction system
No. TI/IN/0040 Rev. '0'

(November, 2019)

ISSUED BY

TRACTION INSTALLATION DIRECTORATE
RESEARCH DESIGNS AND STANDARDS ORGANISATION
MANAK NAGAR, LUCKNOW – 226011

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1.0 **Scope:**

This instruction covers the guidelines for cleaning of 25 kV Composite Insulators used in Indian Railways Traction System. By cleaning of Composite Insulator failure on account of external reason may be avoided.

This instruction has been prepared on the basis of comments/suggestions received from the manufactures of Composite Insulators and Zonal Railways.

2.0 **Objective:**

Composite insulator performs service in OHE system under significantly adverse condition like higher degree of surface contamination including open environmental stresses such as rain, fog/ mist, UV and humidity. Surface contamination adversely affects the electrical properties of Composite Insulators which stimulates external Flashover.

This Instruction will be helpful in avoiding external failure of Composite insulators on account of surface contamination.

3.0 **General Instruction:**

For cleaning of 25 kV Composite Insulators installed in polluted/heavily polluted area, following schedule shall be followed:

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<tr>
<th>SN.</th>
<th>Type of Insulator</th>
<th>Pollution level</th>
<th>Periodicity</th>
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<tr>
<td>1.</td>
<td>Stay Arm Insulator</td>
<td>Polluted Area/ Heavily Polluted Area</td>
<td>Once in a year</td>
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<td>2.</td>
<td>Bracket Tube</td>
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4.0 **Method:**

(i) Composite Insulator shall be cleaned with DRY SOFT COTTON CLOTH to remove the dust/pollution from the insulator.

(ii) No water, detergents, any solvents and abrasive materials should be used for cleaning as use of such material leads to deterioration of electrical properties thus causing failure.

5.0 **Precautions:**

Please note that purpose of cleaning of Composite Insulator is only removal of dust/pollutants or any other deposition that adversely affects the electrical properties of Composite Insulators hence Care should be taken that during dry cleaning, the insulator should not be rubbed excessively to make it bright.

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