Government of India
Department of Telecommunications
Telecommunication Engineering Centre
Gate No. 5, Khurshid Lal Bhawan, Janpath, New Delhi-110001.
Fixed Access (FA) Division

File No. 33-1/2023-FA/TEC Dated:29.09.2025

Subject: Revision of Test Guide of Standard for Generic Requirements (GR) "Lightning and Surge Protection of Telecom Sites" (Test guide No. TEC 66131:2024) - Inviting comments.

In exercise of the powers conferred by rule 5(2) of the Telecommunications (Framework to Notify Standards, Conformity Assessment and Certification) Rules 2025, a draft revision of Test Guide (TEC 66131:2025) corresponding to Standard of Generic Requirements (GR) on "Lightning and Surge Protection of Telecom Sites" (existing Test guide No. TEC 66131:2024) is enclosed herewith (Annexure-I) for stakeholder consultation. It is requested to go through the enclosed draft Standard for revision of Test Guide (draft Standard No. TEC 66131:2025) and offer your inputs/comments. The comments may please be furnished in the template sheet enclosed herewith as Annexure-II.

The comments/inputs may be furnished through email to adgfa-tec-dot@gov.in with copy to dirfa.tec@gov.in and ddgfla.tec@gov.in at the earliest and latest within **sixty days of the date of this reference** please.

Enclosures:
(i) Draft Revision of Test Guide for "Lightning & Surge Protection of Telecom Sites"(Annexure-I)
(ii) Attach Annexure-II, Template

----Sd----
(Deo Pratap)
AD (FA), TEC
Email:adgfa-tec-dot@gov.in

To,

All Manufacturer & Stakeholders

Copy to:
1. DDG (FA), TEC
2. AD (IT), TEC - with request for uploading on TEC Website

ANNEXURE-II

NAME……(OF MEMBER/MANUFACTURER)

Inputs/Comments/Suggestions on Draft Revision of Test Guide for "**Lightning and Surge Protection of Telecom Sites " (Test Guide No. TEC 66131:2024)**".

Clause No.	Clause Description	Modified/ New Clause	Justification

Annexure-I

अनंतिम टेस्ट गाइड
टीईसी ६६१३१: २०२५~~४~~

(सं: टीएसटीपी/ टीईसी/जीआर/एलएसपी-००१/०२.जून.२०१७को अधिक्रधित करता है)

PROVISIONAL TEST GUIDE

TEC 66131:2025~~4~~

(Supersedes No. TSTP/TEC/GR/TX/LSP - 001/02/JUNE.2017)

for

लाइटिनिंग एंड सर्ज प्रोटेक्शन ऑफ टेलीकॉम साइट्स

~~लाइतटतनंग एंड सर्ज प्रोटेक्शन ऑफ टेलीकॉम साइट्स~~

LIGHTENING AND SURGE PROTECTION

OF TELECOM SITES

(STANDARD No.: TEC 66130:2024)

ISO 9001:2015

दूरसंचार अतियांतिकी कें द्र
खुर्शीदलाल भवन ि◌वन, जनपथर्नपथ, नई दिल्लीतदल्ली–110001,
इंडिया-ि◌ारि

TELECOMMUNICATION ENGINEERING CENTRE

KHURSHIDLAL BHAWAN, JANPATH, NEW DELHI–110001, INDIA

www.tec.gov.in

Release ~~43~~: XXX~~July~~, 2025~~4~~

FOREWORD

Telecommunication Engineering Centre (TEC) is the technical arm of Department of Telecommunications (DOT), Government of India. Its activities include:

- Framing of TEC Standards for Generic Requirements for a Product/Equipment, Standards for Interface Requirements for a Product/Equipment, Standards for Service Requirements & Standard document of TEC for Telecom Products and Services
- Formulation of Essential Requirements (ERs) under Mandatory Testing and Certification of Telecom Equipment (MTCTE)
- Field evaluation of Telecom Products and Systems
- Designation of Conformity Assessment Bodies (CABs)/Testing facilities

- Testing & Certification of Telecom products
- Adoption of Standards
- Support to DoT on technical/technology issues

For the purpose of testing, four Regional Telecom Engineering Centers (RTECs) have been established which are located at New Delhi, Bangalore, Mumbai, and Kolkata.

ABSTRACT

This document enumerates detailed test schedule and procedure for evaluating conformance / functionality / requirements / performance of Lightning and Surge Protection of Telecom Sites as per GR No. TEC 66130:2025~~4~~

CONTENTS

A. HISTORY SHEET

Sl.No.	Document No.	Title	Remarks

1	TEC/GR/FLA/LSP – 001/01/June.2010	Lightning & surge protection of Telecom sites	Release 1
2	TSTP/TEC/GR/TX/LSP - 001/02/JUNE.2017	Lightning & surge protection of Telecom sites	Release 2
3	TEC 66131:2024	Lightning & surge protection of Telecom sites	Release 3
4	TEC 66131:2025	Lightning & surge protection of Telecom sites	Release 4

B. INTRODUCTION

This document enumerates detailed test schedule and procedure for evaluating conformance / functionality / requirements / performance of Lightning and Surge Protection of Telecom Sites as per GR No. TEC 66130:2025~~4~~.

C. General information:

Sn.	General Information	Details (to be filled by testing team)	
1	Name and Address of the Applicant		
2	Date of Registration		
3	Name and No. of GR/IR/Applicant's Spec. against which the approval sought	Lightning & surge protection of Telecom sites	TEC 66130 :2025~~4~~
4	Details of Equipment		
	Type of Equipment	Model No.	Serial No.
(i)			
(ii)			
5	Any other relevant Information:-		

D. Testing team: (to be filled by testing team)

S. No.	Name	Designation	Organization	Signature

1.				
2.				
3.				

E. List of the Test Instruments:

S. No.	**Name of the test instrument**	**Quantity**	**Make /Model** (to be filled by testing team)	**Validity of calibration** (to be filled by testing team)	**Remarks**
1.	8/20 µs Current impulse and residual voltage measuring system				
2.	Surge Generator 8/20 µs				
3.	Surge Generator 10/350 µs				
4.					
5.					

6.					
7.					
8.					

F. Equipment Configuration Offered: (to be filled by testing team)

(a) <Equipment/product name> Configuration:

S.No.	Item	Details	Remarks(refrences parameter and value)

Relevant information like No. of cards, ports, slots, interfaces, size etc. may be filled as applicable for the product

(b) <Other equipment name> Configuration:

S.No.	Item	Details	Remarks

Relevant information like No. of cards, ports, slots, interfaces, size etc. may be filled as applicable for the product

G. Equipment System Manuals: (to be filled by testing team)

Availability of Maintenance manuals, Installation manual, Repair manual & User Manual etc. **(Y/N)**

H. Clause-wise Test Type and Test No.:

Clause No.	**Content of the clause**	**Type of Test / Test No. etc.**
1.0	**Scope**	

1.1	This document contains the generic requirements for Lightning and Surge Protection of Telecom Site in Indian telecom network. The Lightning & Surge Protection System Stage-I & II (Type 1 + 2) in TT configuration shall be installed at the entry of AC mains of the telecom site to protect the complete site against direct lightning strike and switching surges as per this GR. The Lightning & Surge Protection system shall be compatible with other electrical appliances at the site.	Information
1.2	**Functional and Technical Requirements**	
1.2.1	**Functional Requirements** The Lightning and High Voltage Surge Protection devices, comprising of coordinated Stage-I and Stage-II Protective devices (separately installed or combined/cascaded) in TT configuration shall be deployed/provided ~~certified from labs accredited by ILAC signatories from non-border sharing countries or TEC designated labs.~~ Combined/cascading is the term used to describe the method of combining two stages (I & II) of surge protection devices into one installation as shown in Figure 1(b) ~~of the standard GR document~~.	Test Certificate by Lab accredited by ILAC signatories countries ~~ILAC signatories from nonborder sharing countries~~or TEC designated labs or NABL Accredited Labs in India.

1.2.1.1	The two-stage protection, stage I & stage II separately installed or stage I & stage II combined/cascaded shall be designed in TT configuration as shown in Annexure (Fig-1(a)& 1(b)), to protect the whole station, as detailed	Testing as per the requirement mentioned in the clause. Test Certificate by Lab accredited by ILAC signatories ~~from border sharing~~ countries or TEC designated labs or NABL Accredited Labs in India. Test setup for testing is given test setup 1, 2, and 3.

below.

Stage-I Protection

This protection, against Lightning Electromagnetic Impulse (LEMP) and other high surges, shall be provided at the distribution panel provided at the mains supply panel. These protections shall be in compliance with IEC 62305:2010 & IEC 60364-5- 53:2019 and IEC 61643-11: 2011, IEC 61643- 12:2020 and EN 61643-11: 2012 for the following values of current:

(i) For three Phase and single phase supply

Between	Requirement
R, Y, B & N	Greater than or equal to: Iimp: 25 KA, 10/350 µs for each Phase; In: 25KA @8/20 µs for each phase
N & PE	Greater than or equal to : Iimp: 100KA, 10/350 µs; In: 100KA @8/20 µs

.

For Single Phase supply

Between	Requirement
L & N	Greater than or equal to :Iimp: 25 KA @ 10/350 µS ; In:25KA @8/20 µS
N & PE	a) Option- I Greater than or equal to : Iimp: 50 KA @ 10/350 µS ; In:50 KA@8/20µS b) Option- II Greater than or equal to : Iimp: 100 KA @ 10/350 µS ; In: 100 KA@8/20 µS

Iimp: Value of lightning impulse current @10/350 µSs

In: Value of Nominal Discharge current @ 8/20 µSs .

	Purchaser shall specify the protection requirement in respect of Single phase supply i.e. Option I or Option II.	
1.2.1.2	Necessary enclosure and mounting arrangement for these devices will form part of the arrangement depending upon the types of the SPD. The device shall be din rail mountable with the varistor/spark gap module being pluggable per pole. However, if the purchaser/ user requires pluggable per unit device, the purchaser/ user shall specify it..	Testing as per the requirement mentioned in the clause.
1.2.1.3	Technology based on low line-follow or zero line follow current would be adopted as per the requirement of the purchaser. In case of low line– follow current, short circuit current extinguishing value (line depth current extinguishing capacity) without backup fuse/circuit breakers~~fuse~~ shall be as per IEC guideline, with a minimum of 25 KA rms.	Testing as per the requirement mentioned in the clause.

1.2.1.4	Rated voltage for the Stage-I arrestors shall not be less than 300 V. Arrestors connected between line and neutral should withstand or Safe Failure Mode voltage up to 440 Volts for 120 minutes as per IEC61643-11: 2011.	Testing as per the requirement mentioned in the clause. Test Certificate by Lab accredited by ILAC signatories from non-border sharing countries or TEC designated labs or NABL Accredited Labs in India.
1.2.1.5	**SPD status indication** SPD status indication shall be provided as per IEC 60364-5- 53:2019 and IEC 61643-12.	Test Certificate by Lab accredited by ILAC signatories from nonborder sharing countries or TEC designated labs or NABL Accredited Labs in India.

<table>
<tr><td>1.2.1.6</td><td>Protection Voltage
Voltage protection level (Up) for the coordinated stage I & II (Type 1+2) installed or combined/cascaded SPD shall be ≤ 1.5 KV.</td><td>Testing as per the requirement mentioned in the clause.</td></tr>
<tr><td>1.2.1.7</td><td>Stage-II Protection</td><td>Testing as per the</td></tr>
<tr><td></td><td>Protection against, low voltage surges, shall also be provided at the power plant level. This protection shall be equipped with thermal disconnection and potential-free contact for arrestor(s) connected between live & neutral and neutral & earth.

This protection shall be in compliance of IEC 62305: 2010 & 60364-5-53 amendment 1-2002 and amendment 2: 2015 for the following values of current:

Between Protection Requirement

<table><tr><td>R, Y, B & N</td><td>Greater than or equal to In: 20 KA, 8/20 S for each phase</td></tr></table></td><td>requirement mentioned in the clause.

Test Certificate by Lab accredited by ILAC signatories from nonborder sharing countries or TEC designated labs or NABL Accredited Labs in India.</td></tr>
</table>

	<table><tr><td>N & PE</td><td>Greater than or equal to In: 40 KA, 8/20 S</td></tr></table> Where In: Value of nominal discharge current @ 8/20μS. Note: Voltage rating of MOVs shall be more than 320 V.	
1.2.1.8	The response time of the Stage-I protective devices shall be ≤ 100 nanoseconds, and that of Stage-II devices shall be ≤ 25 nanoseconds.	Undertaking to be taken from OEM
1.2.1.9	**Co-ordination between the two stages (If applicable)**	
1.2.1.9.1	The protection devices of the two stages shall be	Testing as per the

	tested to work in tandem and in perfect co-ordination to give complete protection against lightning and surges, and also to ensure that the voltage protection level up to 1.5 KV is ensured for the entire site (if applicable). To cater for this requirement, it is imperative that these devices should be tested simultaneously to ensure perfect coordination. The test agency will accept a Test Certificate by the labs as mentioned in clause 1.2.1 of this chapter, provided the protective devices of both the stages are tested in the same Lab as per testing procedure given in Standard IEC 6164311 and IEC 62305-4 (if applicable).	requirement mentioned in the clause. Test Certificate by Lab accredited by ILAC signatories from nonborder sharing countries or TEC designated labs or NABL Accredited Labs in India.
1.2.1.9.2	The Protective device of the two stages shall be of protection level ≤ 1.5kv	Testing as per the requirement mentioned in the clause.
1.2.1.10	Other features, viz., electronic-triggering for coordination, 'Encapsulated device', plug ability (if applicable) please refer to clause 1.2.1.2 in the GR for ease of maintenance, and other arrangements for the devices, may be decided to ensure complete protection, as per IEC guidelines, of the entire site along with all installations, against lightning strikes and voltage surges.	Testing as per the requirement mentioned in the clause.

1.2.1.11	**Installation procedures of SPDs** All the requirements for these devices shall be adhered to, as per Annexure (Figure 1a, 1b, 1c, 2 & 3). The supplier of the devices shall give the installation procedures in their Installation Manual.	Physical Check

1.2.1.12	The cross-sectional area of the conductor required for Stage-I protection shall not be less than 16 mm^2 and for the second stage shall not be less than 6 mm^2.	Physical Check
1.2.1.13	The failure of stage-I and stage-II protection devices shall create an extendable visual alarm. If required by the purchaser, an extendable audio alarm shall also be created.	Physically check the failure of stage I & stage-II protective devices shall create and extend visual as well as audio alarm (Buzzer shall be Given for Failure Indication).
2.0	**General Requirements**	
2.1	**Accessibility**	Information
2.1.1	All the termination points shall be easily accessible.	Information

2.1.2	All terminals shall be separated by physical barriers to ensure safety.	Physical Check
2.1.3	All the terminals except AC earth shall be electrically isolated.	Physical Check
2.2	**Terminations**	
2.2.1	**AC Terminations**	
2.2.1.1	The input terminals shall be clearly marked as R, Y, B & N for three phase, and L and N for single phase, as applicable.	Physical Check
2.2.1.2	AC input termination shall be suitably protected against accidental touch/contact for the protection of working staff, and shall also have clear and prominent "DANGER" mark. AC terminations shall be standard finger-safe lock-in type connectors conforming to BIS or any other international standard,	Physical Check

	with the concurrence of the test agency.	

2.3	**Cabling and Wiring** All the wires and cables including Unenvying cables used shall be fire retardant as per IS 1554 with amendment 1 (June 94). All the cables & wires including Unenvying cables used shall also be Rodent & reptiles repellent.	Undertaking to be taken from OEM
2.3.1	All wiring shall be neatly secured in position and adequately supported. Where wires pass through any part of a metal panel or cover, the hole through which they pass shall have the suitable bush.	Physical Check
2.4	**Earthing** Suitable terminals shall be provided for terminating earth conductors, as per IS standards.	Physical Check
2.5	**Mounting of component & layout**	
2.5.1	Component mounting and fixtures shall be secured.	Physical Check
2.5.2	In case of pluggable modules, suitable mechanical structure/ arrangement for holding them in position shall be provided so that they are held firmly.	Physical Check

2.6	**Documentation** Technical literature in English and Hindi with complete layout, detailed block schematic and circuit diagrams of its assemblies shall be provided. A soft copy as well as a hard copy of the above shall also be provided. All aspects of installation, operation, maintenance, trouble shooting and replacement shall be covered in this manual. The manual shall also include the following:	Physical Check

	a) Installation, Operation and Maintenance: i) Safety measures to be observed in handling of the equipment. ii) Precautions at the time of installation, operation and maintenance. iii) Procedures for routine maintenance, preventive maintenance (by carrying out inspection as per IEC 62305-3:2010), trouble shooting and replacement. iv) Complete layout, detailed block schematic and circuit diagrams of its assemblies. **b) Replacement manual:** i) List of replaceable parts used with the source of procurement. ii) Detailed ordering information for all replaceable parts for ordering of spares as and when required. iii) Procedure with flowchart for trouble shooting and sub-assembly replacement. iv) Test Instruments, Test fixtures, accessories and tools required for maintenance and repair. v) Systematic trouble shooting charts (fault-tree) for probable faults and their remedial action.	

	vi) Address and telephone numbers of Maintenance centre.	

2.6.1	Hard copy of the documentation shall be prepared using good quality paper with clear and crisp printing. All the drawings in clear printing shall be attached to	Physical Check
	the hand-book binding. The binding of the manual shall be long lasting and presentable. One set of flow chart drawings necessary for trouble-shooting shall also be provided with lamination, with each manual.	
2.7	**Quality Requirements**	
2.7.1	**Components** The components of the equipment shall be of industrial grade from reputed manufacturer to ensure prompt and continuous service and delivery of spare parts.	Undertaking to be taken from OEM
2.7.1.1	Fuses or circuit breakers shall be provided wherever appropriate for the protection against failure of control/sensing circuit. Fuse/circuit breakers~~Fuses~~ shall conform to B.I.S specification.	Undertaking to be taken from OEM
2.7.1.2	**Component Approval** The components used in the Lightening & Surge Protection system shall be certified by recognized National/International Institutions. Components shall neither be combustible nor support combustion.	Test Certificate of NABL approved Lab may be taken from OEM.

	NABL approved test reports are also be acceptable.	
2.7.2	**Quality and Workmanship:** a) The equipment shall be manufactured following international quality management systems ISO9001-2015, for which the manufacturer shall be duly accredited. A quality plan describing the quality assurance system followed by the manufacturer would be required to be submitted. b) All wiring shall be neatly secured in position and adequately supported.	Physical Check
2.7.3	**Quality Assurance Tests** Each set of the units supplied against the specific	OEM has to submit the Document for Quality
	order, after type approval, shall be inspected and tested to ensure that the requirements of this document have been met. These tests shall be carried out by QA wing of BSNL.	Assurance Tests

2.7.4	**Finish and painting** The finish of the structure shall conform to color Siemens grey, RAL7035 for indoor or outdoor usage with coating thickness 70 to 130 microns.	Physical Check
2.7.5	**Marking and Labelling**	
2.7.5.1	All terminals shall be properly sign-written and all components properly labelled so that it shall be easy to identify them with reference to the supplier's Instruction and Maintenance Manuals. Designation of keys, switches and other components and their operating positions shall be clearly engraved or signwritten. The wiring shall be clearly and permanently identified with the designation or color code which corresponds to the equipment circuit diagram.	Physical Check
2.7.5.2	Fuse/circuit breakers~~Fuse~~ holder identification shall include details of fuse/circuit breakers~~fuse~~ rating and type.	Physical Check
2.7.5.3	A cabling diagram, screen printed or any other better arrangement ensuring better life expectancy shall be placed in the inside of the front door or any other convenient place for ready reference of the maintenance staff.	Physical Check

2.8	**Name plate** A name plate anodised, screen printed or any other better arrangement shall be suitably fixed and shall contain following information: 1. Specification Number: 2. Type of the Unit:	Physical Check
	3. Manufacturer's name and identification: 4. Model No. : 5. Unit Serial No. : 6. TAC/TSEC No. 7. Input voltage and phase: 8. Year of manufacture:	

I. TEST SETUP & PROCEDURES:

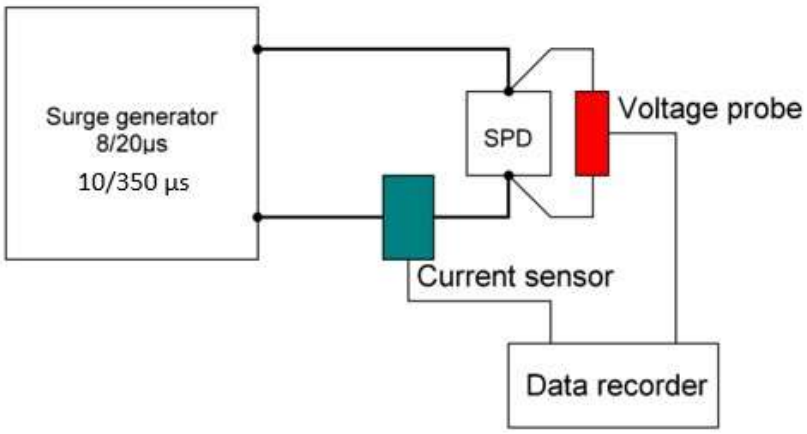
Note:

(a) The test set-up given in this document are tentative and may be changed by testing officer, taking in to account, network/testers/ analyzer/simulator availability. In case of any discrepancy between this TSTP and GR, GR clause shall prevail.

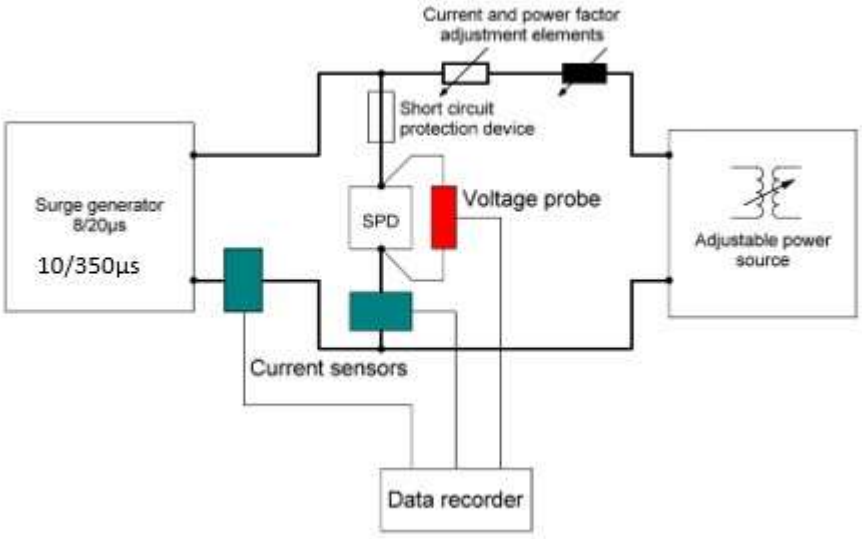
(b) Since this is provisional TSTP, on the basis of inputs received, setup was prepared. Therefore, whenever the first testing will be offered, this provisional TSTP would be revised.

(c) Actual setup and tester/simulator may vary at the time of testing.

(d) Testing of L&SP will be done on the basis on testing facility available for testing L&SP. If no testing facility is available for testing L&SP, then undertaking from OEM may be taken.

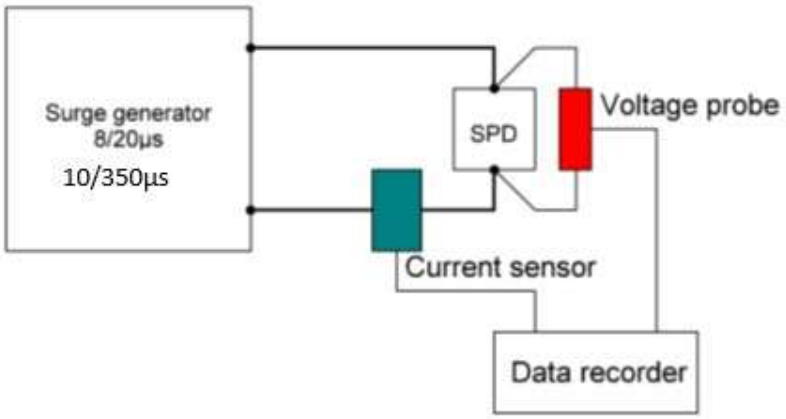
Test No.	**1**
Test Details	**Clause no: 1.2.1.1**
Test Instruments Required	Surge generator
Test Setup	**Type -1: Operating duty test according to clause**  Determine the measured limiting voltage according to clause
Test Procedure	Testing as per the requirement mentioned in the clause.

Test Limits	Test Limits as per standard referred in the clause No. 1.2.1.1
Expected Results	Results as per standard referred in the clause No. 1.2.1.1

Test No.	**2**
Test Details	**Clause no: 1.2.1.1**
Test Instruments Required	Surge Generator
Test Setup	**Type -2: Operating duty test** 

Test Procedure	Testing as per the requirement mentioned in the clause.
Test Limit	Test Limits as per standard referred in the clause No. 1.2.1.1
Expected Results	Results as per standard referred in the clause No. 1.2.1.1

Test No.	**3**
Test Details	**Clause no: 1.2.1.1**

Test Instruments Required	Surge Generator
Test Setup	**Type- 1: Residual voltage with 8/20 current impulse** 
Test Procedure	Testing as per the requirement mentioned in the clause.
Test Limit	Test Limits as per standard referred in the clause No. 1.2.1.1
Expected Results	Results as per standard referred in the clause No. 1.2.1.1

J. SUMMARY OF TEST RESULTS

GR No._____

TSTP No._____

Equipment name & Model No._____

Clause No.	**Compliance** (Complied /Not Complied / Submitted/Not Submitted / Not Applicable)	**Remarks /** **Test Report Annexure No.**

[Add as per requirement]

Date:

Place: **Signature & Name of TEC testing Officer /**

*** Signature of Applicant / Authorized Signatory**

*** Section J as given above is also to be submitted by the Applicant/ Authorised signatory as part of in-house test results along with Form-A. The Authorised signatory shall be the same as the one for Form 'A'.**

End of Document