

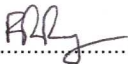
Ref:	NR/L2/TEL/30070
Issue:	2
Date:	7 th March 2009
Compliance date:	5 th September 2009

Level 2

Specification for the Maintenance of Telecoms Copper Cables

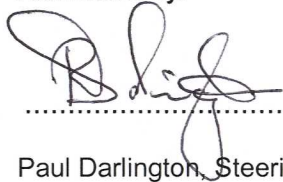
Endorsement and Authorisation

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Fred Perry, Working Group Chair

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Accepted for issue by:



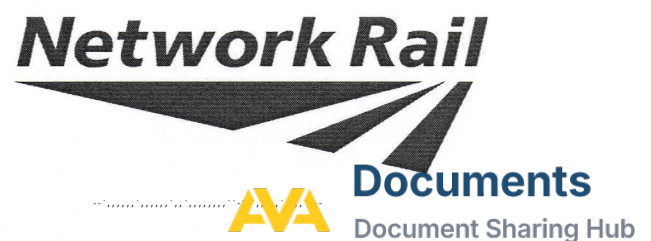
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Issue record

Issue	Date	Comments
1	June 2006	First Issue
2	March 2009	Renumbered, was NR/WI/TEL/30070. Preliminary tests added to V_L and V_T tests, and screening conductor earth tests now only performed only when V_L results are poor.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 05/09/2009.

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 4 to continue to comply with the Issue of any relevant Network Rail Standards current when GRIP Stage 4 was reached and not to comply with requirements contained herein, unless the designated Standard Owner has stipulated otherwise in the accompanying Briefing Note.

Reference documentation

GK/RT0105	The Transmission of Safety Related Information
NR/SP/TEL/30036	Specification for Booster Transformer Outages: Managing the Consequences for Telecommunications Systems
NR/SP/TEL/31001	Telecommunications Maintenance Testing & Failure Investigation
NR/L2/TEL/31002	Maintenance of Telecommunications Equipment
NR/WI/TEL/00113	Wiring of Copper Telecoms Terminations
NR/PS/TEL/00015	Copper Telecommunications Cables
SP/FTN(D&D)/005	FTN Specification for jointing, Terminating and Testing Copper Telecoms Cables
SP/FTN(D&D)/009	FTN Network Design Manual for Copper Cables
SP/FTN(D&D)/016	FTN Specification for Identification and Labelling of Network Elements

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1 Purpose

This telecoms maintenance instruction defines the maintenance requirements for copper cables in use on Network Rail infrastructure.

The purpose of undertaking cable noise immunity tests, in AC electrified areas, is to ensure that voltages induced into telecommunications cables are within safe limits and that noise levels are not causing interference to the operation of telecom systems and services.

2 Scope

This instruction applies to all persons engaged in the maintenance of telecoms copper cables for Network Rail.

The VL & VT tests are designed to produce data on which to base an assessment of the protection afforded by the immunisation system.

3 Definitions (in addition to those defined in NR/L2/TEL/31002).

AC

Alternating Current

Condition Test Pair

A cable pair to be tested to assess the condition of a copper cable

CPU

Cable Pressurisation Unit

dBm

A logarithmic unit of measurement - relative to 1 milliwatt

FTN

Fixed Telecom Network

Legacy Network

Network Rail's telecoms assets installed prior to 01/04/1994

Prove

Undertake a positive test

psi

Pounds per Square Inch

rms

Root Mean Squared

TME

Telecoms Maintenance Engineer

V_L

Longitudinal Induced Voltage

V_T

Transverse Induced Voltage

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4 Responsibilities

The maintainer shall take suitable precautions so that no interruption, disconnection or interference is caused to working circuits that are present in the cables under test. Precautions shall also be taken where other terminated cables carrying safety critical circuits exist in close proximity to the cable being tested.

Work shall not commence until all precautions are in place. The signaller(s) relevant to the area where cables are being tested must be advised in accordance with the requirements of the Rule Book GE/RT 8000 that cable testing is being undertaken.

Maintenance shall follow the requirements and frequencies as detailed in the attached appendices.

1. Appendix A – Maintenance for Telecom Cable Noise Immunity
2. Appendix B – Maintenance of Cable Pressurisation Units
3. Appendix C – Maintenance of Quad and Paired Copper Cables

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Appendix A Maintenance for Telecom Cable Noise Immunity

This appendix applies only to lineside copper cables in AC electrified areas.

Noise immunity tests shall only be undertaken when it has been ascertained that there are no booster transformer outages and that the electrification system is working in the manner as designed.

The purpose of these tests is to confirm that whilst under test, the immunisation system is offering a level of protection and that telecoms cables within a line of route are not supporting induced voltages that:

- exceed the longitudinal voltage (V_L) limits of 60 V rms, which is deemed a hazardous condition
- exceed the transverse voltage (V_T) of 1 mV psophometrically weighted
- show significant degradation on previous V_L & V_T measurements, indicating possible infrastructure faults.

These tests need only be performed on a single telecoms cable within the line of route. The cable selected shall typically be a main cable having sufficient length along an electrified line to obtain representative figures associated with the effects of traction based interference.

Frequencies of Maintenance	
	<u>Default</u>
V_L & V_T Test	12 Monthly

Test Requirements

The maintainer shall undertake the following steps:-.

- | | |
|-------------------------------|--|
| Preliminary tests | If test pairs are already established, follow the Preliminary Tests specified below. |
| Set up for tests | Set up V_L and V_T test pairs as shown in the figures below and connect test equipment meeting the specifications given below. |
| Carry out V_L & V_T tests | Record V_L and V_T for a period of 3 hours in peak traffic at a minimum record rate of 1 sample per second. |
| Review results | Review the results, determine the appropriate actions and inform the TME, as specified below. |