

Information for users

The following document:

NR/L2/TEL/30088
Issue 3

has had changes made to it, most recently, with effect from **1 November 2015**.

Instructions for use

It is essential that you first read and understand each letter of instruction pertaining to the standard before proceeding to use the standard. You must then apply the requirements of each letter to the standard.

NR/BS/LI/362	Issue 1	01 November 2015	Proceed to letter ►
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For further information, please contact:

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Date:	04 June 2011
Compliance date:	04 June 2011

Level 2

Specification for Mast Inspections and Maintenance of Antenna Systems and Feeders.

Endorsement and Authorisation

Endorsed by:



Colin Mitchell Working Group Chair

Authorised by:



Steve Hailes Steering Group Chair

Accepted for issue by:



Mick McManus, National Standards Manager

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Issue record

Issue	Date	Comments
1	June 2006	First Issue
2	March 2009	Renumbered, was NR/WI/TEL/30088. Scope amended to indicate that the instruction does not apply to masts and antennas installed as part of the GSM-R system
3	June 2011	Scope and content amended to include GSM-R systems

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 04 June 2011

When this standard is implemented, it is permissible for all projects that have formally completed GRIP Stage 3 (Option Selection) to continue to comply with the issue of any relevant Network Rail Standards current when GRIP Stage 3 was completed and not to comply with requirements contained herein, unless stipulated otherwise in the scope of this standard.

Reference documentation

NR/SP/ELP/21085	Design of Earthing and Bonding Systems for 25kV AC Electrified Lines
NR/LT/TEL/30034	Radio Mast Lighting and Earthing System
NR/SP/TEL/31001	Telecommunications Maintenance Testing & Failure Investigation
NR/L2/TEL/31002	Maintenance of Telecommunications Equipment.
NR/L2/TEL/30074	Maintenance of Telecoms Earth & Screening Systems
NR/L3/TEL/0092	Applying for "At Risk" Work Activity/Disconnection of Telecoms bearer circuits and systems including GSM-R
HSE	Working at Height Regulations 2005

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1 Purpose

This instruction defines the maintenance requirements for antenna, feeder systems, masts, monopoles, poles, RDS frames and mast frames in use on Network Rail infrastructure.

The purpose of maintaining and testing these systems is to decrease the incidence of failures through deterioration and to identify potential failures before they become service affecting and to identify any problems with Fall Arrest systems or structural integrity of towers that may present a hazard to staff required to climb towers for faulting and planned maintenance purposes.

2 Scope

This instruction shall apply to all persons engaged in the maintenance of antenna systems and radiating cable systems used on Network Rail radio communications equipment.

The maintenance requirements for earthing system associated with masts is detailed in NR/L2/TEL/30074 Maintenance of Telecoms Earths and Screening Systems.

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

ESSD

Electrostatic Sensitive Devices

Fall Arrest system

A system providing a means of attachment for personal protective equipment against falls from height.

FDR

Frequency Domain Reflectometer

GSM-R

Global System for Mobile communications-Railway variant

Main Earthing Terminal

The terminal, or bar, provided for the connection of protective conductors and connections to the Master Earth Electrode.

OHLE

Overhead Line Equipment

Ofcom

Office of Communications

RF

Radio Frequency.

SSI

Solid State Interlocking

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TDR

Time Domain Reflectometer

VSWR

Voltage Standing Wave Ratio

4 Responsibilities

If any maintenance work shall impact upon any operational radio system, or is to be performed on or near the operational railway, then the relevant Network Rail Control office and/or Signaller(s) in the affected area shall be informed before work starts and upon completion of the work and a clear understanding shall be in place.

Additionally, radio systems may be carrying safety critical circuits such as SSI data links, OHLE traction supervisory pilots etc. Care shall be taken to confirm required notice periods are complied with before disconnection of these systems.

Where required, staff shall be competent in working at height, understand the safety of others below and emergency rescue preparedness and not working when at risk from thunderstorms and microwave radiation etc.

All defects identified during maintenance shall be reported via fault control for entry into the fault recording database for further investigation.

All actions taken by the maintainer or maintainers representative to correct deficiencies identified during maintenance shall be detailed on the maintenance work return.

Work to be undertaken on GSM-R equipment where proximity to RF transmission is deemed to be a risk shall only go ahead with the permission of Stoke TEC and the equipment shall be "made safe" prior to any work commencing within the affected areas as directed in NR/L3/TEL/0092.

The maintainer shall follow the procedures and frequencies as detailed in the attached appendices.

Appendix A – Maintenance of RF Antennas

Appendix B – Maintenance of Radiating Cable systems

Appendix C – Maintenance of Microwave Antennas

Appendix D – Inspection of Legacy Radio System Towers and Fall Arrest systems

Appendix E – Inspection of GSM-R Towers, Antennas, Feeders, Monopoles, Poles, RDS Frames, Mast Frame and Fall Arrest systems

Where more than one service has been scheduled for a maintenance visit, the services shall be performed in reverse alphabetic order.

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Appendix A Antennas, Radio Communication Equipment.

Frequencies of Maintenance	
	<u>Default</u>
Service A	Yearly
Service B	Yearly <i>Applicable only after 7 years of system carrying traffic</i>

SERVICE A – General Inspection

This appendix applies to all radio equipment comprising the antenna system, from the output of the radio equipment up to and including the antenna. This includes, but is not limited to, patch-panels, isolating transformers, phasing harnesses, feeder cables, attenuators and combiners.

Where due to the siting of the antenna (for example where it is attached to a pole, guyed pole, OHL structure, the side of a building or tunnel portal) then the following checks may be conducted from a place of safety using binoculars to make a visual assessment This fact shall be recorded on the maintenance work return.

Where practical and required Antenna system maintenance will be scheduled at the same time as the maintenance of the radio equipment to allow for disconnection and intrusive testing to be performed on the antenna system.

If the radio equipment maintenance cannot be carried out during day-time (for operational reasons) the maintenance checks requiring day-light will need to be scheduled separately.

Service A

- A1 Check that the antenna is correctly mounted with regard to any drain holes where applicable in its construction.
- A2 Check that the antenna is securely fixed to the supporting structure.
- A3 Check that the antenna is facing along the correct bearing and at the correct height by referring to the Ofcom licensing records. If these are not available then local records should be used.
- A4 Visually check that the connection between the antenna and the feeder is secure and not damaged nor shows visible evidence of water ingress. Check that any weather proofing is reinstated (such as self amalgamating tape) after any intrusive inspection.
- A5 Check that the visible parts of the feeder cable from the antenna to the patch-panel are in good order and securely fixed to the pole, mast etc with no visible damage and pressurised if so designed.
- A6 Check feeder cable ties and replace as required.