

Ref:	NR/L1/TEL/30102
Issue:	1
Date:	5 September 2009
Compliance date:	5 September 2009

Issue record

Issue	Date	Comments
1	September 2009	New document

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 5 September 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

Disclaimer

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Supply

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1 Purpose

The purpose of this document is to set the principles of how Telecommunications Assets are to be managed through their life-cycle to meet the defined output requirements for each Route.

2 Scope

2.1

This policy supports the overall Network Rail Asset Management Policy and is a part of a series of policies published by each engineering discipline. It covers the full life cycle management of Telecommunications Assets from design, through construction, operation, inspection and maintenance to decision to renew, alter or take out of use.

2.2

Telecommunications Assets provide the communication links between both people and equipment that are vital to the efficient operation of the railway.

Essential train running information is provided directly to passengers at stations by Telecommunications Assets.

2.3

There are no specific outputs relating to telecommunications, but high performing telecommunications assets support the achievement of train performance and punctuality targets, cost efficiency targets and required outputs.

There is a defined Key Performance Indicator (KPI) identified for Telecommunications Assets as part of the Asset Stewardship Index (ASI) that objectively indicates impact on train performance and asset condition.

2.4

Network Rail's telecommunications assets are grouped into three technology areas:

- Operational Communications;
- Communication Networks;
- Station Information and Surveillance Systems (SISS).

2.5

Essential systems supported include:

- Bearer systems for electrification and signalling control;
- Lineside to signaller communication;
- Driver to signaller and control radio;
- Telephone concentrators;
- Driver only operation (DOO) CCTV;
- Level crossing telephone systems;
- Voice recorders;
- Cable and transmission systems;

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- Customer information systems at sub-surface stations.

3 Definitions

Asset Accountability Matrix	The Asset Accountability Matrix specifies generically who is accountable for which assets.
Asset Management Plan	An overall description of the combined maintenance and renewal plans.
Asset Stewardship Index	A composite measure of Network Rail asset performance.
Key Performance Indicator	The measure used to determine how assets are performing.
Network Availability	The Network Rail CP4 output measure of disruption to the network caused by planned engineering works.
Route	Network Rail strategic route
Route Requirements Plan	Consolidation of all the requirements for a route packaged within the constraints of the technical requirements.
Station Facility Owner	The Train Operating Company (TOC) at stations leased from Network Rail.
Technical Strategy	A document produced by the Professional Head that provides a roadmap as to how the policy will be delivered across the telecoms portfolio.
Telecommunications Assets	Those assets identified as telecoms in the accountable engineering discipline section of the Asset Accountability Matrix.
Train Service Performance	The Network Rail CP4 output measure of train delay and cancellations.

4 Policy statements

Number	Policy Statement
Telecoms-01	Telecommunications Assets shall be managed to deliver the required performance, functionality and capability to meet the defined outputs at the lowest whole life cost.

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Number	Policy Statement
Telecoms-02	<p>Technical Strategies for each technology group shall be implemented that:</p> <ul style="list-style-type: none"> • Define asset vision; • Determine the process to capture user requirements; • Define the overall performance, functionality and capability required of telecommunications assets; • Define product strategy; • Define nominal equipment lifecycles; • Define nominal maintenance intervention cycles.
Telecoms-03	<p>Route telecommunications requirements shall be determined using Route Requirements Plans and shall specify the required performance, functionality and capability of telecommunications assets particular to the Route.</p> <p>For across Route assets, such as GSM-R and FTN, network requirement plans may be necessary.</p>
Telecoms-04	<p>Maintenance intervention shall be undertaken on Telecommunications Assets only when:</p> <ul style="list-style-type: none"> • The risk of a reduction in performance has become unacceptable; • The required functionality and capability cannot be assured.
Telecoms-05	<p>Telecommunications Assets shall be renewed when:</p> <ul style="list-style-type: none"> • Maintenance intervention is not able to sustain the required asset condition, performance and capability; • The risk of non-repairable failure has become unacceptable; • The equipment is obsolete, spares availability is restricted or not available and manufacturers support, where vital, is discontinued; • Continued maintenance (including support costs) would cost more than replacement.
Telecoms-06	<p>Cross industry standard commercial off-the-shelf products shall be used where possible.</p>
Telecoms-07	<p>The bearer network and associated system performance shall be pro-actively monitored using centralised network control, to enable maintenance and faulting response to meet the Train Service Performance and Network Availability requirements.</p> <p>Where not integral, telecommunications systems shall be capable of connection to remote condition monitoring equipment through industry accepted protocols.</p>

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Number	Policy Statement
Telecoms-08	The bearer network shall be designed to be cost effective and provide the resilience and availability appropriate for business needs, taking account of changes to the future capacity requirements of each route where these have been agreed. The proximity of transmission nodes and client system requirements shall be taken into account when specifying cable capacity and capability.
Telecoms-09	Cable routes shall be appropriate to the security requirements of the Route, be constructed of lowest whole life cost materials and shall consider current and future capacity requirements.
Telecoms-10	Radio system coverage, capacity and performance shall be sufficient to meet the defined KPIs.
Telecoms-11	Secure communications for drivers and signallers shall be provided by the national GSM-R radio system, which is replacing existing legacy radio systems.
Telecoms-12	The NRN/ORN, CSR and RETB networks shall be life-extended to maintain network availability until they are replaced by the national GSM-R network.
Telecoms-13	Prior to full GSM-R deployment, emergency communications systems shall be provided where determined by risk assessment as being necessary to complement axle counter schemes.
Telecoms-14	Operational lineside communications systems shall be rationalised where GSM-R or other suitable systems are available subject to risk assessment.
Telecoms-15	Rail Industry stakeholders shall be engaged to redefine and re-engineer level crossing public voice communication presentation and functionality.
Telecoms-16	Station Information & Surveillance Systems (SISS) shall: <ul style="list-style-type: none"> • Where capacity is available, use the Network Rail Fixed Telecoms Network (FTN) for station to station and station to control system/centre links; • Use IP as the primary means of interface connectivity; • Use open protocol systems to allow common interface with other systems; • Operate over common infrastructure cabling at stations - wireless connectivity shall be utilised where appropriate and practical; • Derive source data from Network Rail systems to maintain accuracy and consistency.

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Number	Policy Statement
Telecoms-17	<p>At stations where the Station Facility Owner (SFO) is not Network Rail:</p> <ul style="list-style-type: none"> • There shall be clear demarcation of asset ownership - drawings and equipment shall be labelled accordingly; • Network design shall allow use of Train Operating Company (TOC) Wide Area Networks (WAN) as well as Network Rail FTN (where capacity is available).

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Appendix A

A.1 Introduction

The telecommunications network is shown schematically in Figure A.1. It comprises three technology groups:

- Operational Communications;
- Communication Networks;
- Station Information and Surveillance Systems.

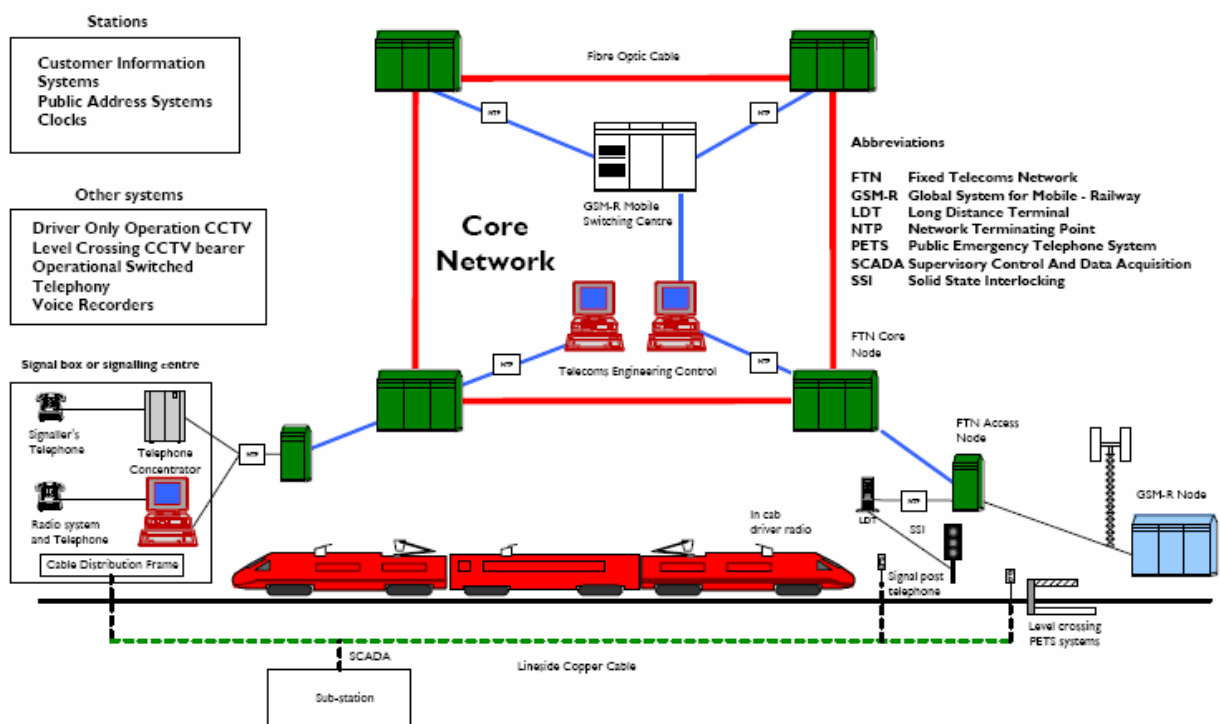


Figure A.1 – Telecommunications Network

There are common factors that apply to all telecommunications technology groups that differentiate them from other engineering disciplines within Network Rail. The nature of development in the telecommunications industry has historically resulted in shorter life-cycles and higher rates of equipment refresh than in other engineering disciplines. Recently however, considerable consolidation and realignment amongst both telecommunications equipment suppliers and operators has taken place with the emergence of the dominant global trend for migration of traditionally separate data and voice telecommunications networks to a single converged platform. Converged networks potentially offer increased flexibility, reduced costs and improved performance for the customer, but have the trade-off of usable equipment lifecycles being more comparable with those of Information Technology (IT) than traditional telecommunications.

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Telecommunications service providers such as BT are moving to full convergence using Internet Protocol/Multi Protocol Label Switched (IP/MPLS) based service provision. Our network needs to interface with third parties and therefore we have adopted a strategy that converges where appropriate whilst continuing to operate legacy systems that support other engineering disciplines until it becomes technically possible to convert or migrate them also.

A.2 Operational Communications

A.2.1

Operational Communications is the group name for Fixed Lineside Systems and Radio Systems.

A.2.2 Fixed Lineside Systems

Fixed lineside systems include:

- Telephone concentrator systems and telephones located on the lineside and at signal posts to allow train drivers to contact signallers;
- Telephone links from level crossings for public and operational use;
- CCTV systems used for Driver Only Operation trains;
- Voice recorders for the recording of safety critical voice communications.

A.2.3 Radio

We operate four radio networks (three analogue and one digital) comprising base stations, antenna systems and control equipment. The analogue systems support the National Radio Network (NRN), Cab Secure Radio (CSR) and Radio Electronic Token Block (RETB). A new digital radio network based on GSM mobile telephony technology (GSM-R) is currently being rolled out, and progressively during CP4 into CP5, the three analogue systems will be decommissioned.

A.3 Communication Networks

The Communication Network is the bearer telecommunications network and comprises transmission systems, optical fibre cables, main copper cables and cable route. It provides circuits and services for signalling and electrification control systems, train radio systems, lineside communications, level crossing CCTV and customer information systems. Where cost-effective it may also meet the needs of general Network Rail information management and business telephony.

A.4 Station Information and Surveillance Systems (SISS)

SISS consist of customer information systems, public address systems and clocks provided on station platforms and concourse areas as well as CCTV systems provided to monitor public safety and capture video images for security purposes.

A.5 Asset Populations

The table below shows Network Rail telecommunications asset population as at January 2009.

Operational asset quantities are held in Ellipse and SISS asset quantities are held by the Renewal & Enhancement Engineers.

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Description	Main Sub-division	Quantity
Signal Box Concentrators	Greater than 128 lines	57
	17 to 128 lines	209
	Up to 16 lines	527
Lineside Telephones (associated with concentrators)	Central battery	29,604
	Selective	658
	Others	3,281
Driver Only Operation CCTV	Stations	389
Public Level Crossing Systems	Whiteley	370 level crossings
Voice Recorders	Sites	736
Operational PABX	ICC	10
Electrification Voice Facilities	ECR	15
Cable Route	Cable route	13,500 km
Telecoms Cables	Legacy Copper Cable	14,500 km
	Legacy Fibre Cable	1,000 km
Fixed Telecoms Network (FTN)	FTN Copper Cable	3,300 km
	FTN Fibre Cable	13,600 km
	FTN Core Nodes	129
	FTN only access sites	548
	FTN/GSM-R co-located sites	2200
Global System for Mobile communications – Railway (GSM-R)	Mobile Switching Centres (MSC)	2
	Base Station Controller (BSC)	8
	Base Transceiver Station (BTS)	2,200
	Interim Voice Radio System (IVRS) schemes (using GSM-R infrastructure)	5
Legacy Radio	NRN systems	21
	ORN systems	21
	CSR – Management Processor	45
	CSR – Signallers Processor	124
	RETB systems	4
Station Information & Surveillance Systems	Station Management Systems	1
	Public Address (speakers)	20368
	Customer Information Systems (monitors)	4396
	Clocks	541
	Surveillance CCTV (cameras)	1904
	Help Points	112

Table A.1 – Telecommunications Asset Populations

Standards Awareness Briefing Note



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Title: Network Rail Asset Management Policy – Telecommunications Engineering			
Standard Owner: Head of Telecoms Engineering			
Non-Compliance rep (NRNC): Principal Policy & Standards Engineer (Telecoms)			

<p>Purpose: The purpose of this document is to set the principles of how Telecommunications Assets are to be managed through their life-cycle to meet the defined output requirements of each Route.</p>	<p>The following teams require briefing A = Awareness, T= Technical</p> <table border="0"> <tr> <td></td> <td style="text-align: center;">A</td> <td style="text-align: center;">T</td> </tr> <tr> <td>Executive Management Group</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Commercial Property</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Strategic Sourcing</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Corporate Development</td> <td style="text-align: center;"><input type="checkbox"/></td> <td 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Planning & Regulation	<input type="checkbox"/>	<input type="checkbox"/>																																																																																																																																																																																									
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Contractors	<input type="checkbox"/>	<input type="checkbox"/>																																																																																																																																																																																									
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Contractors (Off Track)	<input type="checkbox"/>	<input type="checkbox"/>																																																																																																																																																																																									
<p>Scope: This policy supports the overall Network Rail Asset Management Policy and is a part of a series of policies published by each engineering discipline. It covers the full life cycle management of Telecommunications Assets from design, through construction, operation, inspection and maintenance to decision to renew, alter or take out of use.</p>																																																																																																																																																																																											
<p>What's New/Changed: This is a new standard that replaces the Telecoms Policy document submitted to the ORR as part of the CP4 bid in September 2007. The standard specifies high-level requirements for the management of telecoms assets to meet the defined outputs; in particular:</p> <ul style="list-style-type: none"> • Technical strategies for each telecoms technology group; • Telecoms requirements particular to Routes; • Maintenance intervention and asset renewal; • Centralised network control; • Radio system requirements in the transition to full GSM-R implementation; • Operational lineside telephone rationalisation, and; • Station Information and Surveillance Systems. 																																																																																																																																																																																											
<p>Affected documents:</p> <table border="0"> <tr> <td style="text-align: left;"><i>Reference</i></td> <td style="text-align: left;"><i>Impact</i></td> </tr> <tr> <td>None</td> <td>This is a new standard</td> </tr> </table>	<i>Reference</i>	<i>Impact</i>	None	This is a new standard																																																																																																																																																																																							
<i>Reference</i>	<i>Impact</i>																																																																																																																																																																																										
None	This is a new standard																																																																																																																																																																																										
<p>Implementation requirements: <i>(The following posts have specific responsibilities within this standard and shall receive technical briefing as part of the Implementation Programme)</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Post</th> <th style="width: 50%;">Team</th> </tr> </thead> <tbody> <tr> <td>Principal Technology Engineers</td> <td>Head of Telecoms Engineering</td> </tr> <tr> <td>Principal Renewal & Enhancement Engineers (Control & Communication)</td> <td>National Renewal & Enhancement Engineer (Control & Communication)</td> </tr> </tbody> </table>	Post	Team	Principal Technology Engineers	Head of Telecoms Engineering	Principal Renewal & Enhancement Engineers (Control & Communication)	National Renewal & Enhancement Engineer (Control & Communication)																																																																																																																																																																																					
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Principal Technology Engineers	Head of Telecoms Engineering																																																																																																																																																																																										
Principal Renewal & Enhancement Engineers (Control & Communication)	National Renewal & Enhancement Engineer (Control & Communication)																																																																																																																																																																																										
<p>For further information contact: Name: Richard Feasby Contact number: 085 33205 Email: richard.feasby@networkrail.co.uk</p>																																																																																																																																																																																											