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| Ref   | NR/SP/TEL/30133 |
| Issue | 1               |
| Date  | April 2007      |

# Specification

## Asset Condition Assessments for Telecommunications Equipment.

### Endorsement & Authorisation

Endorsed by:



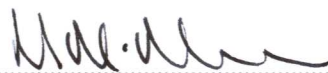
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## Issue record

| Issue | Date       | Comments      |
|-------|------------|---------------|
| 1     | April 2007 | New Standard. |

## Implementation

This Specification shall be implemented from 7<sup>th</sup> April 2007

## Compliance

This Network Rail Specification is mandatory and must be complied with by Network Rail from 2<sup>nd</sup> June 2007.

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

Where the Head of Telecoms has specified that all projects will comply with the requirements, specific authority not to comply can be sought in the usual manner using the appropriate non-compliance authority processes described in Network Rail Standard, [NR/SP/STP/045](#) Managing the Process for Non-compliance Authority (formerly RT/LS/P/045).

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## 1 Purpose

This specification sets out the methodology by which telecommunication assets are to be assessed to gauge their condition. This provides visibility by which Network Rail can understand:

- whether the telecoms infrastructure and the use to which it is being put is in accordance with the conditions of its approval and design.
- how the asset condition is performing with regard to its age and environmental conditions.
- how to plan the timely and most cost effective renewal of the asset.
- whether the maintenance regimes are robust enough to deliver the anticipated life expectancy.

Asset condition assessments are not to be confused with asset surveillance checks as detailed in NR/SP/TEL/30033 which are carried out by the maintainer to ensure that all telecom assets are being maintained in accordance with the appropriate maintenance standards.

## 2 Scope

All telecommunications systems, and equipment, that are owned by Network Rail.

S&T cable routes are to be inspected as denoted in NR/WI/TEL/30069 Inspection and Minor Maintenance of Lineside S&T cable routes.

Any on site condition assessments are to be visual and not intervensive in nature. Access to equipment should be limited to the opening of cabinet doors or covers which are designed to be removed easily.

## 3 Reference documentation

[GK/RT 0210](#) Asset Management for the Safety of Signalling and Operational Telecommunications Equipment.

## 4 Definitions

### CCTV

Closed Circuit Television

### CIS

Customer Information Systems

### Commissioning.

The date of bringing the equipment in to active service.

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## **CRT**

Cathode Ray Tube

## **DOO**

Driver Only Operation

## **MMI**

Man Machine Interface

## **NTP**

Network Terminating Point

## **PA**

Public Address

## **PABX**

Private Automatic Branch eXchange

## **PETS**

Public Emergency Telephone System

## **SB**

Signal Box

## **SRTF**

Safety Related Telecoms Failures

## **STS**

STS (Signals) Ltd

## **TFT**

Thin-Film Transistor

## **VDU**

Visual Display Unit

## 5 Asset condition assessment planning

For the purposes of planning a programme of Asset Condition Assessments the following nominal equipment life spans shall be used:

- Voice Recorders = 7 years.
- Radio Base Stations = 15 years
- Telephone Concentrators (non electronic) = 20 years
- Copper cable = 25 years.
- Fibre cable = 30 years.
- Cable route = 25 years from last major refurbishment.
- All other equipment = 10 years.

If the asset is declared as an asset at risk in a risk register then it shall be undertaken yearly in the first financial quarter (April to June) until it is renewed.

For an asset having a 7 year life span the asset condition assessments shall be planned to take place:

- in the year between its 3<sup>rd</sup> and 4<sup>th</sup> anniversary of it's commissioning.
- and then in the first financial quarter (April and June) of the year in between its 4<sup>th</sup> and 5<sup>th</sup> anniversary of it's commissioning.

For an asset having a 10 year life span the asset condition assessments shall be planned to take place:

- in the year between its 5<sup>th</sup> and 6<sup>th</sup> anniversary of its commissioning.
- and then in the first financial quarter (April to June) of year in between its 7<sup>th</sup> and 8<sup>th</sup> anniversary of it's commissioning.

For an asset having a 15 year life span the asset condition assessments shall be planned to take place:

- in the year between its 7<sup>th</sup> and 8<sup>th</sup> anniversary of it's commissioning.
- and then in the first financial quarter (April and June) of the year in between its 12<sup>th</sup> and 13<sup>th</sup> anniversary of it's commissioning.

For an asset having a 20 year life span the asset condition assessments shall be planned to take place:

- in the year between its 10<sup>th</sup> and 11<sup>th</sup> anniversary of it's commissioning.
- and then in the first financial quarter (April and June) of the year in between its 17<sup>th</sup> and 18<sup>th</sup> anniversary of it's commissioning.

Where an assets renewal is deferred beyond its nominal life span then it shall be subject to the following asset condition assessment regime:

- in the first financial quarter (April to June) of year after its 7, 10<sup>th</sup>, 15<sup>th</sup> or 20<sup>th</sup> anniversary of commissioning, as applicable.
- then in the each of the years after the passage of two further anniversaries, timed to occur in the first financial quarter (April to June) until it is renewed.

For cables (Copper & Fibre) an asset condition assessment shall be undertaken:

- when the cable reaches an approx point of half way through its nominal life span (e.g. during the 12<sup>th</sup> anniversary from its commissioning for Copper cables and 15<sup>th</sup> anniversary for Fibre cables).
- and then in the first financial quarter (April to June) of the year in between its 22<sup>nd</sup> & 23<sup>rd</sup> anniversary of it's commissioning for Copper cables and 27<sup>th</sup> & 28<sup>th</sup> anniversary for Fibre cable.

In addition to the programme of assessments detailed above, the Head of Telecoms Engineering may request that additional asset condition assessments be undertaken.

## 6 Asset condition assessment checklists

Each Asset Condition Assessment shall be undertaken, using the appropriate combination of assessment checklists for each product group as shown in the table below:

In order to complete the assessment it will be necessary to gather together information from a number of different sources including a visual inspection of the equipment.

Any defects noted (faults or alarms displayed) during the assessment shall be reported to the maintainers fault control and noted on the Asset Condition Summary sheet (Appendix A).

In all cases the summary sheet shown in appendix A and the Generic checklist shown in Appendix B shall be completed together with the equipment specific checklists as shown in the table below:

| <b>Equipment Group</b>                 | <b>Checklist to use<br/>(Appendix)</b> |
|----------------------------------------|----------------------------------------|
| Telephone Concentrators (Electronic)   | C                                      |
| Telephone Concentrators (Conventional) | C                                      |
| Public Level Crossing Systems (PETS)   | D                                      |
| Public Address                         | E                                      |
| Customer Information Systems           | E                                      |
| CCTV (Retail)                          | E                                      |
| CCTV (DOO)                             | F                                      |
| Uninterruptible Power Supply           | G                                      |
| Rectifier/Charger/Battery              | G                                      |
| Voice Recorders                        | H                                      |
| Radio Systems Control Processor        | I                                      |
| Base Station                           | I                                      |
| PABX                                   | J                                      |
| Transmission systems                   | K                                      |
| Copper Cable                           | L                                      |
| Fibre Cable                            | M                                      |

## 7 Competency

Persons undertaking asset condition assessments shall have been assessed as competent for telecoms engineering activities. The arrangements for assessing such competence shall be in accordance with Network Rail Company standards.

It is important that the person undertaking the assessment has the ability to determine whether the telecoms infrastructure and the use to which it is currently put still retains conformity with the conditions of its approval and design.

## 8 Appendix A Condition Assessment Summary.

### CONDITION ASSESSMENT SUMMARY (CAS) REPORT

|                 |                  |
|-----------------|------------------|
| Asset Assessed: |                  |
| Location:       |                  |
| Manufacturer:   | Model:           |
| Assessed by:    | Assessment Date: |

#### A - Issues Raised or Noticed

| Issue No. | Cat. | Description | Priority |
|-----------|------|-------------|----------|
|           |      |             |          |
|           |      |             |          |
|           |      |             |          |
|           |      |             |          |

(Categories: **S**=Safety, **M**=Maintenance, **P**=Performance, **O**=Other)  
(Priority: **H**=High, **M**=Medium, **L**=Low)

#### B – Actions undertaken on high priority items

| Issue No. | Action | Review date |
|-----------|--------|-------------|
|           |        |             |
|           |        |             |
|           |        |             |

#### C – Supporting Documentation for Assessment

| Item No. | Description or Reference to | Attached? |
|----------|-----------------------------|-----------|
|          |                             |           |
|          |                             |           |
|          |                             |           |

#### D – Estimated remaining life for asset

| < 1 Year                 | 2-5 Years                | > 5 Years                |
|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

## 9 Appendix B - Generic checklist

### GENERAL

#### G1 – How easy is the system to expand to meet future capacity requirements?

- ☐ Modular design, no limit to capacity
- ☐ System can be expanded within limits
- ☐ System incapable or difficult to expand

#### G2 – Is the system compliant with Railway Safety, Company and Industry Standards?

- ☐ No standard applicable to asset
- ☐ System fully compliant to current standard
- ☐ Non-compliant, compliance is not retrospective
- ☐ Non-compliant, derogation and action plan in place
- ☐ Non-compliant, standard forcing renewal

#### G3 – Is the system compliant with current legislation?

- ☐ System fully compliant to current legislation
- ☐ Non compliant but compliance is not retrospective
- ☐ Non compliant, standard legislation forcing renewal.

#### G4 – What is the current product approval status for the system?

- ☐ System has product approval
- ☐ System has a safety case product approval
- ☐ System currently in operational service without approval

#### G5 – Is the system compliant with Asset Policy Strategy?

- ☐ System fully compliant with current Asset Policy
- ☐ Non compliant with Asset Policy

#### G6 – Is the system affected by any Route Strategy?

- ☐ Not impacted by Route Strategy
- ☐ Renewal forced

Comments:

## MAINTAINABILITY

### M1 – Safe Accessibility

- ☐ No requirement to go lineside to access equipment
- ☐ Requirement to go lineside but within green zone
- ☐ Equipment short distance from access. green zone
- ☐ Protection arrangements required to access equipment
- ☐ Full possession required to access equipment

### M2 – Physical hazards (accessibility)

- ☐ No additional hazards identified
- ☐ Low risk, known hazards identified
- ☐ Medium risk, known hazards identified
- ☐ High risk, known hazards identified
- ☐ Unacceptable risk, known hazards identified

### M3 – Ergonomic issues with Maintenance

- ☐ Equipment easy to maintain, no manual handling
- ☐ Minor manual handling issues, no ladders required
- ☐ Minor manual handling issues, more than 1 man required
- ☐ Difficult manual handling issues, more than 1 man required
- ☐ Equipment un-maintainable

### M4 – Are spares readily available for the Equipment

- ☐ Abundance of spares. More than sufficient to support asset during its life
- ☐ Sufficient spares to support asset during its life nationally
- ☐ Limited spares available
- ☐ No spares available

### M5– Specialist tools availability

- ☐ Equipment does not require any specialist tools to carry out faulting and maintenance (F&M)
- ☐ Specialist tools required to carry out F&M, and maintainer has sufficient
- ☐ Specialist tools required to carry out F&M, maintainer does not have sufficient quantities, but they are readily available
- ☐ Specialist tools required to carry out F&M, maintainer does not have sufficient quantities, and difficult/expensive to source
- ☐ Specialist tools required to carry out F&M, maintainer does not have sufficient quantities, and they are unavailable

## M6 – Repairability of component parts

- ☐ All system parts still repairable
- ☐ Some parts non-repairable, but parts can be replaced with equivalent
- ☐ Equipment becoming less repairable, part difficult to source and likely issue with expected life of equipment
- ☐ Equipment becoming less repairable, part difficult to source and costs are excessive. Likely to be issue with expected life of equipment
- ☐ Equipment not repairable

## M7 – What are the current support arrangements with the system supplier?

- ☐ Equipment fully supported for period longer than remaining life
- ☐ Equipment supported for remaining life
- ☐ Equipment not supported but equipment easily replaced/faulted
- ☐ Equipment not supported. High risk of critical failure

## M8 – If there is specialist skills/competence required to maintain the system, what is the availability of this resource?

- ☐ Wide skillbase within maintenance organisation
- ☐ Acceptable within maintenance organisation
- ☐ Limited skill base giving resourcing difficulties
- ☐ Non-existent

## M9 – Maintenance Costs

- ☐ As expected
- ☐ Maintenance cost has increased but is now steady
- ☐ Increasing at an unacceptable rate

## M10 – How would you describe the condition of the as-built records?

- ☐ Records exist, are comprehensive and up to date
- ☐ Records exist but require minor changes
- ☐ Records exist but require major changes
- ☐ Records exist, are poor quality and require major changes
- ☐ No records exist

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### M11 – Is there a maintenance plan for the system?

- ☐ Asset is maintained under a maintenance plan compliant with Network Rail specifications and or Work Instructions or asset does not require maintenance.
- ☐ Asset is maintained through special arrangements outside of a maintenance plan
- ☐ Asset is not under any maintenance arrangement or has not to be maintained and this is causing the renewal to be brought forward.

Comments:

## OPERABILITY

### O1 – User Feedback

- ☐ No negative feedback from user
- ☐ Some negative feedback from user which can be modified at next maintenance visit
- ☐ Some negative feedback from user which can be modified at small additional cost
- ☐ Some negative feedback from user which can be modified at significant additional cost
- ☐ User displeased with equipment and modifications cannot be carried out

### O2 – User Ergonomics

- ☐ No negative feedback from user
- ☐ Some negative feedback from user which can be modified at next maintenance visit
- ☐ Some negative feedback from user which can be modified at small additional cost
- ☐ Some negative feedback from user which can be modified at significant additional cost
- ☐ User displeased with equipment and modifications cannot be carried out

### O3 – Operational Requirement

- ☐ Equipment more than meets operational requirement
- ☐ Equipment meets operational requirement
- ☐ Equipment does not meet operational requirements but can be modified at small cost
- ☐ Equipment does not meet operational requirements but can be modified at large cost
- ☐ Equipment does not meet operational and cannot be modified

### O4 – Impact to user of failure

- ☐ No impact, user can still operate without asset
- ☐ Small impact, user needs an alternative method of working
- ☐ Small impact, alternative method likely to lead to additional cost
- ☐ Medium impact, alternative method likely to lead to large additional cost
- ☐ Operator cannot operate on failure or cost of alternative unreasonable

Comments:

.....

## 10 Appendix C - Concentrator checklist

### CONDITION

#### C1 – What is the general condition of the control equipment?

- ☐ Excellent - e.g. excellent asset condition with no obvious concerns affecting the reliability of the control equipment
- ☐ Acceptable - e.g. acceptable asset condition with minor shortfalls which do not significantly affect the reliability of the control equipment
- ☐ Unacceptable - e.g. unacceptable asset condition with significant shortfalls which may significantly affect the reliability of the control equipment

#### C2 - What is the general condition of the tie cabling between the control equipment and the operators MMI?

- ☐ Excellent - e.g. excellent asset condition with no obvious concerns affecting the reliability of the equipment
- ☐ Acceptable - e.g. acceptable asset condition with minor shortfalls which do not significantly affect the reliability of the equipment
- ☐ Unacceptable - e.g. unacceptable asset condition with significant shortfalls which may significantly affect the reliability of the equipment

#### C3 – What is the general condition of the tie cabling between the control equipment and the NTP?

- ☐ Excellent - e.g. excellent asset condition with no obvious concerns affecting the reliability of the equipment
- ☐ Acceptable - e.g. acceptable asset condition with minor shortfalls which do not significantly affect the reliability of the equipment
- ☐ Unacceptable - e.g. unacceptable asset condition with significant shortfalls which may significantly affect the reliability of the equipment

#### C4 – How would you describe the operating environment of the telephone concentrator control equipment? (Consider physical conditions, temperature and security)

- ☐ Excellent - e.g. excellent environmental conditions with no obvious concerns affecting the reliability of the control equipment
- ☐ Acceptable - e.g. acceptable environmental conditions with minor shortfalls which do not significantly affect the reliability of the control equipment
- ☐ Unacceptable - e.g. unacceptable environmental conditions with significant shortfalls which may significantly affect the reliability of the control equipment

## C5 – What is the general condition of the Operators MMI?

- ☐ Excellent - e.g. excellent asset condition with no obvious concerns
- ☐ Acceptable - e.g. acceptable asset condition with minor shortfalls
- ☐ Unacceptable - e.g. unacceptable asset condition with significant

## C6 – What is the general condition of the labelling

- ☐ Excellent - e.g. excellent asset condition with no obvious concerns
- ☐ Acceptable - e.g. acceptable asset condition with minor shortfalls
- ☐ Unacceptable - e.g. unacceptable asset condition with significant

Comments:

## RELIABILITY

### R1 – Which equipment is exhibiting high failure rates within the system?

- ☐ Operators MMI
- ☐ Control equipment
- ☐ Power supplies including batteries.
- ☐ Ring tone generators
- ☐ Line interfaces
- ☐ No equipment exhibiting high failure rate

## R2 – What failure modes are affecting system reliability?

- ☐ Operators MMI: Failure of handset
- ☐ Operators MMI: Failure of keyboards
- ☐ Operators MMI: Failure of lamps
- ☐ Operators MMI: Failure of audible alert(s)
- ☐ Control Equipment: Misrouting of calls
- ☐ Control Equipment: Loss of confidence tones
- ☐ Control Equipment: Crosstalk
- ☐ Control Equipment: Software failure
- ☐ Loss of main & standby power
- ☐ Lineside telephony
- ☐ Lineside cabling / bearer
- ☐ No failure modes
- ☐ Other – Please specify:

## R3 – Impact to the business of failure

- ☐ None
- ☐ Low
- ☐ Medium
- ☐ High
- ☐ Catastrophic

Comments

## R4 – Have there been any incidences of equipment failure for a prolonged period?

- ☐ No incidence of any equipment being un-maintainable
- ☐ Low incidence of <2 events per annum
- ☐ Low to medium, between 3-5 events per annum
- ☐ Medium to high, between 6-10 events per annum
- ☐ High incidence > 10 events per annum

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#### R5 – Overall Failure Rate (last two years)?

- ☐ Less than expected
- ☐ Expected failure rate
- ☐ More than expected

#### R6 - SRTF Impact (highest)?

- ☐ Negligible
- ☐ Low
- ☐ Medium
- ☐ High
- ☐ Unacceptable

Comments from user on reliability of equipment:-

.....