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Issue:	8
Date:	07 March 2015
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Level 2

Process for the implementation of new or revised maintenance regimes using Reliability Centred Maintenance

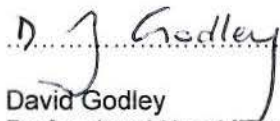
Endorsement and Authorisation

Endorsed by:



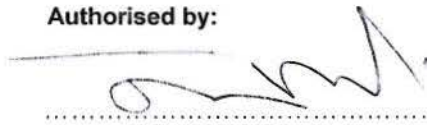
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Issue record

Issue	Date	Comments
	Month Year	
1	Dec 2000	New specification detailing the process for the introduction of new or revised maintenance regimes.
2	May 2004	Specification updated to incorporate knowledge gained from the Risk Based Maintenance project.
3	Oct 2006	Standard completely rewritten in light of a review of Risk Based Maintenance and a decision to use a different analysis process. Includes simplified processes for amendment of SMSs
4	June 2008	Revised to reflect new organisation structure.
5	Mar 2011	Rewritten to incorporate other disciplines. Change of cross reference to incorporate the creation of NR/L3/SIG/10665 for signalling maintenance schedules.
6	Sept 2011	Maintenance of document, no change to requirements
7	February 2014	(CCMS document number 61346134) Updated to support application to other disciplines under devolution, training requirements and asset information requirements.
8	March 2015	Updated to include Appendix A covering Track Risk Based Maintenance process.

Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors from 04 May 2015.

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

Moubray, J,	Reliability Centred Maintenance (2nd ed) 1997, Elsevier ISBN 978-0-7506-3358-1
SAE JA1011	Evaluation Criteria for Reliability-Centred Maintenance (RCM) Processes

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1 Purpose

This standard specifies the minimum requirements for the development and implementation of new or revised maintenance regimes developed using Reliability Centred Maintenance analysis techniques.

2 Scope

This standard is applicable to the development, implementation and revision of new maintenance regimes developed using Reliability Centred Maintenance analysis techniques for existing or new assets in the following disciplines:

- a) Signalling;
- b) Telecoms;
- c) Track;
- d) Electrical Power.

3 Roles and responsibilities

Analysis maintenance management system expert/Analysis Ellipse expert

Able to identify the changes needed in the maintenance management system to allow the new maintenance regime to be implemented.

NOTE In the majority of cases the maintenance management system will be Ellipse.

Asset owner

The post responsible for the asset and for determining what maintenance, modification and renewal activities are undertaken.

Delivery Administrator

Sets up workshops (non technical aspects).

Delivery Manager

Manages requests for analyses, the allocation of Facilitators and escalates requests for participation of individuals in workshops.

Director, Route Asset Management

Accountable for managing route data set.

Facilitator - mentoring

A highly experienced Facilitator who is certified as being capable of mentoring and assessing the competence of new Facilitators.

Facilitator - not yet competent

An engineer or maintenance specialist in a specific discipline trained but not yet certified as competent to Facilitator level in RCM and working for >50% of their time on RCM initiatives. Working within their own discipline so can be assumed to have a good understanding of the relevant standards, the assets and the maintenance practices.

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Facilitator - working in own discipline

An engineer or maintenance specialist in a specific discipline trained and certified as competent to Facilitator level in RCM and working for >50% of their time on RCM initiatives. Working within their own discipline so can be assumed to have a good understanding of the relevant standards, the assets and the maintenance practices.

Facilitator - working off-discipline

An engineer or maintenance specialist in a specific discipline trained and certified as competent to Facilitator level in RCM and working for >50% of their time on RCM initiatives. Working in a different discipline so may not have the required knowledge of standards, assets and maintenance practices. They must be supported by an analysis technical support Engineer.

Implementation Briefer

Briefs the maintainers on the RCM process and the specific changes needed for an asset type.

Implementation Engineer

Responsible for the implementation process for a specific area at Route/DU.

Implementation Project Manager

Undertakes implementation process for a specific area at Route/DU.

Local Maintenance Management System Team

The team who manage the maintenance management system (typically Ellipse).

Maintainers

The individuals who undertake physical inspection, servicing and maintenance activities on an asset.

Process Assurance Manager

Manages the assurance process used to ensure the delivery of a compliant RCM analysis process. Defines the RCM specific elements of verification audits etc. to confirm correct application of RCM based regimes on individual assets. Manages the competence of Facilitators. Maintains the register of authorised analyses.

Route Asset Manager

Reference to this role refers to Route Asset Manager (Discipline) or National Telecoms Assurance & Performance Manager.

RCM trainer

An expert in RCM certified as a trainer by an RCM training body deemed competent by Network Rail.

RCM Reviewer

An RCM specialist who has not taken part in the analysis. Conducts a detailed review of the analysis and process to identify any incomplete or incorrect areas. Recommends acceptance to the regime endorser.

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Regime Authoriser

Authorises the publication of the new regime.

Regime Endorser

Confirms the technical sustainability of the new regime to the regime authoriser.

Regime Proposer

Produces the authorisation proposal, based on the analysis provided by the Facilitator, and proposes its acceptance to the Endorser and Authoriser.

Technical Reviewer

An asset specialist who has not taken part in the analysis. Conducts a detailed review of the analysis to identify any ambiguous, missing or erroneous information. Recommends acceptance to the regime endorser.

Workshop Expert Participant

An individual who has knowledge of a specific area of the asset; generally these people will have limited involvement in the analysis so should be familiar with the RCM process but do not necessarily need to be skilled in RCM.

Workshop Information Support

Enters information into the RCM software during the workshop. Also should have ready access to standards etc.

Workshop participant

An individual skilled in RCM who has asset specific knowledge.

4 Definitions

For the purpose of this standard, the following terms and definitions apply.

Adaptation analysis

An analysis which is based on an authorised analysis for an asset with a similar design or an identical design of asset with a similar operating context.

Analysis

The application of the RCM and supporting processes needed to publish a new maintenance regime.

Application criteria

The criteria used to identify the correct maintenance for an asset.

NOTE for example how maintenance differs based on condition, usage, environment or configuration.

Asset

An individual asset, component, group of components or system against which maintenance is scheduled.

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Asset Information

The organisation within Network Rail responsible for providing trusted sources of asset-related information.

Asset Information Specification (AIS)

The specification that defines the current and foreseeable information requirements, for a specific asset group, to deliver a business objective, e.g. RCM considering internal and external stakeholder needs. The information requirements are viewed from 8 perspectives or layers of 'what', 'where', 'condition', 'work', 'capability', 'utilisation', 'performance' and 'cost'.

Asset Knowledge Standards

Standards and guidelines used to evaluate and define the AIS across each of the information layers, e.g. the Signalling Maintenance Specification is used to define 'work'.

Asset type

A design of asset.

Comparison 'snap' chart

A document which maps the RCM analysis against the tasks within the existing and new maintenance specifications. Its purpose is to ensure completeness of the new maintenance spec and to identify any significant omissions in the new or existing regime.

Condition standards

Standards that define how the condition of assets are assessed or measured.

Cross-discipline

An asset or risk which affects more than one discipline.

NOTE an example would be S&C which has track, signalling and plant elements. Another example would be an assumption that a specific risk is addressed by another discipline.

Data Governance Change Control Board

The Data Governance Change Control Board is responsible for confirming that asset data within Network Rail is managed consistently and in line with the strategic objectives of investments in tools and processes for managing data. This board is managed by the Data Specification Team.

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Data Quality

This is a series of absolute measures that describes a state of Network Rail's data. The data profiling techniques that comprise the data quality measures, listed below, are in line with Institute of Asset Management (IAM) and Data Management Association (DAMA):

- a) Completeness;
- b) Consistency;
- c) Uniqueness;
- d) Accessibility;
- e) Validity;
- f) Accuracy;
- g) Integrity.

Data Specification Team

Team within Data Management, which is a department under Asset Information responsible for the management of Asset Information Specifications.

FIFI

Failure finding interval (RCM term).

Impact Assessment Group

The purpose of the group is to ensure that asset data change requests for systems are reviewed in relation to their impact on cost, safety and performance and establish the overall benefit in line with the company goal of providing a more efficient and safe railway. The activities of this group are managed by the Data Specification Team.

Implementation

Uses the published maintenance regime to determine and apply the correct maintenance for an individual asset.

interim solution

A regime issued part way through the analysis which applies to a sub group of the assets under consideration.

NOTE typically this will be delivered when the time taken to undertake follow up work will be lengthy

Maintenance

Any routine activity undertaken to confirm that an asset continues to meet the business need in its operating context. Colloquially this may be termed 'inspection', 'servicing', 'maintenance' or renewal.

Maintenance Management System

The system used for managing the planning of and compliance with maintenance requirements.

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NOTE for most infrastructure disciplines this is Ellipse

Maintenance regime

The application criteria, tasks and frequencies for an asset type (or sub type).

Maintenance specification

The maintenance tasks as presented to maintainers.

MMS

Maintenance management system (typically Ellipse).

Operating context

The operating context defines the environment in which the asset is required to operate.

NOTE Its exact content will vary but typically it will include the purpose of the asset and its configuration (i.e. presence of redundancy)

PF Interval

RCM terminology – the interval between an impending failure becoming detectable by the monitoring method being used (point P – Potential failure) and the functional failure (point F) at which the asset can no longer meet the functionality required of it.

RBM

Risk-Based Maintenance.

RCM Software

Software used by NR to undertake and record the RCM analysis.

Register of Authorised Analyses

A central register of authorised analyses, maintained by the Process Assurance Manager, which should be checked for suitable analyses for adoption or adaptation before any new analysis is undertaken.

Reliability Centred Maintenance (RCM)

An established process which defines what maintenance is needed in order to allow an asset to meet the business need within a specific operating context.

Scope and operating context (SOC)

A document which defines the physical, control and electrical boundaries of the analysis, key assumptions, and the operating context against which the analysis will be conducted.

TNC

Temporary non compliance.

Template Track Analysis (TTA)

A document which describes the functions, functional failures and failure modes for the plain line track system and constituent elements, with supporting effects and information to enable a robust and efficient RBM analysis to be carried out.