NR/SIG/10665/Mod 001
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Module 001

Reliability Centred Maintenance of Signalling Equipment (ROSE) – Criteria and Frequencies

Endorsement and Authorisation

For endorsement and authorisation, please refer to NR/SIG/10665

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User information

This Network Rail standard contains colour-coding according to the following Red–Amber–Green classification.

Red requirements – *No variations, could stop the railway*

- **Red requirements shall** always be complied with and achieved.
- Red requirements shall be presented in a red box with the word “shall” or expressed as a direct instruction.
- Accountability for the efficacy of red requirements lies with the Professional Head/Standard Owner.
- Red requirements are monitored for compliance.
- Corrective actions shall be enforced if deviations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Amber requirements – *Controlled variations, approved risk analysis and mitigation*

- **Amber requirements shall** be complied with unless variation has been approved in advance.
- Amber requirements shall be presented with an amber sidebar and with the word “shall” or expressed as a direct instruction.
- Accountability for the efficacy of these requirements lies with the Professional Head/Standard Owner, or their nominated Delegated Authority.
- Amber requirements are monitored for compliance.
- Variations **may** be permitted. Variations are approved by the Standard Owner or through existing Delegated Authority arrangements.
- Corrective actions shall be enforced if **non-approved** variations are discovered through functional checks (e.g. engineering verification visits, audit or Operations Self-Assurance).

Green – *Guidance*

- Guidance is based on good practice. Guidance represents supporting information to help achieve Red and Amber requirements.
- Guidance shall be presented with a dotted green sidebar and with the word “should” (usually in notes) or as a direct instruction.
- Guidance is **not mandatory** and is not monitored for compliance.
- Alternative solutions may be used. Alternative solutions do not need to be formally approved.
- Decisions made by a competent person to use alternative solutions should be backed up by appropriate evidence or documentation.

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1 Tasks and Tests Undertaken to NR/ROSE Periodicity

This section contains the details of tasks and tests which are undertaken to a NR/SMS specification but to a NR/ROSE frequency

1.1 AWS Permanent and Electro-Magnets (incl PSR Permanent Magnets)

A new revised ROSE regime has been introduced as part of an ongoing process of review and improvement.

At present DUs may chose to remain on the existing ROSE regime of annual maintenance or may move to the revised ROSE regime outlined below

Maintenance Specification (Basic)	**NR/SMS/AW11 and NR/SMS/Test/024**
Scope	The regime change applies to AWS Permanent, Electro and Suppressor Magnets, PSR Permanent Magnets maintained by signalling teams.
Exclusions	This does not apply to AWS magnets which are known to have security problems (i.e. where sleepers are rotten) or which have a history of being damaged by train mounted equipment
Changes	Generally the A service can be conducted at 52 weekly intervals.
Prerequisites	None

Extended ROSE Maintenance Specification	**Removal of NR/SMS/AW11 and NR/SMS/Test/024**
Scope	The regime change applies to AWS Permanent, Electro and Suppressor Magnets, PSR Permanent Magnets maintained by signalling teams.
Changes	Maintenance of AWS may now be Condition Based, where routine maintenance is withdrawn if the asset meets the Prerequisites below. If the asset condition changes maintenance must be reintroduced or the asset condition improved.
Exclusions	This does not apply to AWS magnets which are known to have security problems (i.e. where sleepers are rotten) or which have a history of being damaged by train mounted equipment. These continue to require maintenance.
Prerequisites	Before moving any AWS to the revised Rose regime, the cable entry gland and termination box lid seal shall be effective. Any defects shall be corrected before implementation. If practical, an dynamic earth reading should be recorded on the AWS record card. Subsequent dynamic earth checks on the supply will indicate any deteration in the electro-magnet

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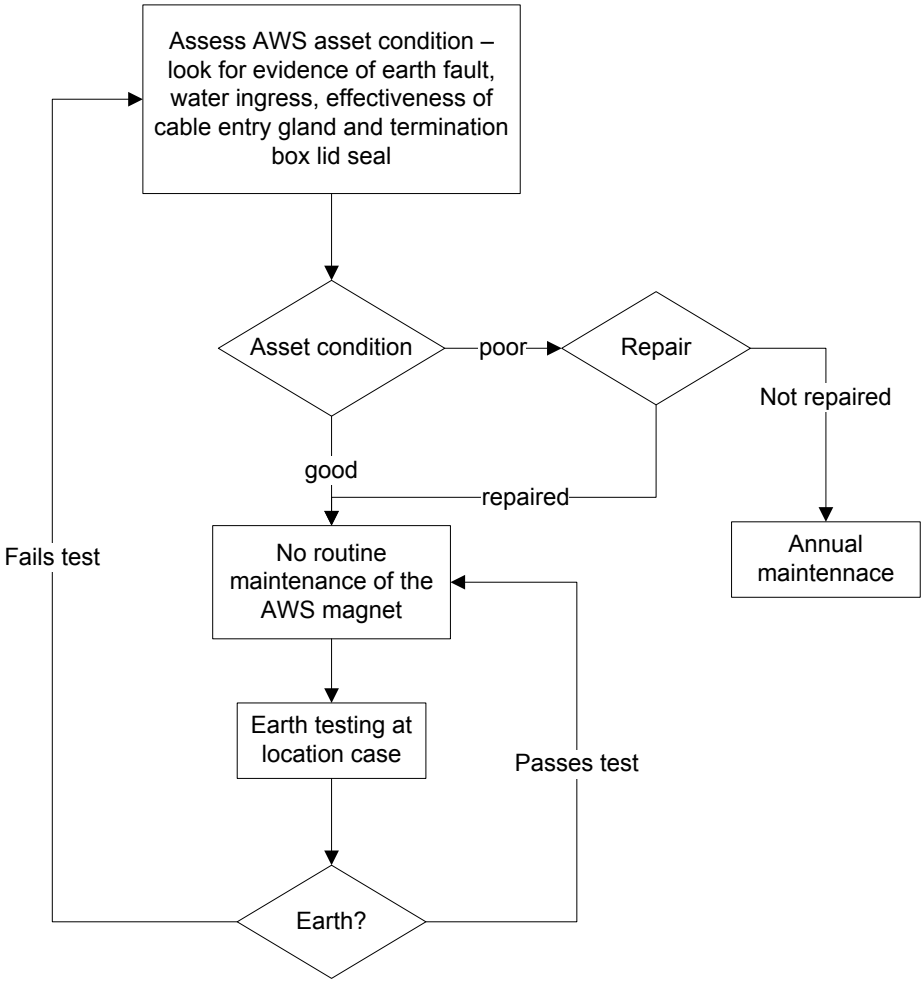

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1.2 DC Track Circuits

1.2.1 Medium Voltage

These NR/ROSE amendments only apply to the TCs detailed in the scope.

Maintenance Specification	**NR/SMS/TC01, NR/SMS/Test/251 and NR/ROSE/TC-A3/1** See NR/SIG/10665/Mod 033
Scope	The regime change applies to • standard AC-immune DC track circuits with non-adjustable feedsets (medium voltage) as defined in NR/L2/SIG/11755 section 4.2.1. • BR904 feedsets • Westatic R4/R4B feedsets

Application Criteria

Regime	AC-immune DC track circuits	No Un-staggered IRJs	Modified NT2A Track Relay	Residual voltage check required
Non RCM	N/A	N/A	No	No
Basic & Extended RCM	Yes	Yes	Yes	Yes

Explanation of above table

Requirements	Explanation
AC-immune DC track circuits	AC-immune DC track circuits with non-adjustable feed sets (medium voltage) as defined in NR/L2/SIG/11755
Un-staggered IRJs	Un-staggered joints in the context of this standard are insulated rail joints that maintain electrical separation between two abutting sections of running rail that are of the same polarity
Modified NT2A Track Relay	Any track circuit fitted with NT2A type track relays that have not been modified with a Domed Residual Pin and be labelled ‘Domed Residual Pin Fitted’

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Residual voltage check – Basic regime Extended regime – there is no requirement to carry out a further residual voltage check if it is recorded that there is no residual voltage present	Each track circuit that that does not have a feed end relay, shall at the earliest opportunity undergo a residual voltage check in accordance with step 3 of NR/SMS/Test/251. If <30% of the minimum drop away voltage cannot be achieved, the track circuit should be excluded from this change and the reasons behind the residual voltage values be investigated.

Maintenance Frequencies

Regime	Track circuit SMS		
	TC01A	TC01B	TC-A3/1
Non RCM	13 Weekly	52 weekly	NA
Current RCM	26 Weekly	52 weekly	NA
Extended RCM	NA	NA	52 weekly

1.2.2 Low Voltage (Primary cell fed)

Maintenance Specification	NR/SMS/TC01 and NR/SMS/Test/251
Scope	The regime change applies to **Primary Cell** Low Voltage DC Track Circuits with a track relay with an operating coil of at least 9 ohms resistance, as defined in NR/L2/SIG/11755 section 4.2.1
Changes	Generally the A service can be conducted at 26 weekly intervals
Primary Cells	It is recommended that on the annual 'B' service the primary cells are replaced. To maintain reliability using this replacement frequency, the capacity of the cells used should be based on the service frequency, and the time the track circuit is in an occupied state. There are two versions of cells which should be used • AS10/1 600Ah (cat no. 54/003198) for low use track circuits and • AS10/2 1200 Ah (cat no. 54/003199) for heavily used track circuits

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Exclusions	Any Track circuit with a track relay with an operating coil of at less than 9 ohms resistance Any track circuits that contain any insulated rail joints (IRJ's) listed below shall be excluded from the pilot: • Un-staggered IRJs (Un-staggered joints in the context of this document are insulated rail joints that maintain electrical separation • between two abutting sections of running rail that are of the same polarity. In this situation, if the insulated rail joint fails there is a risk that the feed of one track circuit will operate the • relay of the abutting track circuit, even when the abutting track circuit feed is shunted by the wheels of a rail vehicle.') • (ii) Any joint that abuts a different type of DC track circuit • (iii) Any joint at the end of traction immunised railway • This list is not exhaustive and other joints may warrant special • consideration due to performance or safety issues. Other types of LV DC track circuits.- work is underway on LV DC TCs which use secondary cells
Prerequisites	Each track circuit that that does not have a feed end relay, shall at the earliest opportunity, undergo a residual voltage check in accordance with step 3 of NR/SMS/Test/251. If <30% of the minimum drop away voltage cannot be achieved, the track circuit should be excluded from this change and the reasons behind the residual voltage values be investigated.

1.3 Disconnection Boxes

Disconnection Box maintenance is currently included within NR/SMS/EL21. With the introduction of new frequencies for ROSE assets, this can lead to the situation where the disconnection box is maintained more frequently than the equipment associated with it. Disconnection boxes associated with ROSE assets should be maintained at the same frequency as the asset.

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1.4 Location Cases or Portable Equipment Rooms (double cut lineside circuits or SSI)

The scope is extend to include Portable Equipment Rooms.

The change in maintenance frequency from 26 weeks to 52 weeks for those Location Cases & Portable Equipment Rooms that meet the extended selection criteria.

Maintenance Specification	**NR/SMS/EL21, NR/SMS/EL31 and associated tests**
Scope	The regime applies to • double cut line-side circuits location cases or PER with SSI
Changes	If the location case contains cable terminations only (there is no functional equipment, busbars, ELD, or batteries therefore sections 3 to 8 of EL21do not apply) then sections 1 and 2 of the SMS may be undertaken as a Service B along with sections 10, 11, and 12.
Exclusions	Ansaldo Location cases (used on the Manchester South Scheme)

1.4.1 Application Criteria

	Requirements					
	Double Cut Ccts or SSI	Wire Degradation (Normal or Fair)	Good Cable Condition/ History	ONLY approved maintenance free secondary cells allowed such as Alcad Vantage, M ranges EnerSys Cyclon etc.	Newly installed <5 years old	Installed >=5 years or of unknown age
					Or	
Non RCM	No	No	No	No	No	No
Basic RCM	Yes	Yes	Yes	Yes	No	No
Extended RCM	Yes	Yes	Yes	Yes	No outstanding commissioning defects	Site visit must indicate good condition

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1.4.2 Explanation of above table

Requirements	Explanation
Double Cut Ccts or SSI	The regime applies to location cases and Portable Equipment Rooms with either double cut line-side circuits or SSI
Wire Degradation (Normal or Fair)	The location case or PER shall not have a wire degradation class of poor, severe or extreme (as per NR/L2/SIG/11655)
Good Cable Condition/ History	The location case or PER shall not have a poor cable condition/history of cable failure (see Important Information & Appendix G)
ONLY approved maintenance free secondary cells allowed such as Alcad Vantage, M ranges EnerSys Cyclon etc.	Location Cases or PER shall not contain any of the following - wet cell batteries of the older Lead Acid or unsealed NiCad types (Batteries)
Newly installed <5 years old	See Appendix E (Application flowchart)
Installed >=5 years or of unknown age	

1.4.3 Data Loggers Contained within Location Case or PER

Data Loggers which are not remotely monitored need to be maintained at their current frequency. Generally, remotely monitored loggers can be maintained at the same frequency as the location case or PER

1.4.4 Changes to frequencies

Regime	Location Cases		Portable Equipment Rooms	
	EL21A	EL21B	EL31A	EL31B
Non RCM	13 Weekly	52 weekly	13 Weekly	52 weekly
Basic RCM	26 Weekly	52 weekly	26 Weekly	52 weekly
Extended RCM	52 weekly	52 weekly	52 weekly	52 weekly

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