Ref:	NR/L3/SIG/10661
Issue:	25
Date:	02 December 2023
Compliance date:	02 March 2024

Level 3

Work Instruction

Signalling Maintenance Task Intervals

Technical Instruction

Issue date: 4th September 2023
Compliance date: 29th September 2023
Expiry date: 29th September 2025

Technical Instruction TI 184 is attached to this standard/control document.

This Technical Instruction mitigates an urgent safety/asset/equipment risk that cannot await a full review of this standard/control document.

This standard/control document will be reviewed and reissued before the emergency change expires on 29th September 2025.

Jerry Morling

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NetworkRail

User information

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

Red requirements – *no variations permitted*

- Red requirements are to be complied with and achieved at all times.
- Red requirements are presented in a red box.
- Red requirements are monitored for compliance.
- Non-compliances will be investigated and corrective actions enforced.

Amber requirements – *variations permitted subject to approved risk analysis and mitigation*

- Amber requirements are to be complied with unless an approved variation is in place.
- Amber requirements are presented with an amber sidebar.
- Amber requirements are monitored for compliance.
- Variations can only be approved through the national variations process.
- Non-approved variations will be investigated and corrective actions enforced.

Green guidance – *to be used unless alternative solutions are followed*

- Guidance should be followed unless an alternative solution produces a better result.
- Guidance is presented with a dotted green sidebar.
- Guidance is not monitored for compliance.
- Alternative solutions should be documented to demonstrate effective control.

Compliance

This Network Rail standard/control document is mandatory and shall be complied with by Network Rail Infrastructure Limited and its contractors if applicable from 2nd March 2024.

Where it is considered not reasonably practicable[1] to comply with the requirements in this standard/control document, permission to comply with a specified alternative should be sought in accordance with the Network Rail standards and controls process, or with the Railway Group Standards Code if applicable.

If this standard/control document contains requirements that are designed to demonstrate compliance with legislation they shall be complied with irrespective of a project's Project Acceleration in a Controlled Environment (PACE) phase or equivalent governance framework. In all other circumstances, projects that have formally completed PACE strategic development & project selection phase may continue to comply with any relevant Network Rail standards/control documents that were current when PACE phase 1 was completed.

NOTE 1: *Legislation includes National Technical Specification Notices (NTSNs)*

NOTE 2: *The relationship of this standard/control document with legislation and/or external standards is described in the purpose of this standard.*

NOTE 3: *For more information on PACE see NR/L2/P3M/201.*

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[1] *This can include gross proportionate project costs with the agreement of the Network Rail Assurance Panel (NRAP).*

Issue record

Issue	Date	Comments
20	December 2020	Updated for Dec 2020 SMS updates
21	September 2021	Updated for Sept 2021 SMS updates. SG04-A service max amended to 0364. TC03-PT, IF01 PT added and IF03 RT2 removed. EL34-D amended to 3640.SG01-B added.
22	December 2021	Updated for Dec 2021 SMS updates. SG03 RB service removed, PF06 removed. The maximum intervals of the following services have been amended by the PMR Project. AX12 A, AX28 A, AX29 A, SG02, SG08, SG11 R1 & R2, SG13, SG14 A & B, SG15 R2 & R3, SG16 R1, SG17 R1, SG18 A & B, SG19 R1 & R2, TC03 RA RB, TC04 A B TC08 R1 & R2 and TC12 RE. SG14 R1 has been removed and is replaced by the New SG21 PT. A new Service A has been added to TC30 and the intervals amended.
23	June 2022	Updated for June 2022 SMS updates.
24	June 2023	Amended MSTs and withdrawal of TI 180.
25	December 2023	Additional MST frequencies added to support new maintenance schedules. Services moved to FoF as part of Eastern RAG work.

Legislation

No legislation has been identified that is applicable to the content of this standard/control document.

Contents

1 Purpose 6
2 Scope 6
3 Definitions 6
4 Signal Maintenance Specification Application 7
4.1 General Requirements 7
4.2 Where no Maintenance Specification Exists 8
4.3 Scheduled Maintenance 8
4.3.1 Early Maintenance 8
4.3.2 Late Maintenance 8
4.3.3 Missed Maintenance 9
5 Reliability Centred Maintenance of Signalling Equipment (RoSE) 10
6 Task Intervals 10
6.1 NR/SMS/Part/C 10
6.2 NR/SMS/Part/D 29
6.3 NR/SMS/Part/E 29
6.4 NR/SMS/Part/T 30
6.5 NR/L2/SIG/11655 – Management of Cable and Wire Insulation 31

1 Purpose

The purpose of this document is to set the safety and performance intervals applicable for carrying out signalling maintenance tasks and tests.
The intervals shown are intended to maintain the designed safety and reliability, by detecting and correcting deficiencies to signalling equipment before there is deterioration or failure.

2 Scope

This document applies to all staff that perform preventative or corrective maintenance to signalling assets on Network Rail managed infrastructure.
The intervals relate to the maintenance tasks defined in the Signal Maintenance Specifications, or that need to be applied for Reliability-Centred Maintenance.

3 Definitions

Terms and abbreviations used in this document are described in Table 1 and Table 2 respectively.

Term	Definition
Interval	The time between applications of a maintenance task.
Maintenance Task	The individual task which is carried out in order to achieve the required level of safety and reliability whilst optimising the useful working life of an item of infrastructure.
Maximum Interval between services	The maximum interval between services that Network Rail can currently justify.
Normal Interval between services	The standard interval between services that meets most requirements.

Table 1 - Definitions

Abbreviation	Description
RAM[S]	Route Asset Manager [Signalling]
S&TME	Signal and Telecoms Maintenance Engineer
SMS	Signal Maintenance Specification
RoSE	Reliability Centred Maintenance of Signalling Equipment
FoF	Fix on Failure - Maintenance can be removed from the asset when any required prerequisites are met and any additional requirements are in place. Maintenance can still be scheduled against an asset based on condition and engineers' discretion.
DS	Daily Service
RS	Regular Service
RT	Regular Test
RC	Regular Checks
PT	Periodic Tasks
RA	Service A carried out at RoSE frequency
RB	Service B carried out at RoSE frequency
RE	Additional prerequisites detailed in NR/L3/SIG/10665, which allow the associated service to be extended further as detailed by the frequencies below
R1 or R2	RoSE Services to be used where specified in NR/L3/SIG/10665
V1	Visual checks

Table 2 - Abbreviations

4 Signal Maintenance Specification Application

4.1 General Requirements

The intervals currently being applied shall continue until an application to change is made and approved as per the process detailed in Appendix A.

If due to local variation or historical reasons, an existing maintenance task interval is being applied which exceeds the maximum interval documented below, the interval shall be reduced to the maximum interval.

Any existing maintenance task interval which is currently applied at less than the maximum task interval shall be advised to the Professional Head (Signalling). No scheduled maintenance interval shall exceed the stated maximum interval unless a documented risk assessment indicates that it is safe to do so.

Normal interval frequency can be increased to improve performance or reliability.

The Signal and Telecoms Maintenance Engineer (S&TME) shall arrange that Ellipse is adequately controlled to manage the required maintenance at the agreed intervals.

4.2 Where no Maintenance Specification Exists

Where equipment exists and there is no Signal Maintenance Specification (SMS), the S&TME shall inform the Route Asset Manager [Signalling] (RAM[S]).

Where the equipment is yet to be handed back to maintenance, the equipment shall not be handed over until a suitable maintenance schedule is provided or it can be demonstrated that maintenance is not required.

For equipment, which is under the control of the maintenance organisation, the S&TME shall create a maintenance instruction to manage the equipment and this shall be forwarded to the Professional Head (signalling) for review and inclusion in the Signal Maintenance Specifications.

The S&TME can use an existing SMS to derive this maintenance instruction or derive it from the manufacturer or supplier.

4.3 Scheduled Maintenance

4.3.1 Early Maintenance

Maintenance shall be permitted to be undertaken 'early', provided this is within one week of the scheduled maintenance for 'weekly', 'monthly', '6 weekly' and '3 monthly' services. Longer interval services shall be permitted to be undertaken 'early' within one month of scheduled service.

Interval	Daily	Weekly	Monthly	6 Weekly	3 Monthly	6 Monthly	Annual & Above
Early	N/A	Up to - 1 week	Up to - 1 week	Up to - 1 week	Up to - 1 week	Up to - 1 month	Up to - 1 month

Table 3 - Early Maintenance

4.3.2 Late Maintenance

Scheduled maintenance services that are not fully completed by the scheduled day, shall be to be classed as 'late maintenance'.

'Late maintenance' shall be reprogrammed as follows:

- Within 100% of the scheduled maintenance interval for 'daily' or 'weekly' tasks.
- Within 50% of the scheduled maintenance interval for 'monthly' or '6 weekly' tasks.
- Within 25% of the scheduled maintenance interval for all other maintenance intervals.

Where it is not possible to complete maintenance, services scheduled monthly and longer by the end of the 'late maintenance' period the S&TME shall produce a documented risk assessment for each service.

The risk assessment shall consider the maintenance history of that item, its failure rate, and any safety hazards that might be introduced by deferring the service.

If the risk assessment indicates that safety is compromised, the maintenance shall be completed, or further mitigations applied without further delay.

An example risk assessment template is contained in Appendix B.

Interval	Daily	Weekly	Monthly	6 Weekly	3 Monthly	6 Monthly	Annual & Above
Late	< +100% Interval - - - - - - < = + 1 day	< +100% Interval - - - - - - < = +1 week	< +50% Interval - - - - - - - < = + 2 weeks	< +50% Interval - - - - - - < = + 3 weeks	< +25% Interval - - - - - - < =+ 3 weeks	< +25% Interval - - - - - - < = + 6 weeks	< +25% Interval - - - - - - < = + 3 months

Table 4 - Late Maintenance

4.3.3 Missed Maintenance

Any maintenance not fully completed by the end of the late period described in 4.3.2 shall be classed as 'missed maintenance'.

The S&TME shall keep records of 'missed maintenance' services.

Any 'missed maintenance' services which are cancelled shall be reported to the RAM[S] along with the supporting risk assessment.

Missed maintenance' shall be reprogrammed as follows:

- 100% of the scheduled maintenance interval for 'daily' or 'weekly' tasks.
- 50% of the scheduled maintenance interval for 'monthly' and '6 weekly' tasks.
- 25% of the scheduled maintenance interval for all other maintenance tasks.

Interval	Daily	Weekly	Monthly	6 Weekly	3 Monthly	6 Monthly	Annual & Above
Missed	> +100% Interval - - - - - - - > + 1 day	> +100% Interval - - - - - - - > + 1 week	> +50% Interval - - - - - - - > + 2 weeks	> +50% Interval - - - - - - - > + 3 weeks	> +25% Interval - - - - - - - > + 3 weeks	> +25% Interval - - - - - - - > + 6 weeks	> +25% Interval - - - - - - - > + 3 months

Table 1 – Missed Maintenance

Missed maintenance shall be caught up.

Services indicated with a (*) in table in 6.1 shall not be cancelled.

In exceptional circumstances services scheduled between one and 3 monthly can be cancelled completely (i.e. service deferred until the next scheduled service) where the risk assessment indicates it is safe to do so.

A risk assessment is not required to cancel services which are scheduled less than monthly (ie, Daily or Weekly services).

Two consecutive weekly or longer interval services shall not be 'missed' or cancelled.

Services scheduled '6 monthly' and longer shall not be cancelled. Where the risk assessment indicates it is safe to do so, the longer services can be further deferred up to a total of 50% of the scheduled interval.

Interval	**Daily, Weekly, Monthly and 6 Weekly**	**3 Monthly**	**3 Monthly (*) Services**	**6 Monthly**	**Annual & Above**
Missed After Risk Assessment	Cancel Complete	Cancel Complete	< +50% Interval - - - - - - - < + 6 weeks	< +50% Interval - - - - - - - < + 3 months	< +50% Interval - - - - - - - < + 6 months

Table 2 – Missed After Risk Assessment

5 Reliability Centred Maintenance of Signalling Equipment (RoSE)

NR/L3/SIG/10665 details the prerequisites which shall be met before moving equipment into the RoSE schedule for maintenance.

There should be no outstanding maintenance on the equipment.

6 Task Intervals

The tables contained in clause 6 define the frequency intervals in days for each SMS task

6.1 NR/SMS/Part/C

NR/SMS Ref	**Service**	**Normal Interval**	**Maximum Interval**
AP11	A	364	364
AP12	B	364	364
AW11	A	91	364
AW11	B	364	364
AW11	RA	364	364
AW11	RE	FoF	FoF
AW15	B	364	364
AW15	PT	1820	1820

NR/SMS Ref	Service	Normal Interval	Maximum Interval
AX11	A	91	91
AX11	B	364	364
AX12	A	91	364
AX12	B	364	364
AX15	A	91	91
AX15	B	364	364
AX15	PT	364	364
AX28	A	91	364
AX28	B	364	364
AX29	A	91	364
AX29	B	364	364
AX30	B	364	364
AX31	B	364	364
AX40	PT1	1	28
AX40	PT2	364	728
AX40	PT3	364	FoF
AX41	B	364	1820
AX41	PT1	364	FoF
AX41	PT2	364	FoF
AX42	C	728	728
AX51	B	182	182
AX99	B	364	364
BA11	B	FoF	FoF
BA13	DS	1	1
BA13	RT	91	364
BA13	A	364	364
BA16	B	364	364
BA16	PT	1820	1820
BR11	A	91	91
BR11	B	364	364
BR12	A	91	91
BR12	B	364	364
BR20	B	364	364
CA02	A	91	91
CE03	A	91	91
CE03	B	364	364
CS02	DS	1	7

NR/SMS Ref	Service	Normal Interval	Maximum Interval
CS02	RS	28	91
CS02	A	91	91
CS02	B	364	364
CS03	DS	1	7
CS03	RS	28	91
CS03	A	91	91
CS03	B	364	364
CS04	DS	1	7
CS04	RS	28	91
CS04	A	91	91
CS04	B	364	364
CS05	WS	7	7
CS05	RS	28	91
CS05	A	91	91
CS05	B	364	364
CS06	DS	1	7
CS06	RS	7	91
CS06	A	91	91
CS06	B	364	364
CS06	PT	1456	1456
DE11	A	91	91
EL12	B	364	FoF
EL12	RE	FoF	FoF
EL13	PT	3640	3640
EL21	PT	91	364
EL21	A	91	364
EL21	B	364	728
EL31	PT1	91	364
EL31	PT2	364	364
EL31	A	91	364
EL31	B	364	728
EL32	B	364	364
EL33	RC1	7	7
EL33	RC2	28	28
EL33	A	91	91
EL33	B	364	364
EL34	B	364	364
EL34	C	1820	1820

NR/SMS Ref	Service	Normal Interval	Maximum Interval
EL34	D	3640	3640
EL37	PT	1092	1092
ER11	A	91	FoF
ER11	B	364	FoF
ER11	PT	1820	FoF
ER12	A	91	91
ER12	B	364	364
ER12	PT	1820	1820
ER15	A	91	91
ER15	B	364	364
ER15	PT	1820	1820
ER15	RE	364	364
ER16	RC	7	28
ER16	A	91	91
ER16	B	364	364
ER16	PT	1820	1820
ER16	RE	364	364
ER17	A	91	FoF
ER17	B	364	FoF
ER17	PT	3640	FoF
ER17	RE	364	364
ER21	A	91	91
ER21	B	364	364
ER21	PT	1820	1820
ER21	RE	364	364
ER22	A	91	FoF
ER22	B	364	FoF
ER22	PT	1820	FoF
ER22	RE	364	364
ER23	B	364	FoF
ER23	PT	1820	FoF
GF01	A	91	364
GF01	B	364	364
IC11	DS	1	1
IC11	RT	7	42
IC11	A	91	91
IC11	B	364	364
IC11	PT	728	1720

NR/SMS Ref	Service	Normal Interval	Maximum Interval
IC12	DS	1	FoF
IC12	WS	7	FoF
IC12	MS	28	FoF
IC12	A	91	FoF
IC12	B	364	FoF
IC12	PT 1	728	728
IC12	PT 2	1456	1456
IC12	PT 3	3276	3276
IC14	DS	1	1
IC14	RS	7	7
IC14	A	91	FoF
IC14	B	364	364
IC14	PT	728	728
IC15	DS	1	1
IC15	A	91	91
IC15	B	364	364
IC16	DS	1	1
IC16	RS	7	7
IC16	A	91	91
IC16	B	364	364
IC17	DS	1	1
IC17	WS	7	7
IC17	MS	28	28
IC17	A	91	91
IC17	B	364	364
IC18	B	364	364
IC20	A	91	91
IC20	B	364	364
IC51	RS	28	28
IC51	A	91	91
IC51	B	364	364
IC51	PT	728	1820
IC52	A	91	91
IC52	B	364	364
IC53	A	91	91
IC53	B	364	364
IC53	PT	1456	1456
IC61	A	182	364

NR/SMS Ref	Service	Normal Interval	Maximum Interval
IC61	B	364	364
IE21	DS	1	1
IE21	A	91	91
IE21	B	364	364
IE22	DS	1	1
IE22	RS	28	28
IE22	A	91	91
IE22	B	364	364
IE22	PT	1820	1820
IE23	DS	1	1
IE23	RS1	7	7
IE23	RS2	14	14
IE23	RS3	28	28
IE23	A	91	91
IE23	B	364	364
IE23	PT	364	364
IE24	DS	1	1
IE24	RS1	7	7
IE24	RS2	14	14
IE24	A	91	91
IE24	B	364	364
IE25	DS	1	1
IE25	RS	28	28
IE25	A	91	91
IE25	B	364	364
IE25	PT	1820	1820
IE26	RT	91	91
IE26	A	91	91
IE26	B	364	364
IE27	RS	7	7
IE27	A	91	91
IE28	RS	28	28
IE28	A	91	91
IE28	B	364	364
IE29	DS	1	1
IE29	B	364	364
IE29	PT	1820	1820
IF01	DS	1	1

NR/SMS Ref	Service	Normal Interval	Maximum Interval
IF01	RS1	7	7
IF01	RS2	28	28
IF01	B	364	364
IF01	PT1	1820	1820
IF01	PT2	2548	2548
IF01	PT3	2912	2912
IF01	PT4	728	728
IF02	B	364	364
IF03	DS	1	1
IF03	RS1	7	7
IF03	B	364	364
IG01	DS	1	1
IG01	RT	182	182
IG02	DS	1	1
IG02	A	364	364
IK01	DS	1	1
IK01	RT1	28	28
IK01	A	91	91
IK01	B	364	364
IS11	DS	1	FoF
IS11	RT	7	FoF
IS11	A	91	FoF
IS11	B	364	364
IS11	PT	1820	1820
IS12	A	7	7
IS12	B	364	364
IS12	PT	1456	1456
IS13	RS	1	FoF
IS13	A	91	FoF
IS13	B	364	364
IS13	PT1	728	728
IS13	PT2	3640	3640
IS13	PT3	5096	5096
IS14	DS	1	1
IS14	RS	7	7
IS14	A	91	91
IS14	B	364	364
IS15	A	91	FoF

NR/SMS Ref	Service	Normal Interval	Maximum Interval
IS15	B	364	FoF
IS20	DS	1	1
IS20	A	91	91
IS20	B	364	364
IS30	A	91	91
IS30	B	364	364
IS35	A	91	91
IS35	B	364	364
JA10	A	91	FoF
JA10	B	364	FoF
LC09	B	364	364
LC09	RT	7	364
LC10	A	91	91
LC10	B	364	364
LC11	A	91	91
LC11	B	364	364
LC14	A	91	364
LC14	B	364	364
LC15	A	91	91
LC15	B	364	364
LC15	R1	364	364
LC16@	A	91	364
LC17@	A	91	FoF
LC17	B	364	FoF
LC20	R1	28	28
LC20	R2	91	91
LC20	R3	182	182
LC20	R4	364	364
LC21	A	91	91
LC21	B	364	364
LC22	B	364	364
LC23	A	91	91
LC23	B	364	364
LC24	A	91	91
LC24	B	364	364
LC26	A	91	91
LC26	B	364	364

NR/SMS Ref	Service	Normal Interval	Maximum Interval
LC27	A	91	91
LC29	A	91	91
LC29	B	364	364
LC30	A	91	FoF
LC30	B	364	364
LC31	A	91	91
LC31	B	364	364
LC32	B	364	364
LC32	PT	1820	1820
LC50	A	91	91
LC50	B	364	364
LC70	B	364	364
LC71	B	364	364
LC72	B	364	364
LC73	B	364	364
LC81	A	91	91
LC81	B	364	364
LC84	A	91	91
LC85	A	91	91
LC86	A	91	FoF
LC86	B	364	364
LV11	A	91	364
LV12	A	91	364
LV13	A	91	364
LV14	A	91	364
LV15	A	91	364
LV16	A	91	364
LV17	A	91	364
LV21	A	91	182
LV21	B	364	364
LV31	A	91	91
LV41	A	91	91
LV41	B	364	364
LV51	A	91	91
LV51	B	364	364
LV52	A	91	91

NR/SMS Ref	Service	Normal Interval	Maximum Interval
LV53	A	91	91
LV53	B	364	364
LV99		As Required	As Required
MP01	DT	1	7
MP01	RS	28	91
MP01	A	91	91
MP01	B	364	364
MP02	DT	1	7
MP02	RS	28	91
MP02	A	91	91
MP02	B	364	364
MP03	DT	1	7
MP03	RS	28	91
MP03	A	91	91
MP03	B	364	364
MP04	DT	1	7
MP04	RS	28	91
MP04	A	91	91
MP04	B	364	364
MP05	DT	1	7
MP05	RS	28	91
MP05	A	91	91
MP05	B	364	364
OD01	B	364	364
OD01	C	1820	1820
OD02	B	364	364
PA01*	RT	91	91
PA01*	A	91	91
PA21*	A	91	91
PA21	B	364	364
PB11*	RT	91	91
PB11*	A	91	91
PB11	B	364	364
PB11	V1	91	91
PB11	R1	182	182
PB11	R2	364	364
PB15	A	91	FoF

NR/SMS Ref	Service	Normal Interval	Maximum Interval
PB15	B	364	FoF
PB16*	RT	91	91
PB16*	A	91	91
PB16	B	364	364
PB17*	RT	91	91
PB17*	A	91	91
PB17	B	364	364
PB18*	A	91	91
PB18	B	364	364
PB19	B	364	364
PB21*	A	91	91
PB21	B	364	364
PC05*	RT	91	91
PC05	A	91	91
PC05	B	364	364
PC05	V1	91	91
PC05	R1	182	182
PC05	R2	364	364
PC22*	RT	91	91
PC22*	A	91	91
PC22	B	364	364
PC31*	RT	91	91
PC31*	A	91	91
PC31	B	364	364
PC33*	RT	91	91
PC33*	A	91	91
PC33	B	364	364
PC41*	RT	91	91
PC41*	A	91	91
PC41	B	364	364
PC41	V1	91	91
PC41	R1	182	182
PC41	R2	364	364
PC42*	RT	91	91
PC42*	A	91	91
PC42	B	364	364
PC49	A	91	91

NR/SMS Ref	Service	Normal Interval	Maximum Interval
PC51	RT	91	91
PC51	B	364	364
PC61	RC	91	91
PC61	A	91	91
PC81*	RT	91	91
PC81*	B	364	364
PC91*	RT	91	91
PC91	A	91	91
PC91	B	364	364
PC92	A	91	91
PC92	B	364	364
PC95	RT	91	91
PC95	A	91	91
PC95	B	364	364
PD01	A	91	364
PD01	B	364	364
PD02	A	91	364
PD02	B	364	364
PD03	A	91	91
PF01*	A	91	182
PF02	A	91	91
PF03	A	91	364
PF04	A	91	91
PF04	B	364	FoF
PF05	A	91	182
PF07	B	364	364
RC01	DS	1	7
RC01	RS	7	91
RC01	A	91	91
RC01	B	364	364
RC02	DS	1	7
RC02	RS	7	91
RC02	A	91	91
RC02	B	364	364
RC03	DS	1	7
RC03	RS	7	91
RC03	A	91	91

NR/SMS Ref	Service	Normal Interval	Maximum Interval
RC03	B	364	364
RC04	DS	1	7
RC04	RS	7	91
RC04	A	91	91
RC04	B	364	364
RC05	DS	1	7
RC05	RS	7	91
RC05	A	91	91
RC05	B	364	364
RC07	DS	1	7
RC07	RS	7	91
RC07	A	91	91
RC07	B	364	364
RC08	DS	1	7
RC08	RS	7	91
RC08	A	91	91
RC08	B	364	364
RC09	DS	1	FoF
RC09	RS	7	FoF
RC09	A	91	FoF
RC09@	B	364	FoF
RC10	DS	1	7
RC10	RS	7	91
RC10	A	91	91
RC10	B	364	364
RC11	DS	1	FoF
RC11	RS	7	FoF
RC11	A	91	FoF
RC11@	B	364	FoF
RC12	DS	1	7
RC12	RS	7	91
RC12	A	91	91
RC12	B	364	364
RC13	DS	1	7
RC13	RS	7	91
RC13	A	91	91
RC13	B	364	364
RC14	DS	1	7

NR/SMS Ref	Service	Normal Interval	Maximum Interval
RC14	RS	7	91
RC14	A	91	91
RC14	B	364	364
RC15	DS	1	7
RC15	RS	7	91
RC15	A	91	91
RC15	B	364	364
RC16	DS	1	FoF
RC16	RS	7	FoF
RC16	A	91	FoF
RC16@	B	364	FoF
RE01	B	364	364
RE01	PT	1456	1456
RE02	B	364	364
RE02	PT	1456	1456
RE20	B	364	364
RE20	PT	1456	1456
SB11	RC	42	FoF
SB11	A	91	91
SB11	B	364	364
SB12	RC	7	FoF
SB12	A	91	364
SB12	B	364	1092
SB21	DS	1	1
SB21	RC	28	28
SB21	A	91	91
SB21	B	364	364
SG01	B	364	364
SG02	B	91	1456
SG03	B	364	364
SG03	RB	364	364
SG05	B	364	364
SG05	R1	364	364
SG07	A	91	91
SG07	B	364	364
SG07	PT	5096	9828
SG07	RE	FoF	FoF

NR/SMS Ref	Service	Normal Interval	Maximum Interval
SG08	R1	364	1456
SG09	A	91	91
SG09	B	364	364
SG09	C	1820	1820
SG09	PT	5096	9999
SG09	RE	FoF	FoF
SG10	A	91	364
SG10	B	364	364
SG10	PT	5096	9828
SG10	R1	1456	1456
SG11	A	91	91
SG11	B	364	364
SG11	PT1	3640	3640
SG11	R1	364	728
SG11	R2	364	728
SG11	PT2	3640	3640
SG12	A	91	182
SG12	B	364	364
SG12	PT1	2548	2548
SG12	PT2	3640	3640
SG13	A	91	364
SG13	B	364	364
SG14	A	91	728
SG14	B	364	728
SG14	PT	2912	2912
SG14	R2	1456	1456
SG15	A	91	91
SG15	B	364	364
SG15	PT1	3640	3640
SG15	PT2	3640	3640
SG15	R1	1456	1456
SG15	R2	364	728
SG15	R3	364	728
SG15	RE	FoF	FoF
SG16	A	91	91
SG16	B	364	364
SG16	R1	364	728
SG17	A	91	91

NR/SMS Ref	Service	Normal Interval	Maximum Interval
SG17	R1	364	1456
SG17	PT	2912	2912
SG18	A	91	728
SG18	B	364	728
SG18	PT	2912	2912
SG19	A	91	91
SG19	B	364	364
SG19	PT1	3640	3640
SG19	R1	364	728
SG19	R2	364	728
SG20	A	91	364
SG20	RA	364	364
SG21	PT	91	9828
SG22	A	91	91
SG22	B	364	364
SG22	PT	2912	2912
SG22	R1	1456	1456
SG90	A	91	91
SG90	B	364	364
SG95	A	91	91
SG95	B	364	364
SG96	A	91	91
SG96	B	364	364
SW01	A	91	FoF
SW01	B	364	FoF
SW01	RE	364	364
SW02	A	91	FoF
SW02	RA	364	364
SW03	A	91	91
SW03	B	364	364
SW20	A	91	91
SW20	B	364	364
TC02	A	91	364
TC02	B	364	364
TC03	A	91	182
TC03	B	364	364
TC03	PT1	364	2184

NR/SMS Ref	Service	Normal Interval	Maximum Interval
TC03	PT2	364	2184
TC03	RA	182	728
TC03	RB	364	728
TC04	A	91	728
TC04	B	364	728
TC04	PT1	364	2184
TC04	PT2	364	2184
TC05	A	91	364
TC05	B	364	364
TC06	A	91	364
TC06	B	364	364
TC06	RA	182	182
TC06	RB	364	364
TC06	RE	364	364
TC08	A	91	364
TC08	B	364	364
TC08	R1	182	728
TC08	R2	364	728
TC09	A	91	364
TC09	B	364	364
TC09	R1	364	364
TC10	A	91	364
TC10	B	364	364
TC10	RA	364	364
TC12	A	91	364
TC12	B	364	364
TC12	RE	364	728
TC14	A	91	364
TC14	B	364	364
TC14	RA	364	364
TC15	A	91	728
TC15	B	364	364
TC16	A	91	364
TC16	B	364	364
TC16	C	364	364
TC17	A	91	364
TC17	B	364	364
TC30	A	91	364

NR/SMS Ref	Service	Normal Interval	Maximum Interval
TC30	B	91	364
TC91	A	91	728
TC91	B	364	728
TC91	PT	364	728
TC91	R1	364	364
TD11	A	91	91
TD11	B	364	364
TD21	DS	1	1
TD21	A	91	182
TD21	B	364	364
TD31	A	91	182
TD31	B	364	364
TD31	R1	364	364
TD32	A	91	182
TD32	B	364	364
TD33	A	91	91
TD33	B	364	364
TD35	RS	42	42
TD35	A	91	FoF
TD35	B	364	FoF
TD36	A	91	91
TD36	B	364	364
TD37	A	91	91
TD37	B	364	364
TD38	A	91	91
TD38	B	364	364
TD38	PT	546	546
TD40	DS	1	1
TD40	RS	28	28
TD40	A	91	91
TD40	B	364	364
TD40	PT	1820	1820
TD42	A	91	91
TD42	B	364	364
TD42	PT	1095	1820
TP11	A	91	364
TP11	B	364	364

NR/SMS Ref	Service	Normal Interval	Maximum Interval
TP11	PT	1820	1820
TP11	RA	364	364
TP11	RE	FoF	FoF
TP22	A	91	182
TP22	B	364	364
TP23	A	91	182
TQ01	A	91	91
TQ01	B	364	364
TQ11	A	91	91
TQ11	B	364	364
TQ12	A	91	91
TQ12	B	364	364
TQ13	B	364	364
TQ14	B	364	364
TS01	A	91	FoF
TS01	B	364	364
TS02	A	91	91
TS03	A	91	91
TS03	B	364	364
TS20	RC	7	7
TS20	A	28	FoF
TS20	B	364	FoF
TS21	A	91	91
TS21	PT	3640	3640
TS22	B	364	364
TS23	A	91	91
TS23	B	364	364
TV01	A	91	91
TV01	B	364	364
TV02	A	91	FoF
TV02	B	364	364
TV03	A	91	FoF
TV03	B	364	364
TW01	A	91	FoF
TW02	A	91	91
VS30	RT	28	28
VS30	A	364	364

NOTE1: *Services marked with a '*' may not be cancelled at the end of the "missed maintenance" period.*

NOTE2: *Service marked with a '#' indicates that the maximum interval is weekly at an unmanned site.*

NOTE3: *Services marked with a '@'*

The interval of NR/SMS/LC16 – A, can be extended annually if the headlights or DCI (Drivers Crossing Indicator) are LED.

The interval of NR/SMS/LC17 – A, can be extended annually if the barrow light is an LED.

The interval of RC09 – B, RC11-B and RC16-B shall only have their maximum frequency changed where there is no BR ERSE (Electronic Route Setting Equipment) present.

6.2 NR/SMS/Part/D

NR/SMS Ref	Normal Interval	Maximum Interval
LX70/1	0364	0364
LX70	0364	0364
LX71	0364	0364
LX72	0364	0364
LX73	0364	0364
LX74	0364	0364
LX75	0364	0364
LX76	0364	0364
LX77	0364	0364
LX78	0364	0364
LX80	0364	0364
LX79	0364	0364
LX81	0364	0364
LX83	0364	0364
LX94	0364	0364

6.3 NR/SMS/Part/E

NR/SMS Ref	Service	Normal Interval	Maximum Interval
BA12	B	0364	0364
BA12	RE	FoF	FoF
HO11	A	0091	0091
HO11	B	0364	0364
HO12	A	0091	0091
HO12	B	0364	0364
HO12	PT	1092	1092
HO13	B	0364	0364
HO14	B	0364	0364

6.4 NR/SMS/Part/T

NR/SMS Ref	Service	Normal Interval	Maximum Interval
CA11	A	0364	0364
IR11	RT	0028	0028
IR11	A	0091	0091
IR12	A	0091	0091
IR12	B	0364	0364
TE01	For frequencies see Table 5		
TE02	A	1820	1820
TE02	B	1820	1820
TE02	C	0364	0364

Telephone Type	Applicable Appendices	Service	Frequency
Crossing telephones	B, C, D, E	A	364
Emergency telephones (inc telephones in HV electrical equipment rooms etc)	B, C, D, E	A	364
PETS telephones	F	A	364
KETS telephones	F	A	364
Signal Box telephones (Magneto only)	C	A	364
Signal Box/Control telephones		No maintenance required	
Equipment Room telephones		No maintenance required	
Lineside telephones associated with signalling equipment (Note 1)	B, C, D, E	A	Same frequency of maintenance as associated signalling equipment (Note 2) (minimum of 4 yearly)
All other lineside telephones	B, C, D, E	A	364

Table 5 – TE01 Frequencies

6.5 NR/L2/SIG/11655 – Management of Cable and Wire Insulation

Category	Condition	Sample Size	Maximum Interval
During the first 15 years following installation	-------	0%	-------
1	Normal	5%	0728
2	Fair	25%	0728
3	Poor	50%	0364
4	Severe	100%	0182
5	Extreme	100%	0182

Appendix A - Amendments to Maintenance Intervals

Where the S&TME wishes to amend the interval at which an existing SMS is applied to a specific asset the process shown in Figure 1 should be followed.

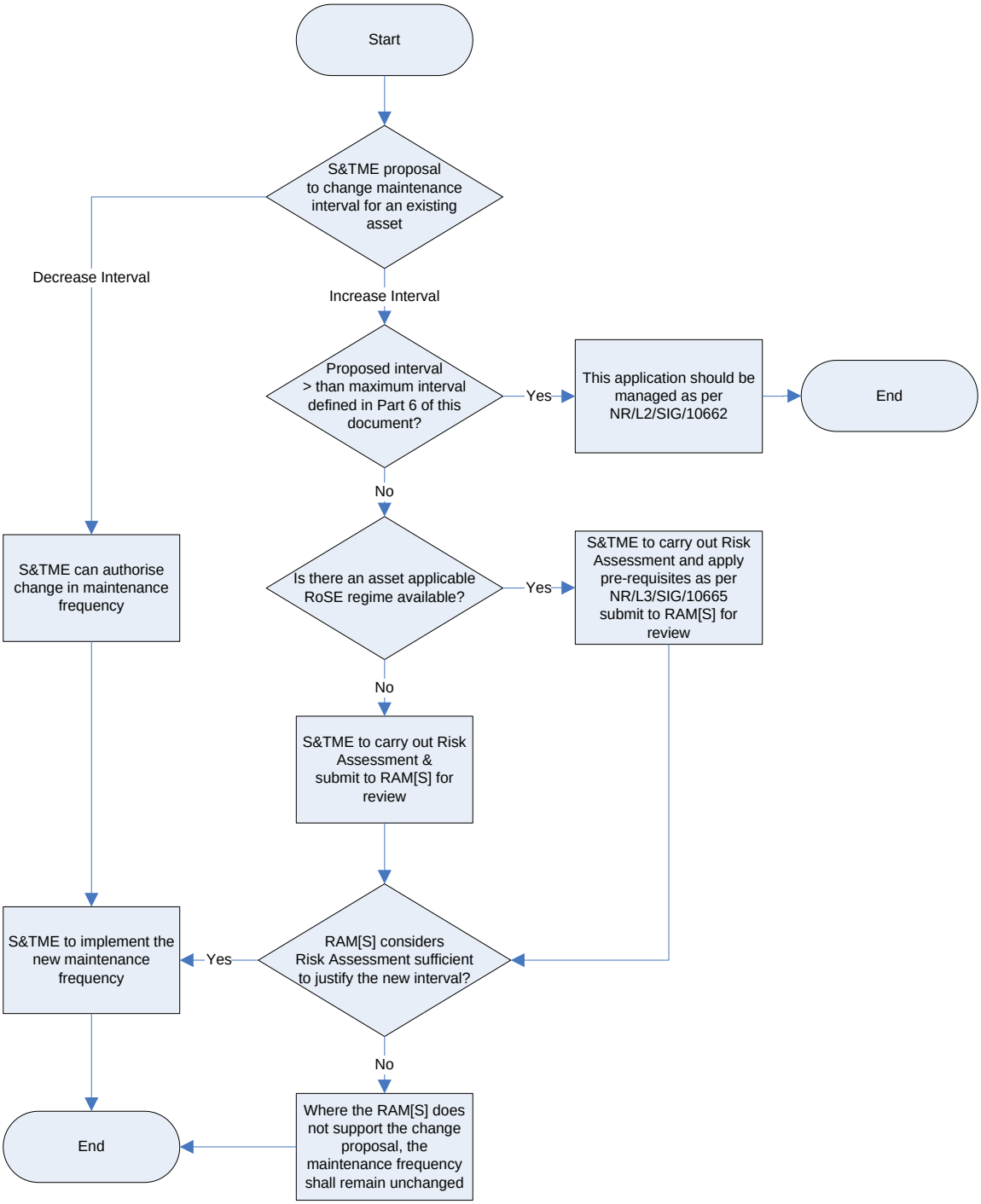

Figure 1 – Interval Amendment Process

Appendix B - Risk Assessment Template

Where “Late Maintenance” services are not completed within their specified tolerance levels within NR/L3/SIG/10661 and become “missed maintenance”, they shall be risk assessed before being allowed to continue in service for an extended period of time, or in the case of certain services, being cancelled.

A risk assessment is required for all services which are scheduled at monthly intervals or greater.

The risk assessment shall consider the maintenance history of the item, its failure rate and any safety hazards that might be introduced by deferring the service.

Section 1: Details of Missed Maintenance

Assets and Maintenance Services Affected: (Attach ellipse download for multiple items)
Provide reason why maintenance has not been completed and cannot be caught up:
Detail any safety implications:
Detail mitigation measures applied:

Section 2: Risk Assessment Check List

Confirm the scheduling frequency is not 6 months or longer?	Yes/No
Confirm the service is not marked with a (*) in table shown in 6.1?	Yes/No
Confirm the last service was conducted on time?	Yes/No
Confirm there is no corrective maintenance which requires re inspection?	Yes/No
Confirm the fault history of the asset(s) has remained acceptable since the last service?	Yes/No
Confirm that mitigations are suitable to manage any safety implications detailed?	Yes/No
Conform that mitigation measures have been completed?	Yes/No

Section 3: Authorisation for Cancelation

If you have had to answer No to any of the questions in the section 2, the service should not be cancelled.

SM(S) Name:	Signature:	Date:
S&TME Name:	Signature:	Date:
RAM (S) Name:	Copy Sent to RAM (Date):	

END

Standard and control document briefing note

Ref: NR/L3/SIG/10661	**Issue:** 25
Title: Signalling Maintenance Task Intervals	
Publication date: 02 December 2023	**Compliance Date:** 02 March 2024
Standard/Control Document Owner: Network Technical Head Signalling	
Standard change lead/contact for briefings: Chris Cresswell	**Tel:** 0770 291 4534

Purpose:

The purpose of this document is to set the safety and performance intervals applicable for carrying out signalling maintenance tasks and tests.

The intervals shown are intended to maintain the designed safety and reliability, by detecting and correcting deficiencies to signalling equipment before there is deterioration or failure.

Scope:

This document applies to all staff that perform preventative or corrective maintenance to signalling assets on Network Rail managed infrastructure.

The intervals relate to the maintenance tasks defined in the Signal Maintenance Specifications, or that need to be applied for Reliability-Centred Maintenance.

What's new, what's changed and why:

Following the COVID outbreak and the subsequent introduction of NB 185 the Eastern Region maintained the challenge around the effectiveness / applicability of the signalling maintenance scheduled tasks (MSTs). The output of this challenge has been the introduction of a revised methodology to change MSTs. Following the NR assurance framework this methodology had been assessed as significant by Network Rail Assurance Panel (NRAP) and has subsequently been validated through CSM-RA and additionally as part of the assurance framework was approved for implementation through Signalling and Level Crossings Standard and Controls Steering Group (SCSG). A number of the changes are related to this programme with some additional service intervals to support the inclusion of the service in the December 2023 update of NR/L3/SIG/10663 for new assets being introduced on the network.

Detail of change

NR/SMS Ref	Service	Normal Interval	Maximum	Summary of changes
AX40	PT3	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
AX41	B	364	1820	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
BR20	B	364	364	This service has been introduced to support new equipment coming into use on the network as part of the December 2023 update
EL12	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER11	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER11	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER11	PT	1820	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER17	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER17	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER17	PT	3640	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER22	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER22	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER22	PT	1820	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER23	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
ER23	PT	1820	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IC12	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IC12	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IC12	DS	1	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IC12	MS	28	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IC12	WS	7	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IC14	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update

IG02	DS	1	1	This service has been introduced to support new equipment coming into use on the network as part of the December 2023 update
IG02	RT	364	364	This service has been introduced to support new equipment coming into use on the network as part of the December 2023 update
IS11	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IS11	DS	1	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IS11	RT	7	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IS13	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IS13	RS	1	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IS15	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
IS15	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
JA10	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
JA10	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
LC14	A	91	364	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
LC16	A	91	364	This service has been updated to reflect the amended maintenance tasks in the December 2023 update. The interval of NR/SMS/LC16 – A, can be extended annually if the headlights or DCI are LED.
LC17	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update. The interval of NR/SMS/LC17 – A, can be extended annually if the barrow light is an LED.
LC17	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
LC30	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
LC86	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
PB15	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
PB15	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
PB19	B	364	364	This service has been introduced to support new equipment coming into use on the network as part of the December 2023 update
PC81	B	364	364	This service has been introduced to support new equipment coming into use on the network as part of the December 2023 update
PC81	RT	91	91	This service has been introduced to support new equipment coming into use on the network as part of the December 2023 update
PF03	A	91	364	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
PF04	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
PF05	A	91	182	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC09	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC09	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update. Amber with Green Prerequisite: The interval of NR/SMS/RC09 - B shall only be categorised as green where there is no BR ERSE present.
RC09	DS	1	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC09	RS	7	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC11	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC11	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update. Amber with Green Prerequisite: The interval of

				NR/SMS/RC11 - B shall only be categorised as green where there is no ERSE present.
RC11	DS	1	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC11	RS	7	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC16	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC16	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update. Amber with Green Prerequisite: The interval of NR/SMS/RC16 - B shall only be categorised as green where there is no ERSE present.
RC16	DS	1	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
RC16	RS	7	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
SB11	RC	7	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
SB11	RS	42	FoF	Service did not match SMS Service RS renamed to RC to match SMS/SB12.
SB12	RC	7	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
SG01	B	364	364	This service has been updated to reflect the amended maintenance tasks in the December 2023 update Moved from 9999 back to 364.
SG07	PT	5096	9828	Service frequency changed from 27.4 to 27 years to 9828 rather than 9999.
SG10	PT	5096	9828	Service frequency changed from 27.4 to 27 years to 9828 rather than 9999
SG21	PT	91	9828	This service has been updated to reflect the amended maintenance tasks in the December 2023 update.
SW01	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
SW01	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
SW02	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TC15	A	91	728	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TC91	A	728	728	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TC91	A(1)	91	728	This service has been updated to reflect the amended maintenance tasks in the December 2023 update and renamed from A(1) to A.
TC91	A(2)	-	-	This service has been updated to reflect the amended maintenance tasks in the December 2023 update duplicate service removed.
TC91	A(3)	-	-	This service has been updated to reflect the amended maintenance tasks in the December 2023 update duplicate service removed.
TC91	B	728	728	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TC91	PT	728	728	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TD35	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TD35	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TS01	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TS20	A	28	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TS20	B	364	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TV02	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TV03	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update
TW01	A	91	FoF	This service has been updated to reflect the amended maintenance tasks in the December 2023 update

Module(s)/Section(s)/clause(s)	Summary of changes
Section 3	Definition updated for FoF (Fix on Failure) to give further clarification that Maintenance can still be scheduled against an asset based on condition and engineers' discretion. Added definition for V1 service used in NR/L3/SIG/10663/PartC
Section 4.3.1	Clause above table 3 modified to match the Amber Rag status.
Section 4.3.3	Red clause under table 3 changed to Amber to allow control through variation process if required "Services indicated with a (*) in table in 6.1 shall not be cancelled.".
Section 6	Clause changed from Amber to Green "The tables contained in clause 6 define the frequency intervals in days for each SMS task" Table updated with details included in this briefing note with required conditions placed in the noted below the table.

Affected documents

Reference	Issue	Impact	Document type
NR/L3/SIG/10661	24	Superseded	Standard

Briefing requirements:

Briefings are given to those who have specific responsibilities within, or are directly affected by, this standard/control document.

A copy of briefings may be available from the Standards & Controls site.

Requirements to cascade briefings are described within any implementation plans.

Briefing (O-Overview/ D-Detailed)	Post	Function	Responsible for cascade briefing? Y/N
O	Chief Control, Comm & Signalling Engineer	Technical Authority	Y
O	Network Technical Head Switches & Crossings	Technical Authority	Y
D	Regional Engineering [Signalling & Telecoms]	Regions (Eastern)	Y
D	Regional Asset Manager [Signalling]	Regions (Scotland)	Y
D	Regional Engineering [Signalling & Telecoms]	Regions (NW & C)	Y
D	Regional Head of Engineering & Asset Management [Sig, Ct & Tel]	Regions (Western & Wales)	Y
D	Regional Head of Engineering [Signalling & Telecoms]	Regions (Southern)	Y
Briefing *(O-Overview/ D-Detailed)*	**Role**	**Function**	**Responsible for cascade briefing? Y/N**
O	CCS Engineer	Technical Authority	N
O	S&C Engineer	Technical Authority	N
D	Route Engineer (Signalling)	Regions	Y
O	Asset Engineer	Regions	N
O	SINCS Engineer	Regions	N
D	Signal & Telecoms Maintenance Engineer	Regions (Maintenance)	Y
D	Section Manager (Signals)	Regions (Maintenance)	Y
D	Signalling Technical Support Staff	Regions (Maintenance)	N
D	Works Delivery Manager (Signals)	Regions (Works Delivery)	Y
D	Works Delivery Supervisor (Signals)	Regions (Works Delivery)	N
O	Project Engineer (Signalling)	Regions (Works Delivery)	N

NOTE: *Contractors are responsible for arranging and undertaking their own Detailed and Overview Briefings in accordance with their own processes and procedures.*

Ref:	**TI 184**
Issue date:	04 September 2023
Compliance date:	29 September 2023
Expiry date:	29 September 2025

Technical Instruction: TI 184 Issue 1

Standard/control document affected:

- **NR/L2/SIG/11201 Module X39 (Issue 2), System Application Specification for Overlay Miniature Stop Light Level Crossings**
- **NR/L3/SIG/10661 (Issue 23), Signalling Maintenance Task Intervals**
- **NR/L3/SIG/10663 Signal Maintenance Specifications – NR/SMS/PartC/LC71 (Issue 04), Vamos Crossing System**

This technical instruction will be withdrawn when all Vamos crossing systems have been fitted with IMC040A boards in response to NR/SIN/216.

For further information contact: Jonathan Evans, Network Technical Head Level Crossings Engineering, 07825766715

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1 Reason for issue

This Technical Instruction (TI) has been issued to mitigate the risk of wrong side failures of Vamos overlay miniature stop light (OMSL) level crossing systems between the completion of the activities associated with Special Inspection Notices (SINs) 211 and 212 and the deployment of modified IMC040 boards (which will be known as IMC040A boards). The IMC040A boards are intended to significantly reduce the potential for the identified wrong side failure mode to occur.

NOTE: *The IMC040/IMC040A boards are used to process the information received from the strike-out wheel sensors. The Vamos crossing system uses the output from these boards to determine when to start displaying a green aspect to level crossing users.*

2 Scope

This TI is applicable to all Vamos crossing systems on Network Rail (NR) managed infrastructure.

These changes have been made on a temporary basis. The requirements in this TI apply until the Vamos crossing system concerned has been fitted with the IMC040A boards.

NOTE: *When the IMC040A boards have been accepted for use by NR, there will be separate communications regarding the arrangements for rolling these out to existing Vamos crossing systems and provision of them for use with new Vamos crossing systems.*

3 Requirements

Clause/sub-clause	Change
NR/L2/SIG/11201 Module X39	Add Appendix A of this TI (attached at the back of this TI). ***NOTE:*** *Clause 3 of Appendix A sets out an additional process to support Routes in determining whether it is appropriate to bring a new Vamos crossing system into service at a particular level crossing in advance of the modified components being available.* *Clause 4 of Appendix A contains additional controls which apply should it be decided to bring a new Vamos crossing system into service at a particular level crossing in advance of the modified components being available.* *These controls align with current good practice as implemented on existing Vamos crossing systems in response to NR/SIN/211 and NR/SIN/212.*
NR/L3/SIG/10661	Add temporary Service A activity for Vamos crossing systems

Ref:	**TI 184**
Issue date:	04 September 2023
Compliance date:	29 September 2023
Expiry date:	29 September 2025

<table>
<tr><td>6.1</td><td>(NR/SMS/PartC/LC71) as follows:

<table><tr><th>NR/SMS Ref</th><th>Service</th><th>Normal Interval</th><th>Maximum Interval</th></tr><tr><td>LC71</td><td>A</td><td>0091</td><td>0091</td></tr></table>
NOTE: There is no change to the Service B frequency for LC71.</td></tr>
<tr><td>NR/L3/SIG/10663</td><td>Add Appendix B to NR/SMS/PartC/LC71 (attached at the back of this TI).

This is an additional regime of site inspections for Vamos crossing systems that has been introduced as a temporary Service A activity in NR/SMS/PartC/LC71.

NOTE: There are no changes to the tasks within Service B of LC71.</td></tr>
</table>

Ref:	**TI 184**
Issue date:	04 September 2023
Compliance date:	29 September 2023
Expiry date:	29 September 2025

Approval of Standard and Control Document Owner

Approved by:

Jeremy Morling, Network Technical Head [Signalling]

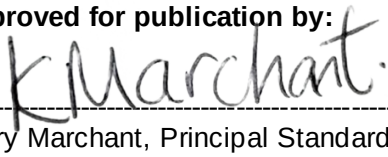
Approval of Delivery Function Authority

Approved by:

Paul Percival, Regional Head of Engineering [Signalling & Telecoms]

Approval of Standards and Controls Management Team

Approved for publication by:



Kerry Marchant, Principal Standards & Controls Manager

Ref:	**TI 184**
Issue date:	04 September 2023
Compliance date:	29 September 2023
Expiry date:	29 September 2025

4 Recipients

Name	**Post**
Various	Regional Engineer (Signalling) or equivalent
Various	Route Engineer (Signalling) or equivalent
Various	Route Level Crossing Managers or equivalent
Simon Read	Programme Engineering Manager (Test & Commissioning)

5 Details of briefing or cascade communication process

Name	**Post**
Author	Regional Engineers (Signalling) or equivalent
Author	Route Engineer (Signalling) or equivalent
Author	Route Level Crossing Managers or equivalent
Author	Programme Engineering Manager (Test & Commissioning)
Regional Engineers/Route Engineers or equivalent	Signal & Telecoms Maintenance Engineers
Signal & Telecoms Maintenance Engineers	Section Managers (Signals)
Signal & Telecoms Maintenance Engineers	Works Delivery Managers (Signals)
Section Manager (Signals) / Works Delivery Managers (Signals)	Team Leader (Signals)
Section Manager (Signals) / Works Delivery Managers (Signals)	Technician (Signals)
Programme Engineering Manager (Test & Commissioning)	Test & Commissioning Engineers

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

TI184 – Appendix A

Appendix to NR/L2/SIG/11201 Module X39 System Application Specification for Overlay Miniature Stop Light Level Crossings

Endorsement and Authorisation

For Endorsement and Authorisation, please refer to TI184

Published and Issued by Network Rail, Waterloo General Office, London, SE1 8SW.

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

User information

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

Red requirements – *no variations permitted*

- Red requirements are to be complied with and achieved at all times.
- Red requirements are presented in a red box.
- Red requirements are monitored for compliance.
- Non-compliances will be investigated and corrective actions enforced.

Amber requirements – *variations permitted subject to approved risk analysis and mitigation*

- Amber requirements are to be complied with unless an approved variation is in place.
- Amber requirements are presented with an amber sidebar.
- Amber requirements are monitored for compliance.
- Variations can only be approved through the national variations process.
- Non-approved variations will be investigated and corrective actions enforced.

Green guidance – *to be used unless alternative solutions are followed*

- Guidance should be followed unless an alternative solution produces a better result.
- Guidance is presented with a dotted green sidebar.
- Guidance is not monitored for compliance.
- Alternative solutions should be documented to demonstrate effective control.

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

Reference documentation

Notice Board 215 Frauscher Wheel Sensor RSR123

Legislation

No legislation has been identified that is applicable to the content of this standard/control document.

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

Contents

1 Scope 5
2 Definitions 5
3 Vamos Crossing System Entry into Service Decision Process 5
3.1 Overview 5
3.2 Permanent Speed Restriction Changes 8
3.3 Temporary Speed Restriction Removal 8
3.4 Other Proposed Enhancements 9
3.5 Long Signal Sections 9
3.6 Undertaking Site-specific Assessment 10
3.7 Peer Review of Site-specific Assessment 13
3.8 Site-specific Assessment Conclusions 14
3.9 Bringing a Vamos Crossing System Equipped with the Current IMC040 Boards into Service 14
3.10 Consider Alternative OMSL Systems 15
3.11 Delay Vamos Crossing System Entry into Service Until IMC040A Boards Become Available 16
3.12 Implement an Alternative OMSL System 16
4 Entry into Service Conditions for Vamos Crossing Systems Equipped with the Current IMC040 Boards 16
4.1 Installation Activities 16
4.2 Commissioning Activities 17
4.3 Maintenance Preparations 17

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

1 Scope

This appendix to NR/L2/SIG/11201 Module X39 applies to all proposals to bring new Vamos crossing systems into service on Network Rail (NR) managed infrastructure until such time as modified IMC040 boards (to be known as IMC040A boards) have been accepted for use and are available for installation as part of new Vamos crossing systems.

This appendix is not applicable to other Overlay Miniature Stop Light (OMSL) systems.

2 Definitions

For the purposes of this document the following terms are defined:

- Current IMC040 board – the version of IMC040 board (encompassing both hardware and software) which is referenced on product acceptance certificate PA05/05850 issue 8 (or earlier).
- IMC040A board – a version of the IMC040 board with amended software which has been developed by Frauscher to eliminate a potential wrong side failure mode within the Vamos system. The IMC040A board has been accepted for use on NR infrastructure and plans for its deployment to replace current IMC040 boards in Vamos crossing systems are currently being developed. The board replacement activity is outside the scope of this document and TI184.

Refer to NR/L2/SIG/11201 Module X39 for other definitions.

3 Vamos Crossing System Entry into Service Decision Process

3.1 Overview

3.1.1

Figure 1 below is a flowchart representation of the process for deciding whether it is appropriate to bring a new Vamos crossing system into service before IMC040A boards are available for operational use at the crossing in question.

The numbers in brackets within the flow chart are cross-references to the subsequent sections of this appendix which set out the requirements and guidance associated with each step.

3.1.2

The considerations and outcome of the decision process set out in this appendix for each level crossing considered shall be documented.

Rationale: To provide an audit trail of decision making.

There is no mandatory template for recording the issues considered and outcome of the decision process, however, adopting a format which reflects the structure of the process flowchart set out in Figure 1 enables subsequent readers of the document to confirm that all the relevant issues were considered.

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

3.1.3

The outcome of the decision process shall be accepted by the Route Engineer (Signalling) and Route Level Crossing Manager, or equivalent roles, before entry into service activities commence on site.

Rationale: To confirm that key accountable roles for asset and risk management at the level crossing are supportive of the intended actions.

Consultation with other affected parties, such as operations management, may also be appropriate during the decision process.

It is envisaged that working through the decision process will be led by Route teams, but it can be undertaken by any party with access to the information needed to consider the questions and issues raised within the process.

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

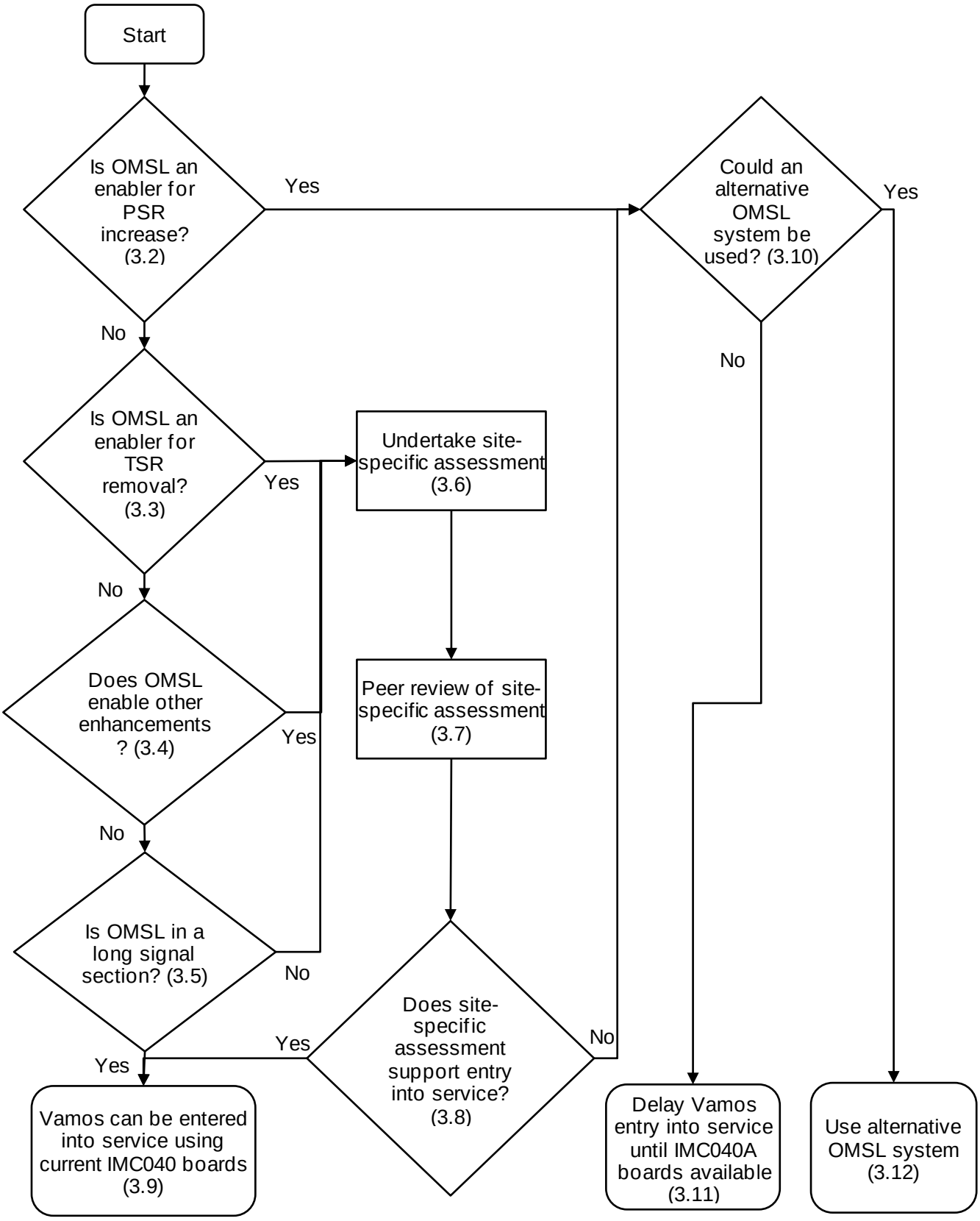


Figure 1 – Vamos Crossing System Entry into Service Decision Flowchart

3.2 Permanent Speed Restriction Changes

3.2.1

Where the provision of an OMSL system is proposed in order to permit a permanent speed restriction (PSR) to be increased, a Vamos crossing system shall not be brought into service if it is equipped with the current IMC040 boards.

Rationale: To avoid introducing a wrong side failure risk in situations where there is no existing safety hazard to be mitigated. Hazard review by a group of subject matter experts from across the Regions has concluded that it is not appropriate to bring a Vamos crossing system into service with the current IMC040 boards in situations where the provision of an OMSL solution is driven by a need to mitigate elevated hazards arising from a proposed increase in PSR.

Note: For the purposes of this process the current IMC040 boards are those referenced on product acceptance certificate PA05/05850 issue 8 (or earlier).

3.2.2

If the provision of an OMSL has been proposed in order to permit a PSR increase, the next step in the decision process is covered by section 3.10. If no PSR increase is proposed, the next step in the decision process is covered by section 3.3.

3.3 Temporary Speed Restriction Removal

3.3.1

Where the provision of an OMSL system is proposed in order to permit temporary speed restrictions (TSRs) to be removed, a site-specific assessment of the current situation at the crossing and the implications of introducing a Vamos crossing system equipped with the current IMC040 boards shall be undertaken.

Rationale: To allow a more detailed consideration of the risks and benefits associated with the potential introduction of a Vamos crossing system.

This circumstance typically arises at a level crossing where crossing users' available sighting distance for trains approaching at the PSR is deficient and TSRs have been applied to reduce train speeds to a level commensurate with the available sighting distance.

3.3.2

Section 3.6 sets out further requirements and guidance related to completing the site-specific assessment when the provision of a Vamos crossing system is intended to allow TSRs to be removed.

Note: The circumstances described in sections 3.4 and 3.5 may also be relevant at a particular level crossing. Where this is the case, these circumstances are also considered as part of the site-specific assessment.

If there are no proposed changes to TSRs, the next step in the decision process is covered by section 3.4.

3.4 Other Proposed Enhancements

3.4.1

Where the provision of an OMSL is proposed in order to permit an enhancement of the wider railway system, excluding changes to speed restrictions, a site-specific assessment shall be undertaken which considers:

a) The current situation at the crossing, and

b) The implications of introducing a Vamos crossing system equipped with the current IMC040 boards.

Rationale: To allow a more detailed consideration of the risks and benefits associated with the potential introduction of a Vamos crossing system.

Enhancements in this context refers to changes to the railway system which have the potential to impact the number of trains passing over the level crossing or the behaviour of trains in the vicinity of the level crossing. This could include, for example, a planned increase in train service frequency or the proposed removal of whistle boards associated with the level crossing.

3.4.2

Section 3.6 sets out further requirements and guidance related to completing the site-specific assessment when the provision of a Vamos crossing system is intended to allow an enhancement to the wider railway system.

Note: The circumstances described in sections 3.3 and 3.5 may also be relevant at a particular level crossing. Where this is the case, these circumstances are also considered as part of the site-specific assessment.

If there are no proposed enhancements relevant to the level crossing, the next step in the decision process is covered by section 3.5.

3.5 Long Signal Sections

3.5.1

Where the level crossing at which an OMSL is proposed to be installed is not located within a long signal section, a site-specific assessment of the current situation at the crossing and the implications of introducing a Vamos crossing system equipped with the current IMC040 boards shall be undertaken.

Rationale: To allow a more detailed consideration of the risks and benefits associated with the potential introduction of a Vamos crossing system.

Long signal sections are characterised by the lengthy transit times for trains travelling at the permitted speed between two consecutive stop signals. The signaller has low awareness of the precise position of a train in a long signal section and this can lead to prospective crossing users being instructed to wait for considerable periods when they contact the signaller for permission to cross. Users often fail to understand why the signaller cannot provide an exact indication of where the train is and can become frustrated at waiting for an unknown and often lengthy period of time. Consequently, they might decide to cross without confirmation from the signaller that it is safe to do

so. The provision of an OMSL solution at level crossings within long signal sections can be an effective mitigation for this risk.

In shorter signal sections the signaller has a better understanding of the position of trains relative to the level crossing, user waiting times are shorter and, consequently, the likelihood of users choosing to cross when it is unsafe to do so is lower.

The Level Crossing Manager will generally be able to advise whether a particular level crossing is in a long signal section. This information may also be recorded in the level crossing risk assessment.

3.5.2

Section 3.6 sets out further requirements and guidance related to completing the site-specific assessment when the provision of a Vamos crossing system is not within a long signal section.

Note: The circumstances described in sections 3.3 and 3.4 may also be relevant at a particular level crossing. Where this is the case, these circumstances are also considered as part of the site-specific assessment.

If the OMSL is located within a long signal section, the next step in the decision process is covered by section 3.9.

3.6 Undertaking Site-specific Assessment

3.6.1

A site-specific assessment is relevant to those level crossings where the proposed introduction of a Vamos crossing system is:

a) Intended to allow the removal of TSRs, or

b) Intended to allow other enhancements which are not related to changes in speed restrictions, or

c) Not located in a long signal section.

Note: It is possible for more than one of the above circumstances to apply at a level crossing. The site-specific assessment undertaken for such a level crossing should consider all relevant circumstances and the factors which are applicable to them.

3.6.2

Where the removal of TSRs is proposed, the site-specific assessment shall consider the following:

a) The extent to which the existing TSRs are effective at managing the hazards that exist at the level crossing,

b) Whether the TSRs have an impact on any other level crossings in the vicinity,

c) The vulnerability of the level crossing to a wrong side failure of the Vamos crossing system,

d) Any other site-specific factors that influence the risk at the level crossing.

Rationale: To reduce the risk of the site-specific assessment failing to consider factors which influence hazards at the level crossing.

3.6.3

Where the existing TSRs are not fully effective at managing the hazards present at the crossing, consideration should be given to the potential to reduce train speeds further to enable the TSRs to become fully effective. Where this is unsupportable, for example, due to a significant adverse performance impact, it may be appropriate to bring a Vamos crossing system into service with the current IMC040 boards.

3.6.4

Where the existing TSRs are having a negative impact on another level crossing in the vicinity, for example, by creating excessive or inconsistent warning times, it may be appropriate to bring a Vamos crossing system into service with the current IMC040 boards.

3.6.5

The vulnerability of the Vamos crossing system to a wrong side failure is influenced by the following factors:

a) The proportion of time the Vamos crossing system would be expected to display a red aspect to level crossing users. This is relevant because the greater this proportion of time is, the greater the "window of opportunity" for the wrong side failure mode to present itself. The proportion of time the Vamos crossing system would be expected to display a red aspect to level crossing users is influenced by:

   a. The number of trains traversing the level crossing,

   b. The required warning time,

   c. Actual train speeds approaching the level crossing and the magnitude and frequency of variations from the permitted speed,

   d. The presence of signals, stations or other stopping places near the level crossing.

b) The type of level crossing users

c) The number of level crossing users

d) The track condition in the vicinity of the level crossing. In this context track condition includes the formation and ballast, etc. Repeated significant movement of the track when trains are passing (for example, as a consequence of voiding) may lead to the fixings securing the strike-out wheel sensors to the rail to work loose which is a known precursor to a wrong side failure mode.

e) The degree of protection afforded to the cables associated with the strike-out wheel sensors. Damage to these cables may be a precursor to a wrong side failure mode and cables lying on the ballast are particularly vulnerable to damage. Cables can be protected by housing them within a cable trough route or similar.

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

3.6.6

Other factors which may be relevant to consider at a specific level crossing include:

a) Any other site-specific hazards which could be mitigated by a Vamos crossing system.

b) The projected improvement in Fatality Weighted Index (FWI) arising from Vamos crossing system introduction (taking account of the wrong side failure potential).

c) Any known issues regarding user behaviour which might be impacted by the provision of a Vamos crossing system.

3.6.7

Where enhancements which are not related to changes in speed restrictions are proposed, the site-specific assessment shall consider the following:

a) The effects of the proposed enhancement on the hazards present at the level crossing,

b) The extent to which a Vamos crossing system will be effective in managing those hazards,

c) The vulnerability of the level crossing to a wrong side failure of the Vamos crossing system,

d) Any other site-specific factors that influence the risk at the level crossing.

Rationale: To reduce the risk of the site-specific assessment failing to consider factors which influence hazards at the level crossing.

Note: For guidance on items c) and d) in this requirement, refer to sections 3.6.5 and 3.6.6.

3.6.8

Where the level crossing is not located in a long signal section, the site-specific assessment shall consider the following:

a) Whether the current method of working requires any crossing users to contact the signaller for permission to cross,

b) The extent to which the current method of working is effective at managing the hazards that exist at the level crossing,

c) The vulnerability of the level crossing to a wrong side failure of the Vamos crossing system,

d) Any other site-specific factors that influence the risk at the level crossing.

Rationale: To reduce the risk of the site-specific assessment failing to consider factors which influence hazards at the level crossing.

Note: For guidance on items c) and d) in this requirement, refer to sections 3.6.5 and 3.6.6.

3.6.9

If crossing users do not have to contact the signaller for permission to cross, the length of the signal section has limited relevance to the current risk profile of the level crossing.

3.6.10

The effectiveness of the current method of working can be influenced by a range of factors, including:

a) The proportion of crossing users who are instructed to seek permission to cross from the signaller,

b) The extent to which those crossing users who are instructed to seek permission to cross actually do so (this can be assessed by comparing evidence of actual level crossing usage with records of communication with the signaller),

c) The signaller's workload,

d) Whether there are crossing users who use the level crossing multiple times during the day (as they may be less likely to seek permission to cross),

e) The potential for more than one train to be approaching the level crossing at broadly the same time (as there is a risk that a crossing user may see the first train pass and assume it is now safe to cross, putting them in the path of the second train),

f) The length of time which crossing users typically have to wait at the level crossing.

3.6.11

The findings of the site-specific assessment shall be documented in preparation for a peer review.

Rationale: To provide an audit trail of decision making.

There is no mandatory template for recording the issues considered and outcome of the decision process, however, adopting a format which provides clear traceability to the factors highlighted in section 3.6 enables subsequent readers of the document to confirm that all the relevant issues were considered.

The next step in the process is covered by section 3.7.

3.7 Peer Review of Site-specific Assessment

3.7.1

The findings of site-specific assessments shall be peer reviewed at the national Control, Command and Signalling (CCS) variations panel meeting.

Rationale: To achieve a consistent approach to the judgements which underpin the site-specific assessment activity and share good practice across NR.

The national CCS variations panel meeting meets weekly on Monday afternoons. To request an agenda slot to present a site-specific assessment, contact Signalengineers@networkrail.co.uk

It is good practice for the author of the site-specific assessment, or other knowledgeable individual who has been involved in its production, to attend the national CCS variations panel meeting to present the assessment and respond to feedback from the panel.

3.7.2

The conclusions of the peer review discussion shall be documented and shared with the relevant Route Engineer (Signalling) and Route Level Crossing Manager, or equivalent roles.

Rationale: To provide a record of the discussion, any recommendations identified and the support (or otherwise) of the panel for audit purposes and to inform the Route's subsequent decisions on how to proceed.

It is good practice to add the record of this discussion to the site-specific assessment document.

The next step in the process is covered by section 3.8.

3.8 Site-specific Assessment Conclusions

3.8.1

The Route Engineer (Signalling) and Route Level Crossing Manager, or equivalent roles, shall use the findings of the site-specific assessment and the conclusions of its peer review to decide whether it is appropriate to bring a Vamos crossing system equipped with the current IMC040 boards into service at this level crossing.

Rationale: To confirm that the key accountable roles for asset and risk management at the level crossing are satisfied with the outcome of the site-specific assessment activities.

It is good practice to record this decision in the site-specific assessment document.

3.8.2

If it has been decided not to bring a Vamos crossing system equipped with the current IMC040 boards into service, the next step in the process is covered by section 3.10

If it has been decided that a Vamos crossing system equipped with the current IMC040 boards can be brought into service, the next step in the process is covered by section 3.9.

3.9 Bringing a Vamos Crossing System Equipped with the Current IMC040 Boards into Service

3.9.1

In addition to level crossings which have received positive support for entry into service through the site-specific assessment activities set out in sections 3.6 to 3.8, it is considered that level crossings which reach this step in the decision process will typically include those at locations where one or more of the following conditions apply:

a) The level crossing is located in a long signal section resulting in the signaller having a limited awareness of train position relative to the exact location of the level crossing,

b) The level crossing has a history of persistent abuse or near misses for which the absence of an active warning system has been identified as a contributory factor,

c) Signaller workload is high and the introduction of the OMSL is intended to materially reduce workload.

3.9.2

Vamos crossing systems equipped with the current IMC040 boards may be brought into service at level crossings which reach this step in the decision process, subject to the agreement of the Route Engineer (Signalling) and Route Level Crossing Manager, or equivalent roles in accordance with requirement 3.1.3.

3.9.3

Section 4 sets out requirements which apply to the entry into service activities for Vamos crossing systems equipped with the current IMC040 boards.

3.10 Consider Alternative OMSL Systems

3.10.1

Where it has been identified that it is not acceptable to bring a Vamos crossing system equipped with the current IMC040 boards into service, consideration can be given to installing an alternative OMSL system. Factors to consider in deciding whether to pursue this option include:

a) The availability of a product accepted OMSL system which is suitable for application at the level crossing in question.

b) Whether the local maintenance personnel hold the relevant competencies to maintain an alternative OMSL system (or whether it is feasible to train them in the maintenance of the alternative OMSL system to gain the required competence).

c) The requirements for stock holding of spare parts for an alternative OMSL system.

d) The relative timescales for installing an alternative OMSL system and the IMC040A boards becoming available for the Vamos crossing system.

3.10.2

If it is concluded that using an alternative OMSL system is not feasible, the next step in the decision process is covered by section 3.11.

If it is concluded that an alternative OMSL system can be used, the next step in the decision process is covered by section 3.12.

3.11 Delay Vamos Crossing System Entry into Service Until IMC040A Boards Become Available

3.11.1

This section applies where it is determined that a Vamos crossing system is the appropriate solution for the level crossing in question, but it is determined that it is not appropriate to bring it into service with the current IMC040 boards.

In this situation, the existing control measures will continue to apply at the level crossing until the IMC040A boards become available. This prevents the implementation of any speed restriction changes or other enhancements which are dependent upon the availability of an OMSL system at the level crossing.

Although the Vamos crossing system cannot be brought into service until the IMC040A boards become available for installation at this crossing, it is permissible for many elements of the Vamos crossing system to be installed in preparation for this provided that these do not cause an obstruction or present misleading information to level crossing users in the interim period.

Note: Signage changes associated with the introduction of the Vamos crossing system cannot be implemented until the Vamos crossing system itself is brought into service. Covering over visual and audible warning devices avoids their presence misleading crossing users to expect a visual or audible warning.

3.12 Implement an Alternative OMSL System

3.12.1

This section applies where a decision is made to implement an alternative OMSL system.

In this situation, the alternative OMSL system is implemented and brought into service in accordance with the requirements applicable to its use.

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

4 Entry into Service Conditions for Vamos Crossing Systems Equipped with the Current IMC040 Boards

4.1 Installation Activities

4.1.1

Nord-Lock NLX24 locking washers shall be used on the M24 fixings which secure each rail claw to the rail.

4.1.2

A torque of 200Nm shall be applied to the M24 fixings which secure each rail claw to the rail.

Rationale: These requirements are to mitigate the risk of a wheel sensor becoming loose on the rail, which is a known precursor to a wrong side failure mode. They also contribute to an installation which is consistent with the existing Vamos crossing systems as modified through the actions specified in Special Inspection Notices (SINs) NR/SIN/211 and NR/SIN/212 and the good practice set out in Notice Board 215.

Each wheel sensor is mounted in a rail claw. The rail claw enables the wheel sensor to be fitted to the rail.

Notice Board 215 provides further details of the Nord-Lock locking washers, including part numbers.

4.2 Commissioning Activities

4.2.1

Indelible marks shall be applied, using a paint pen, correction fluid or similar, to the M24 nuts and bolts securing each wheel sensor rail claw to the rail as part of the commissioning of the Vamos crossing system.

Rationale: To support future visual inspections of the security of the rail claw fastenings. This also contributes to an installation which is consistent with the existing Vamos crossing systems as modified through the actions specified in NR/SIN/211 and NR/SIN/212.

4.2.2

The integrity of the strike-out wheel sensor cables and security of cable terminations shall be checked as part of the commissioning of the Vamos crossing system.

Rationale: To mitigate the risk of a damaged or insecure cable being brought into service as these may be precursors to a wrong side failure mode.

4.3 Maintenance Preparations

4.3.1

Before a Vamos crossing system equipped with the current IMC040 boards is brought into service, the temporary Service A added to NR/SMS/PartC/LC71 shall be scheduled for the level crossing concerned.

Ref:	TI 184 – Appendix A
Issue:	1
Date:	4th September 2023
Compliance date:	29th September 2025

Rationale: The temporary Service A inspection regime is a mitigation for the hazard of the wrong side failure mode of the IMC040 boards.

For details of the temporary Service A, refer to Appendix B of TI184.

4.3.2

Before a Vamos crossing system equipped with the current IMC040 boards is brought into service, arrangements shall be made for the Vamos crossing system concerned to report into the Dogfish remote monitoring system.

4.3.3

Before a Vamos crossing system equipped with the current IMC040 boards is brought into service, the Dogfish remote monitoring system shall be configured to send notifications relating to that Vamos crossing system to at least two nominated recipients within the Route organisation.

Rationale: The regular monitoring of remote monitoring information from the Vamos crossing system by appropriate personnel is a mitigation for the hazard of the wrong side failure mode of the current IMC040 boards.

NR currently uses Dogfish as the remote monitoring system for Vamos crossing systems.

Typically, the nominated recipients of the remote monitoring information are roles within the maintenance organisation which have the ability to check for alarms on a regular basis and can arrange prompt attendance by a maintenance team in the event of the Vamos crossing system reporting that it has entered dark mode.

TI184 – Appendix B

Addendum to NR/SMS/PartC/LC71

Includes:	Vamos Crossing System
Excludes:	All other Types of Level Crossings

The checks in service A reduce the risk of a wrong side failure of the Vamos crossing system occurring. It is important that any defects or issues found during service A are reported and rectified promptly to maintain the integrity of the Vamos crossing system.

Protection/Possession arrangement shall be taken before commencing work on the Level Crossing System.

SERVICE A

1. Mechanical and visual check of strike-out wheel sensor RSR123

1.1 Identify the strike-out wheel sensor for each line over the crossing.

1.2 Check that the witness marks on the M24 rail claw nut and bolt are in alignment, indicating that the rail claw is securely fastened to the rail. If they are not aligned:

a) Remove the old witness marks

b) Remove the M24 nut and Nord-Lock washer.

c) Inspect the Nord-Lock washer for signs of damage. Undamaged washers can remain in use. Damaged washers are to be removed, and a new washer inserted (if you do not have a new washer available, reuse the existing washer and report this to your SM(S) so that they can arrange for it to be replaced within 4 weeks). When reusing an existing washer, make sure to fit the two parts with the matching cam faces against one another as shown in green box within Figure 1 below. The narrower serrations should be on the outside faces of the assembled washer.

NOTE: *Washers are considered to be damaged if the inner cam faces or outer serrations are rusted, partially damaged or significantly worn.*

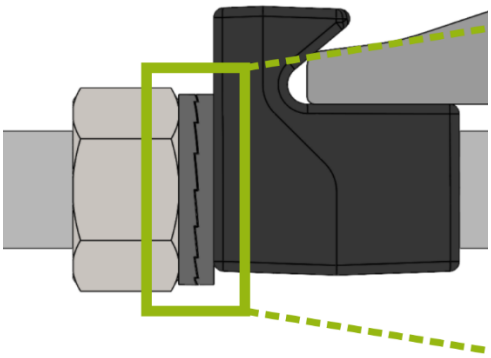


Figure 1 – Nord-Lock washer

d) Fit the new or re-used Nord-Lock washer onto the M24 threaded bar with the domed side of the washer facing outwards. Refit the M24 rail claw nut.

e) Tighten the M24 rail claw nut to 200Nm

f) Complete a Wheel Sensor calibration check as per NR/SMS/PartC/LC71 Service B Part 6

g) Apply new indelible witness marks to the M24 rail claw nut and bolt assembly

h) Complete a Detection Capability Test as per NR/SMS/PartB/Test157

i) Complete a Sequence Test as per NR/SMS/PartB/Test159

j) Report the misalignment and action taken to your SM(S). The SM(S) should report this to the Route Engineer (Signalling) or equivalent and to signalengineers@networkrail.co.uk for trend analysis.

1.3 Examine the wheel sensor rail claw and fixings for heavy soiling, security and external damage.

1.4 Check the area around the wheel sensor (within 2m) is free of such items as:

a) Visible P/way defects

b) Metallic debris

c) New/scrap rails in the four/six foot or cess

d) Traction bonds

e) Excessive ballast

Any issues or objects of concern in the area around the wheel sensor that cannot be rectified shall be reported to your SM(S).

Any identified misalignment of the M24 rail claw fixings that cannot be rectified during this Service shall be reported to fault control and your SM(S) for appropriate action.

2. Visual check of cables and Trackside Connection Box (GAK) for strike-out wheel sensor

2.1 Check the GAK is secure in the ground, undamaged, and the lid secure.

2.2 Remove the cover and examine the security of cable connections.

2.3 Check cable glands and ties. Unused cable entry points should be sealed.

2.4 Check the cable from the GAK to the wheel sensor is undamaged.

2.5 Check the cable from the GAK to the Vamos cabinet is undamaged.

The main focus of this check should be those sections of the cable between the GAK and Vamos cabinet which are not within a cable troughing route.

Any issues or defects identified through these checks that cannot be rectified shall be reported to your SM(S).

Any cable damage identified shall be reported to fault control and to your SM(S) for appropriate action.

END