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Level 2

Signalling Principles Handbook – Signal Spacing

Endorsement and Authorisation

For endorsement and authorisation, please refer to
NR/L2/SIG/30009

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Issue record

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Compliance

This Network Rail standard is mandatory and shall be complied with by Network Rail and its contractors if applicable from 6th March 2010.

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

Reference documentation

[GK/RT0034](#) Lineside Signal Spacing

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1 Purpose

This section forms part of the Signalling Principles Handbook (NR/L2/SIG/30009) and is to be read in conjunction with the other modules of the handbook.

This Section details Network Rail's policy on the spacing of signals and selection of appropriate braking rates for different types of train and comprises mandatory sections, statements of best practice (which shall be followed unless an alternative can be demonstrated to be beneficial to the company and no less safe), and guidance on historical practices (which are not to be applied to new works but provide information on previous standards or their interpretation).

2 Scope

This specification applies to all signalling schemes and detailed design where signals are provided, relocated or the aspect sequence is amended.

3 Definitions

3.1 Minimum signal spacing distance:

The calculated minimum distance between the signal displaying the first caution aspect and the signal at which the train is required to stop.

3.2 Actual signal spacing distance:

The actual distance between the signal displaying the first caution aspect and the signal at which the train is required to stop.

3.3 Excess signal spacing:

The distance by which the actual signal spacing exceeds the minimum calculated signal spacing.

4 Background

Signal Spacing (or braking distance) is derived from a number of curves based on the type of traffic authorised to travel at a permissible speed. Where there are differential speeds then the signal spacing is established from the greatest of the distances for each category of train based on the differential speeds.

It is essential that the correct curve and associated lineside signage is selected for the type of traffic that is authorised to operate over each line where the signal spacing is to be altered. The following sources of information shall be used:

- The Electronic Sectional Appendix (NESA) contains details of all types of locomotives, multiple units, coaching stock and wagons authorised to operate over a route;
- Rule Book Module SP which contains information on which lineside signs may be used to indicate to drivers the permitted speed for the various groups of train types. This information should be considered when selecting the signage appropriate to the signal spacing and the types of rolling stock to be operated;

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- c) The Sectional Appendix also details any local arrangements that may also apply.

Projects which are amending the signal spacing or the permissible speeds shall consult the Sectional Appendix to identify which classes of train are authorised to operate over the route and any restrictions which may apply. Projects shall seek confirmation (through the mechanisms described in GE/RT8270) from the Railway Undertaking(s) having access rights (whether exercised or not) to the lines where alterations are proposed that any rolling stock affected by the changes can achieve the intended braking distances. (It is likely that the Railway Undertaking will do this by reference to the appendices of GM/RT2041 & GM/RT2042 for locomotive hauled stock, GM/RT2043 for freight trains and GM/RT2044 for multiple units).

NOTE It must NOT be assumed that just because rolling stock is listed in a particular category within Module SP of the Rule Book, that rolling stock can actually achieve the braking distances for the normally applied appendix of GK/RT0034 (see 5.2 of this standard) without verification from the train operator.

There are also situations where it is not possible to place the signals at the ideal positions leading to under braking, over braking or uneven spacing. There are various techniques for managing the risks associated with these issues, some of which are non-preferred.

5 Requirements for Signal Spacing

5.1 Objective

The signal spacing distance allows all trains authorised to use a route to safely stop using a service brake application at a red signal from the first cautionary aspect when travelling at the highest authorised speed.

In order to achieve the headway and journey time requirements, which are detailed in the Rules of the Plan and the Project Remit, it may be necessary to allow different types of trains to travel at different speeds. For each type of train, the signalling shall provide adequate distance for the train to stop from a first caution to a stop aspect. This may be achieved by providing signal spacings suitable for some trains with more efficient braking systems to travel faster than those with less efficient braking systems or by restricting the speed of trains unable to brake so quickly for a given fixed signal spacing.

The use of unsigned speeds (where restrictions or permissions are controlled by Sectional Appendix statements) is non preferred for new schemes.

Wherever possible, the spacing of signals should be consistent and special controls should be avoided.

Any change in speed profile (including the introduction or removal of differential speeds) needs to be assessed in accordance with NR/L2/SIG/30021.

5.2 Application of braking appendices

GK/RT0034 contains four sets of braking distance for differing types of train. The application of these is as follows:-

- a) Appendix A is applicable for all trains and provides sufficient distance for all passenger and freight trains to be braked to a stand. Where a single,