

# RAILTRACK

*Safety & Standards***SAFETY JUSTIFICATION****ISSUE: 2****DOCUMENT INFORMATION**

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**PART 1 – SCOPE OF SAFETY JUSTIFICATION**

GI/RT7006 is a new Standard, which specifies the high level requirements for the risk assessment of signal overruns. Together with GK/RT0064, which specifies the detailed requirements for overlaps, flank protection and trapping, GI/RT7006 replaces the previous Standard GK/RT0078 'Overrun Protection and Mitigation'.

The high level requirements of GI/RT7006 are supported by a Guidance Note GI/GN7606, which provides direction on the scope of the risk assessment, the selection and application of appropriate risk assessment tools and methods, the interpretation of the risk assessment results, and the criteria by which the risks associated with a signal layout are judged ALARP.

The development of GI/RT7006 introduces a comprehensive framework for risk assessment of layouts. In doing so it represents a significant change of emphasis, and it is therefore appropriate for the scope of Safety Justification to apply to the whole document, rather than focussing on the specific changes.

**PART 2 – RISKS BEING CONTROLLED**

The Standard mandates a structured and proportionate assessment of the risks from signal overruns. It requires that the risk information be used in the identification of suitable control measures such that the residual risks associated with the selected design option are demonstrably ALARP.

The main hazardous events of concern are train collisions and derailments arising from the following causes of signal overrun:

- driver misjudgement of stopping position;
- driver misread or disregard of signals;
- localised low adhesion problems such as those caused by grease or oil on the rails, but not leaf fall.

The risks addressed by this Standard are among the most significant on the Railtrack Controlled Infrastructure. The mandated risk assessment process is central to the management of these risks, but overall control is critically dependent on control measures mandated in other Railway Group Standards e.g. those associated with signal sighting, driver competence, train protection systems etc.

### **PART 3 SUMMARY OF CONTROLS**

The Standard provides a holistic framework within which the key hazards associated with signal overruns are assessed, and are controlled in conjunction with specific measures in other Railway Group Standards. The key elements of the Standard are summarised below.

- The Standard requires up-front analysis of potential design options for new or modified layouts, to ensure that risk based principles are adopted in the operational, permanent way, and signalling inputs to the design. Priority is given to the removal of risks at individual signals, and where this is constrained, to adopting control measures which reduce the risks to ALARP.
- Criteria are specified which, if met, obviate the need for further risk assessment. These criteria simplify the risk assessment process by removing routes through the layout for which a more detailed analysis would only confirm that the risks are already ALARP e.g. where TPWS is fitted, with an overlap sufficient to prevent trains reaching a conflict at speeds up to the permissible speed.
- Where further risk assessment is necessary, the mandated process requires that, for every stop signal, the risks are evaluated in terms of the likelihood of overrun, the extent of the overrun, and the consequences in the event of a collision or derailment. The rigour of the assessment is required to be commensurate with the level of risk. The Guidance Note provides direction on the selection and application of appropriate methods and on the tolerability criteria against which ALARP decisions may be taken.
- The operational use of the layout is constrained by the assumptions made in the risk assessment. Significant changes to the operation of the layout or changes to the infrastructure require that the overrun risk be reviewed. All layouts are required to be reviewed at least once every five years to check the adequacy of existing control measures and the cumulative effect of minor changes to the operational use of the track and signalling.
- Additional control measures specified in the Standard require that:
  - procedures are implemented for the risk assessment, the identification of design options, and the review of operational and infrastructure changes;
  - records are maintained on the design options considered, the assumptions made about the infrastructure and operational aspects of the layout, and the review leading to the selection of a particular design;
  - the approved control measures are implemented in the design and in the appropriate operational procedures;
  - competent persons are engaged in the risk assessment and reviews;
  - data and risk assessment tools are fit for purpose;

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### **PART 4 – COSTS AND BENEFITS**

The development of GI/RT7006 is a significant component in the establishment of an effective hierarchy of signalling related Standards, from which the following safety benefits are anticipated:

- The Standard, supported by guidance provided in GI/GN7606, will ensure that risk based principles are adopted from the outset of the design through to the selection of a particular option. This creates the potential for building in good practice throughout the design process, particularly in the early stages when the latitude for introducing effective control measures is greatest.
- An emphasis is placed on eliminating catastrophic risk for routes throughout the layout, for example, by designing out the potential for head-on collisions.

- The Standard mandates a structured and iterative process in which the detail of the risk assessment is proportionate to the level of risk, and which progressively leads to the adoption of designs which are demonstrably ALARP.
- Changes to the operations of the track and signalling will be monitored and controlled.

A key objective of the Standard is to influence the way in which design options are identified, assessed and selected. This may shift costs to an earlier stage in the design process, but it is judged that overall costs of compliance will not exceed those currently incurred. In fact, it is more probable that making the design phases more concurrent will introduce the potential for cost savings in the process of layout selection, and will also provide an implementation which has greater operational effectiveness, as well as a high level of safety.

A further objective is to ensure that operational changes are effectively controlled, through either a review prompted by a significant change, or a five-year review to monitor the cumulative effect of minor changes. The latter is a new requirement for the industry to accommodate, the costs of which may be significant. However the structure of the risk assessment process is designed such that extent of the review is proportionate to the changes, in which case the requirements do not go beyond those required to demonstrate that the risks are ALARP.

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## **PART 5- CONCLUSIONS**

GI/RT7006 is a new Standard which provides a high level framework for managing the risk of signal overruns, and effectively replaces the previous Standard GK/RT0078. Detailed interpretation of the high level requirements is provided in the supporting Guidance Note GI/GN7606. The Standard promotes good practice when designing new or modifying existing layouts, or when making changes to operations or the infrastructure. The cost implications are judged to be minor, except for the new requirement to conduct five yearly reviews on existing layouts, in which case the scope of the review is designed to be commensurate with the changes that have been implemented, and is therefore a necessary requirement in demonstrating that the risks remain ALARP. On this basis it is concluded that the control measures specified in GI/RT7006 are justified.