

RAILTRACK

*Safety & Standards***SAFETY JUSTIFICATION****ISSUE: I****PART 1 - DOCUMENT INFORMATION**

Document Title:	Electrified Lines Traction Bonding		
Document No:	GL/RT1254	Issue:	One
Primary Subject Committee:	Electrification		
Other Subject Committee input/ involvement:	Train Control & Communications		
Proposed Date of Submission to Subject Committee:	13/01/2000		
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PART 2 - EXECUTIVE SUMMARY

This is a new document, which amends and supersedes GM/RT1010. The changes that are proposed to GL/RT1254 take into account the requirements for high speed and tilting trains which in the context of this standard are related to the introduction of a new form of traction power supply system onto Railtrack controlled infrastructure. The primary objective of the redraft of the document was to make it generic and therefore applicable to any sort of traction power supply system.

This safety justification describes the measures necessary to control the risk of propagation (export) of stray currents from DC electric traction systems with particular reference to the additional hazards presented by dual-electrified DC / AC interfaces and the interfaces between forms of traction power supply systems.

PART 3 - BACKGROUND**Need for change**

GM/RT1010 was reviewed against the background of higher speed (in excess of 125mile/h); tilting operations and the introduction of a new traction power supply system. This review identified that the following needed further consideration:

- The requirement to bond of all return current circuits to earth as this is inappropriate for some traction power supply systems such as the auto-transformer power supply system;
- Control of the risk of signalling rails becoming live from inadvertent contact with live conductors;
- Management of the risk caused by failure of traction bonding.

Proposed changes

- Withdrawal of GM/RT1010 Issue One - Electrified Lines Traction Bonding
- Introduction of GL/RT1254 Issue One - Electrified Lines Traction Bonding

The Standard has been re-categorised to reflect its application to multi-disciplinary infrastructure activities, and the following requirements have been added to the original Standard:

- Changes to align the definitions and principles with EN 50122-1;
- The need for the Infrastructure Controller to identify those failures in the stray current control measures which will lead to a hazardous state;
- The control of the risk when signalling rails becoming live with faults from live traction conductors;
- The need to review and upgrade the traction bonding if the traction load current or short circuit current is increased;
- The need for the design of traction bonding for electric traction systems to take into account the need to avoid interference with train control and communication systems and the special arrangements necessary at interfaces with other electrified and non-electrified railways.

Controls and their function

These measures are complimentary to those contained within GL/RT1253 in that they control the propagation or export of DC stray current from DC electric traction systems. The standard mandates maximum values for accessible and touch voltages and ensures the specific requirements to reduce the risk of arcing and hence explosion at installations where inflammable gases or liquids are transferred are maintained. They also require the Infrastructure Controller to establish the safety criticality of the bonding arrangements and to institute systems or procedures to correct failures based on risk assessments.

Part 4 - COSTS AND BENEFITS

The proposals clarify existing requirements and additionally require processes to be in place to ensure that the bonding arrangements are recorded and maintained in accordance with the design standard. The latter activity is not expected to cause additional cost as they are normal activities associated with engineering practice. They also include a requirement to review the traction bonding arrangements if load current or short circuit current is increased. This need is likely to be driven by a business led route upgrade to permit higher speed or more intensive use of the network and as such the costs are de facto a component of this upgrade and not an additional cost arising from the introduction of GL/RT1254.

Part 5 - CONCLUSION

The proposals are necessary to control the risk of electric shock from accessible and touch voltages, direct interference with train control and communication system and the detrimental effects of stray currents.

Part 6 - REFERENCES

EN51022-1