

# RAILTRACK

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

<b>Document Title:</b>	<b>Verification of Electrification Systems and Interactions with other Systems</b>		
<b>Document No:</b>	GE/RT8016	<b>Issue:</b>	One
<b>Primary Subject Committee:</b>	Electrification		
<b>Other Subject Committee input/ involvement:</b>	Train Control & Communications		
<b>Proposed Date of Submission to Subject Committee:</b>	13/01/2000		
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<b>Controller, Safety, Strategy and Planning</b>			
<b>Approved by:</b>		<b>Date:</b>	
<b>Controller, Railway Group Standards</b>			

**PART 2 - EXECUTIVE SUMMARY**

This is a new document, which amends and supersedes GM/TT0111. The changes to GM/TT0111 which have been incorporated into GE/RT8016 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 current standard is quite prescriptive and references the existence of a document entitled "The Specification for the Route" however the production of this document is not mandated. This is addressed in the new document by requiring that a process be followed to verify the correct performance of the installed system. The redraft of the document has made it less prescriptive, performance based and generic and therefore applicable to any sort of traction power supply system.

**PART 3 - BACKGROUND****Need for change**

GM/TT0111 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 significant modification of existing measures within the document was required to make it effective. The main concerns were:

- The current document requires the existence of a document called the Specification for the Route but the production of this document is not mandated;
- The absence of acceptance criteria or the need to produce and agree such criteria before commencement of test.

It was also identified that the scope of the document could be expanded to include DC electrification by making the requirements non-system specific.

**Proposed changes**

- Withdrawal of GM/TT0111 Issue One – 25kV AC Electrification – System Proving and Integrity Testing

- Introduction of GE/RT8016 Issue One - Verification of Electrification Systems and Interactions with other Systems

The document has been categorised to reflect its application to multidisciplinary activities affecting Railway Group members and the scope and content have been amended so that it applies to all electrification systems. Therefore the proposed requirements have been written using generic terminology. Additionally measures to control the interactions between the electrification system and other infrastructure systems have been amended and are now included in a specific section within the document. The proposed structure of this new document is:

- Purpose
- Scope
- Definitions
- Electrification System Verification
- Verification of interactions with other Systems
- Periodic Verification of the Electrification System and Interactions with other Systems

### **Controls and their function**

The principles that have been adopted can be summarised as:

- Verification that the installed electrification system meets the design criteria;
- Verification that the installed electrification system introduces no undesirable effects in other infrastructure systems;
- Periodic verification that the installed system continues to meet its design criteria and no undesirable effects are being created in other systems.

Where the verification activity identifies that residual risk exists then the document requires this be managed.

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### **Part 4 - COSTS AND BENEFITS**

The document mandates measures which are considered to be best practice within the systems engineering field. No additional costs should therefore be created by the introduction of this document.

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### **Part 5 - CONCLUSION**

A review, of the current 25 kV AC Electrification – System Proving and Integrity Testing standard, highlighted shortcomings in a number of areas. It was also recognised that by making the measures generic then the scope could be expanded to include all forms of electrification system including the auto transformer system and DC electrification systems. The proposed document corrects this situation and is applicable to all forms of electrification.

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### **Part 6 – REFERENCES**

GM/TT0111