

(ITT2B)

Scenario: Electromagnetic Compatibility (EMC)

Question

1. Background

1.1 Transport for London's Railway¹ EMC environment is complex and diverse. It contains the full range of railway, heavy and light industrial environments, characterised by Rolling Stock, Safety Critical systems (signalling and control), fixed and mobile communications equipment, electrical power infrastructure, and external interfaces with adjacent railways and residential environments.

1.2 Any equipment must therefore operate safely and meet its legal and contractual performance requirements for Transport for London's operating environment. It is also essential that equipment can operate safely under normal and credible failure conditions without affecting, or being adversely affected by, the operation of other equipment, which include pre-existing TfL and third party equipment that may pre-date the EMC Directive.

1.3 The key for TfL is to meet its legal obligations. To satisfy the above criteria requires experienced, confident and competent engineers with railway domain knowledge.

2. The Requirements

2.1 TfL is seeking specialist support to deliver Electromagnetic Compatibility Assurance for the design and delivery. Working closely with programme teams with the aim to deliver programmes with the necessary Assurance under contractual terms, to enable TfL meet its legal obligations.

2.2 The specialist will be expected to develop and implement EMC solutions across a wide range of assets including large and complex fixed installations, signalling, Rolling Stock, and so the need of best practice, a risk based and pragmatic approaches will be paramount

2.3. The EMC Assurance delivered by the specialist shall meet Transport for London's EMC requirements, which include the essential requirements of the

¹ Comprising of The London Underground (LU) , and the wider Network: Docklands Light Railway (DLR), Elizabeth Line, The Overground, Tram.

European EMC Directive² and when applicable the essential requirements of the Radio Equipment Directive² (RED) and Electromagnetic Fields Directive² (EMF). The specialist will also be expected when applicable to be responsible for the Safety Case on the Railway.

3. Key Accountabilities

3.1 Managing EMC delivery, ensuring adequate risk based assurance is provided to support LU in meeting their legal obligations.

3.2 Addressing EMC from a Systems integration of the multi-disciplinary design within the operational transport mode (i.e. railway or surface transport).

3.3 Establish and maintain good working relationships with programme team, discipline engineers, end user representatives, other third party suppliers, and any other stakeholders.

3.4 Oversee planning processes and ensure appropriate milestones are identified, robust schedules are created and maintained in accordance with corporate requirements and system. Ensure requirements and dependencies are understood and appropriately specified, managed and implemented, both within the Programme and with other Programmes and activities across the business. Ensure milestone risks and issues are actively managed in accordance with TfL procedures and escalated in a timely manner where necessary.

3.5 Provide technical input and advice to the project,
Liaising closely with all Transport for London mode specialist discipline engineers during the design process to ensure that Interfacing with other disciplines e.g. premises, fire, civil / structural, communication systems, signals, track, power engineering and operations, etc are addressed.

3.6 Delivery of EMC Assurance which may include but is not limited to:
generating EMC control/test plans, design reviews, surveys, risk assessments, calculations and modelling, EMC measurements, Hazard ID and managed associated risks, retrieving Declarations of Conformity and supporting evidence of compliance, Earthing and Bonding, and compilation of the EMC Technical File.

3.7 Provide assurance to Neighbouring Railways that the impact of EMC has been considered.

² The said European Directives are transposed into Secondary Legislation in the UK.

3.8 Capability in challenging traditional design approaches to deliver a sustainable EMC design.

4. **Response Content**

4.1 To demonstrate your competence you are required to, in no more than 1500 words contained in a maximum of 4 sides of A4 (pictures, diagrams etc. may be included in the sides of A4 limit), describe the EMC engineering process and activities you would use to provide EMC assurance for a fixed railway installation of your choice. Your proposal should consider the following:

- Your choice of a fixed installation and a justification for its selection;
- Your overall approach to EMC delivery;
- Proposed programme management structure and high level governance arrangements, and approach to tracking and reporting progress;
- Proposed resources of key personnel giving evidence of appropriate skills, knowledge and experience;
- Your understanding of critical success factors (acceptance criteria)
- Your view of typical key lifecycle risks and technical issues affecting successful delivery. How are these managed?
- Your selection and justification of suitable standards;
- What steps are required to migrate and maintain assurance from an apparatus to a fixed installation;
- Your typical approach to EMC integration planning, giving an example of the content of key planning documentation;
- Your typical approach to defining acceptance criteria.
- A list of documentation you would produce.
- Identify what are the key requirements for a fixed installation.