

## **ITT2B -Scenario: R&R TCS Electronics**

### **Question**

#### **1. Background**

Electronics is equipment that contains circuit boards, circuitry and components that are used for transmitting or processing analogue and/or digital data. On the TfL estate this ranges from hand-drawn and built circuitry from the 1950s to modern microprocessor based systems with surface mount construction. TfL are seeking specialist support to undertake electronics design to support delivery and maintenance projects, primarily for signalling and fleet. The scale of this scope could be from a single design for one-off use through to design changes and upgrades that have network-wide implications.

There is a need for support for state-of-the-art new equipment and designs but also for older systems using uncommon and often, obsolete technology.

The design support shall also include provision for supporting assurance documentation for the proposed design, demonstrating adherence to relevant standards and safety assurance processes. The supporting assurance documentation could also include on-site testing and surveys through to lab development, design and testing.

#### **2. Key requirements**

The supplier will be expected to supply advice, studies, reports, and design services which will in turn, depend on skill, competence and capabilities including but not limited to the following:

- Electronics design & documentation.
- Electronics CAD and simulation tools.
- Testing, reverse engineering and investigation.
- Standards for electronics design, manufacture, test, rework and repair.
- Safety assurance of electronics in safety and non-safety applications.
- Embedded software / firmware / hardware configuration for electronics.

It is desirable that the supplier has knowledge of electronics used in TfL network control systems, but knowledge of electronics in transport systems more generally will be sufficient when combined with a high level of general electronics skills and knowledge.

#### **3. Key Accountabilities**

Provide electronic design capability to support maintenance, overhaul and project activities, ensuring the appropriate standards are met and adequate assurance is provided to enable full implementation and commissioning of the design.

Identify key requirements from stakeholders, confirm remits and ensure dependencies with other work streams are understood and appropriately notified to the Employing Manager.

Providing technical input and advice to support the design submission and approvals, through to implementation, including the production and rollout processes.

#### **4. Scenario Question**

In no more than 1500 words, explain a typical design process for a replacement of an obsolete piece of electronics. Your response should include details of the following:

- Cost and/or reliability analysis in the case for replacement
- Your approach to requirements capture
- Details of any design proposal options considered
- The standards you decided to apply and why these were selected
- Details of the prototyping and type testing process
- Details of the safety assurance process
- A list of documentation produced
- How manufacture and quality assurance was achieved
- An outline of the handover and rollout process
- Critical success factors (acceptance criteria)