

Case Study - Sheffield Tram Train Pilot Scheme

THE CHALLENGE

The Tram Train Scheme was tasked with the design and construction of infrastructure and the agreement of operating and safety requirements to support the introduction of the UK's first low floor Tram Train service on the Network Rail heavy rail network which operates between Sheffield City Centre and Rotherham Parkgate Shopping Centre.

The project consisted of many aspects, including but not limited to: upgraded signalling, command and control systems; creation of a new station at Parkgate; introduction of low level platforms at Rotherham Central Station; bridge and parapet enhancements; introduction of overhead line equipment (OLE) and a new electrification system.

THE SOLUTION

Frazer-Nash Consultancy were tasked with developing the Infrastructure Safety Case on behalf of Network Rail, with Safety Justifications being developed for Operations, Signalling, Track, Traction & Rolling Stock; Electrification; Structures; Telecoms and the Low Level Platform. The major tasks performed by Frazer-Nash included:

- Production of a Safety Plan detailing the methodologies by which the project intended to ensure that implementation of the project is sufficiently safe.
- Production of a System Definition to describe and bound the system under consideration during the safety assessments.
- Facilitation of Hazard Identification workshops using a structured approach to identify all reasonably foreseeable hazards, which were then recorded in a project Hazard Record.
- Identification of Safety Requirements using the EU Common Safety Method for Risk Evaluation and Assessment (CSM-RA) Risk Acceptance Principles, including Explicit Risk Estimation (ERE).
- One such ERE related to the electrical clearances between the proposed 750V DC OLE and 3 bridges along the route and the High Level Platform at Rotherham Central Station. The method of Risk Assessment involved a number of steps which included:
 - Validation of clearance data and compliance with standards;
 - Identification of hazards and baseline levels of risk;
 - Identification of risk mitigation options and assessment of their effectiveness in terms of impact to safety, operations and the Network Rail business;
 - Cost analysis / ALARP assessment of the risk mitigations and recommendations to be addressed by the project.
- The output from the ERE concluded that a number of the bridges were compliant to applicable standards for electrical clearances (BS EN 50119) and earthing and bonding (BS EN 50122). Where the ERE concluded elements of the design were non-compliant and the resultant risk could not be shown to be acceptable, recommendations for costed design changes were made to the project team.

All of the above work was carried out in accordance with the CSM-RA.

THE BENEFITS

Frazer-Nash provided significant added value to Network Rail during the work conducted. Our experience in developing CSM-RA compliant risk assessments that achieve the required levels of approval enabled the Network Rail project team to maintain their commissioning programme with the required safety documentation in place to support it.

Client

Network Rail.

Business need

To demonstrate the costs and benefits of operating a standard continental design of Tram Train on the national rail network with a minimum level of adaptation.

Why Frazer-Nash?

Frazer-Nash Consultancy has a strong background in rail safety, particularly in the area of compliance with the EU Common Safety Method for Risk Evaluation and Assessment and the production of quantified explicit risk estimations.



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For more information about Frazer-Nash please visit our website.

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