

Stansted Tunnel Axle Counter



CASE STUDY



Overview of deliverables

The project was required to deliver a solution to repeated track circuit failures on the Stansted Tunnel, prior to the London Olympics. Failures of the train detection system, whilst undesirable under normal passenger loadings, would result in increased negative consequences during the anticipated demand peak during the Games.

Vertex were contracted to provide Project Delivery and Management services enabling integration of an improved train detection system solution (Siemens ACM100 Axle Counter) in the Stansted Tunnel within timescales of less than 4 months (prior to London 2012 Olympics). The innovative approach utilised and project completion within record timescales, resulted in this project being nominated for Rail Industry awards.

Vertex was responsible for providing Systems Engineering service to Network Rail, bringing together all parties to drive forward the development and assurance of the entire system. This included producing the business case and options for the project, driving the product approval of the required technology and integrating the assurance activities of all parties. As part of these works, Vertex also developed operational procedures required by the system in order to bridge the gap between Projects and Operations and thus ensure seamless Entry into Service.

Deliverables included:

- Systems Engineering- bringing together all activities of the stakeholders into an agreed framework process in order to ensure maximum results for minimum effort. Considerable fast-tracking/streamlining of standard processes was required in order to meet the project timescales;
- Management of interfaces with suppliers and designers;
- Accelerated delivery within Network Rail's project management requirements (GRIP), including risk management (project and Transport

- Safety System) through to project close-out;
- GE/RT8270 Compatibility Assessment;
- Options Analysis and Selection of a preferred solution, including Business Case validation;
- Integration into Network Rail's maintenance and faulting systems (FMS/ ELIPSE);
- Development and Management of Health and Safety File; and
- Monitoring of system during Olympic Games period and delivery of Critical Review Report.

Technical competencies applied in the delivery of the contract

- Vertex Engineers employed the following competencies during these works:
- Technical knowledge of the proposed system in question, incorporating over 20 years' experience with the implementation of axle counters. This includes both signalling and telecoms application requirements;
- Logistical Analysis of what could be delivered within the project timescales and within the available lineside access;
- Systems Engineering- appreciating the impact of the proposed solution in terms of its whole-life implementation. This included the 'hard' issues such as integration into the existing track-side tunnel environment and with the existing command/control systems, as well as 'softer' issues such as training, integration into existing management systems, maintenance requirements etc. The engineered solution is completely novel to Network Rail and therefore required careful implementation as all standards, documentation etc. had to be produced by the Project;
- Project Management, Stakeholder liaison and influence, in order to drive the project forward on the agreed timescales whilst maintaining stakeholder confidence; and
- Critical Review and FRACAS/DRACAS of the in-service performance of the solution during shadow running and finally in-service.

Value added initiatives

Due to the tight timescales, Vertex developed and agreed a streamlined systems-engineering framework with all parties. This approach identified the critical activities required and streamlined the Systems Engineering activities to ensure rapid delivery and full stakeholder buy-in to the fast-tracked programme.

As part of the initial works, Vertex drove forward the consideration of a new technology (to Network Rail) to solve the train detection problem. This involved the use of the Stansted Tunnel Project as not only an infrastructure upgrade but also as a spring-board for the introduction of alternative axle-counter suppliers to the business. As a result of these works, this new technology is now available to other users within Network Rail, contributing to supplier diversity and driving down long-term costs of procurement.

Programme start and completion dates

The project was necessarily constrained in its timescales by the requirement that any solution be tested and operational prior to the 2012 Olympics. Delivery slippage could not occur. Vertex successfully completed the works to enable the axle counter system to Entry into Service (having undergone shadow mode testing) in time for the 2012 Olympic Games.

Project dates was 3rd April 2012- July 2012, with the solution entering into service on the 14th-15th July, ahead of the 27th July deadline. The critical review report was submitted in January 2013, within the agreed timescale following commissioning.

Resources utilised

Vertex utilised its team of Railway Systems Engineers and Project Managers for this project. Qualifications held include membership of the Institution of Railway Signalling Engineers, Association for Project Management (APM) and professional Chartership (C.Eng.). Combined railway experience of the project team (4 persons) exceeded 60 years.

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