



Operational Design Review Process

Date: 26th August 2008

1. Introduction

The purpose of this document is to describe; the objectives of the operational design review process, how this interacts with the other project design review activities, the outputs from the review process and how these will be used by the project.

The purpose of the operational design review is to form part of the design review activity focusing on the compliance with ORR Guidance on Tramways RSP2 and the operational (including maintenance) requirements of the tramway. Review meetings will be held regularly to holistically assess the design from an operational perspective to highlight areas with regards to safety, reliability, compliance to the Employer's Requirements and to inform operational and maintenance procedures.

2. Objectives

The main objectives of the Operational Design Reviews are to review the whole of the tramway from an operational perspective in order to:

1. To identify those areas which need more detailed information or discussion before a subsequent 'no objection' can be demonstrated by **tie** to the ICP. Identifying the entity responsibly for providing the additional input.
2. To identify any 'show stoppers' where **tie** had to be immediately informed
3. To identify where the design is compliant, to allow **tie** to prepare a recommendation to the ICP that a 'no objection' to proceed to construction be given for that part.

3. Operational Design Review Meeting

The operational Design Review Meetings will be lead by Transdev's Engineering Manager and will be held on a regular basis. The meeting will initially be weekly with the frequency reviewed as the reviews progress.

The content of each review will be agreed at each previous meeting. The review meeting agenda will be determined based on the; emerging design, design assurance programme, approvals programme and Infracore construction programme.

The intention is to review both generic tramway design elements as well as reviewing each geographical section. Specific locations and design elements will also be selected for more detailed review based on the operational criticality and safety concerns.

Attendance will be invited from **tie**, Transdev, TEL and CEC. Attendance from SDS and BSC may be requested to provide additional explanation of the design that has been submitted.

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4. Focus of the review meeting

The main focus of the review will be compliance against RSP2 guidelines, Employer's Requirements and how previous design records of review have been addressed. The review meeting will also look at gaining an understanding of open issues raised during CEC's Prior and Technical Approvals exercises.

The following is a list of areas which are particularly important to tramway operations and maintenance and therefore can be used as a checklist in each review to ensure that the majority of important areas have been covered sufficiently:

Geographical Elements

- Marking and delineation of the tramway path in particular tram only areas and tram and bus only areas.
- Integration of the tramway with it's environment
- Line of sight principles
- Tramway Clearances
- Materials and finishes
- Tramway boundary treatment
- Turnout and crossover functionality
- Tram-way element of signalled junction functionality
- Tramway operational signage
- Track form and components/finishes from a maintenance perspective
- Location of tram-only signal heads and points indicators
- Vertical and horizontal alignment
- Design/operational Speed
- Tramway aspects of the Road Safety Audit
- Specific Hazard Log entries
- Top Event Risk mitigation (see below under evidence file)
- Location of Section Insulators, isolation points, poles and cabinets
- Drainage
- Cross-sections
- Landscaping
- Fencing and pedestrian deterrent where applicable
- Access for maintenance and pedestrian evacuation
- Lighting requirements

Specific Elements

- Tramstop layouts (identify a selection)
- Substation layouts (identify a selection)
- Haymarket staff facilities
- Depot

System wide elements

- Tramway signal and signage concepts
- Line of sight principles applied to the tramway design
- Track work specification and alignment principles
- Noise & Vibration
- Wheel/Rail interface
- SCC - (signals, TPDS, Points control, SCADA, PEHP, PID)
- Overhead line

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- Traction Power

5. Evidence File

The purpose of the evidence file is to document how the operational safety risks have been minimised as far as is reasonably practical. The operational safety risks are derived from formulation of the Top Event Risks and the Top Issues.

The Top Event Risks and Top Issues will be used in the operational design review to assess if risks have been removed by design mitigation. Areas will be identified where further design audits, statements, documents and/or risk assessments are required to provide evidence that the risk is mitigated by the design. This information will feed into the evidence file.

The operational design review process will also be used to highlight any new event risks or new issues that have not been previously identified; these will then be subsequently assessed as appropriate and feed into the evidence file.

6. Outputs from the Operational Design Review

After each review meeting a set of notes will be prepared by Transdev detailing:

- The agenda, attendance and general content of the review,
- Operational concerns which require further information,
- Operational concerns which require to be addressed,
- Areas where 'no objection' was raised for construction,
- New event risks or issues not previously highlighted,
- Operational procedures to be addressed,
- Maintenance procedures to be addressed.

The notes from each meeting will be circulated to the attendees for comment on content and accuracy. The review notes will then be sent to **tie** for circulation to BSC/SDS.

Feedback on issues highlighted in the review notes which require to be addressed or require further information from BCS/SDS must be submitted to **tie** before a recommendation can be given to the ICP to issue a 'no objection' to construction.

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