

■ Introduction

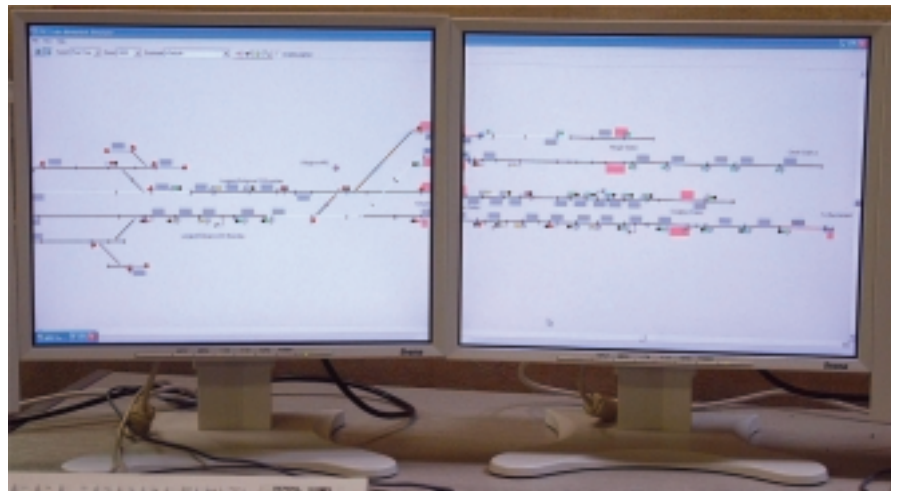
TRELEA is a reporting tool used in conjunction with the TRESIM signalling simulation system. Data collected during the running of a TRESIM scenario is collated by TRELEA, which then creates reports and graphs allowing the user to analyse various aspects of the simulated scenario. These include the effects of revising signalling standards, the implementation of SSI data, changes of the track infrastructure, and many other areas involved in signalling scheme design process.

The two principle elements are:

- The event logging package within TRESIM, that collects the timings of train running events, such as aspect changes, track circuit occupation, arrival and departure times at TIPLOCs etc, into a database.
- The analysis package TRELEA that permits the operator to interrogate the train running database in a productive manner.

The Intended Platform

TRELEA is intended to run alongside the TRE signalling simulation system.



■ Benefits

Overview

TRELEA provides for quantitative assessment of design options at an early stage in the design process, which yields two principal benefits with key commercial advantage:

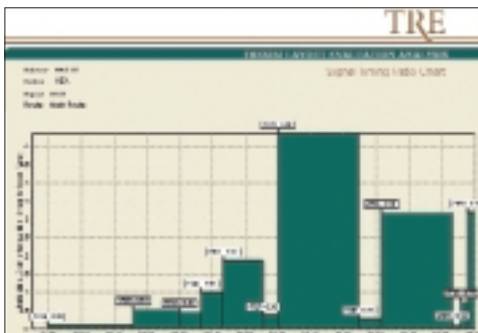
- Reduced overall cost through "right first time" design.
- Faster delivery of the completed scheme.

Using TRESIM and TRELEA in various ways can enable the signalling system design engineer to record many of the design issues underlying the implementation of a project. This results

in design issues being resolved at an early stage using processes that are appropriate to this stage of the system development. This saves significant amounts of both time, money and resource. Furthermore, projects that are completed quicker are less prone to top level system amendment. Simulation sessions can be saved and replayed for further inspection and later re-run using different evaluation criteria.

Scheme Plan Evaluation

During this phase, TRELEA can be used to report on the performance of the various scheme plan options using data from TRESIM simulations.



TRELEA Signal Data Chart

For information or a discussion about access to the knowledge of TRE:

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TRELEA, in conjunction with TRESIM, achieves this by offering:

- A powerful interlocking generation facility which provides for the latest signalling principles.
- An accurate train movement simulation which shows how the completed system would operate.
- The ability to reliably demonstrate whether a proposed timetable or pattern of train operation is feasible with the proposed layout.
- The ability to vary the level of detail and failures.

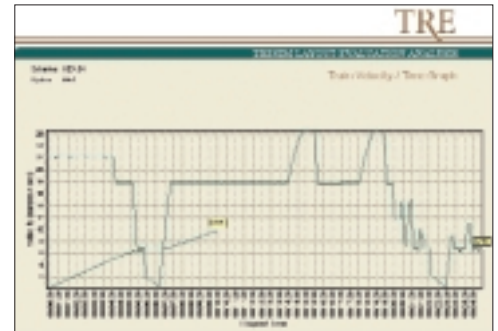
Signalling System Design

As major system design decisions are considered, TRESIM can be used to evaluate the consequences of making those decisions. For example:

- If it is proposed to use SSI as the interlocking, the TRESIM configuration system can be used to generate first draft SSI data.
- Modifications to the interlockings can be made to represent more closely the detailed signalling requirements leading to an accurate model of the interlockings.
- The model can demonstrate any timing issues which may arise from the decision to use SSI. It also provides a facility for examining different SSI boundary allocations.
- Whether a VDU representation or panel is proposed for the control system, TRESIM can be used to evaluate the workload on the signaller.
- Operation of the proposed timetable can be examined under normal or failure conditions to determine its resilience.

Timetable Verification

- At any stage in the evolution of the proposed signalling system, TRESIM can be used to check that the timetable is valid and can be delivered by the system.
- Logged information can be interrogated to examine any deviations from the timetable. The effects of train delays and/or system failures can then be injected into the system and the effects on train running can be explored. The optional provision of TRETTS (TRE Timetable Simplifier) offers enhanced views of the timetable and provides productivity savings to support this process.



TRELEA – Train Velocity / Time Graph

Measures

The benefits are derived from a number of measures which can be categorised as either Capacity measures or Maintenance measures:

Capacity Measures

TRELEA measures and logs the following parameters using a TRESIM simulation of a given layout, including:

- Headway measurements for all signals.
- Junction margins.
- Platform re-occupation time.
- Control system demands.
- Early or late running.
- The number of trains facing red signals.
- The number of trains approaching different aspects.
- Speed profile graphs.
- Train graph output.

- Platform occupation graphs.
- Train delay reports.
- Ratio between theoretical and timetable headways.

Maintenance measures

TRELEA measures and logs the following parameters using a TRESIM simulation of a given layout including:

- The number of times each set of points is called.
- The number of times each track circuit is occupied.
- Signal lamp failure prediction based on the number of aspect changes and the length of time the lamp is lit.
- The amount of time for which the point detection on any set of points is required to hold signals at proceed aspects.