

## Validating Stimuli And Responses In Safety-Critical Railway Systems

PROJECT PROFILE: INVENSYS – WESTINGHOUSE RAIL SYSTEMS

### The Challenge

Westinghouse was using a complex simulation as part of the testing of safety-critical railway systems, so needed a way of validating the outputs of the simulation at the same time as collecting test data.

### The Solution

Hawkgrove developed a system which monitors and records real-time activity at system interfaces on train-borne equipment and throughout the railway network. It translates signals into human readable form and overlays data from the simulation and live systems, so that project staff can quickly spot any issues.

### Results

Because Westinghouse can prove that the simulation is providing all the right stimuli at the right time, the company has eliminated large elements of risk from the project, without the time and cost of validating the simulation itself.

### Next Steps

Since delivering this project, Hawkgrove has extended the concept into a commercial product, SyDat, which provides a complete set of interface development and management tools.

For more information please contact Hawkgrove or visit the product web site at [www.sydat.com](http://www.sydat.com).

### Details

Westinghouse is playing a major part in updating the London Underground Victoria Line.

Because the project involves numerous sophisticated, safety-critical systems, Westinghouse is carrying-out extensive verification and validation, including simulation of hazardous situations.

It was recognised early-on that a great deal of uncertainty and project risk could be eliminated by monitoring and validating the actual signals that were to be passed between the different systems and the simulations.

To provide this capability, Westinghouse asked Hawkgrove to design and deliver a system that would give their test team instant visibility of the signals that were being passed between systems, including translation of data into human readable form (e.g. 0 = 'door open').

Signals from train-borne and trackside systems are monitored through a series of interface devices, which timestamp data before passing it over a wired or wireless connection to the central controller, which runs on a regular laptop.

The system translates the signals into plain language using the project's data definition documents. These are imported using XML and can be modified if necessary as the project progresses.

The signals are viewed side-by-side in near-real-time through a flexible and intuitive user-interface. The system provides instant replay facilities, as well as exporting the recorded data for subsequent analysis and documentation.

