

Demonstrating The Safe Running Of A New Railway Control System

PROJECT PROFILE: INVENSYS - WESTINGHOUSE RAIL SYSTEMS

The Challenge

Proof of concept trials for a new Moving Block railway control system required demonstrations including scenarios that would have been potentially hazardous to run on the actual rail network and difficult to create on short test tracks.

The Solution

Hawkgrove adapted and extended an existing Westinghouse test facility to provide a solution that interfaced to the real railway network to mimic the operation of a metro train, running jointly with a real train, under the control of the proposed new system.

Results

As a result of these trials Westinghouse was able to prove the principles of the Moving Block System without the need to fully develop and test a complete solution.

Details

Hawkgrove adapted and extended a generic railway simulation, which had been developed by Westinghouse Rail Systems, in order to deliver an accurate simulation of the test track – part of the Madrid metro network.

A key part of this work was the development of new interfaces that enabled the simulation to interact with real railway networks. These interfaces included physical links to all the track-side sensors and connection to central control systems through a standard MCU (Mobile Control Unit) radio.

Extensions to the system included a detailed simulation of a Madrid Metro train, incorporating accurate models of all the onboard control and supervisory systems, with representative modelling of acceleration, braking and other driving characteristics.

The custom simulation and its interfaces to the live network enabled Westinghouse and Dimetronic to conduct fundamental safety demonstrations that would have been otherwise impossible:

In the initial phase it simulated a complete and fully functional railway network around a short stretch of test track, allowing comprehensive demonstrations in a safe, isolated environment, of trains running under the control of the proposed systems.

In the second and final phase, testing was conducted during engineering hours on the real railway network. The same simulation solution underpinned comprehensive demonstrations of multiple trains – real and simulated – running at speed and in complete safety, under the control of the proposed new systems.



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