

Engineering Acceptance

This case study looks at the ability of VAMPIRE® Pro to help with the cost effective acceptance of railway vehicles into service. This example relates to the introduction of highly complex on-track plant to the UK.

Matisa P95

Traditionally, new on-track plant from mainland Europe is transported to the UK by road. It is then subjected to a series of acceptance tests before being approved for operation on UK infrastructure. However, the sheer size and complexity of the Matisa P95 Track Renewal Train would have required it to be substantially dismantled in order to transport it in this way:



Instead, DeltaRail worked with Matisa and Interfleet Technology to develop a new approach whereby dynamic simulation was used as a key part of the acceptance process. This enabled the vehicle to be hauled through the channel tunnel and directly on to Network Rail infrastructure.

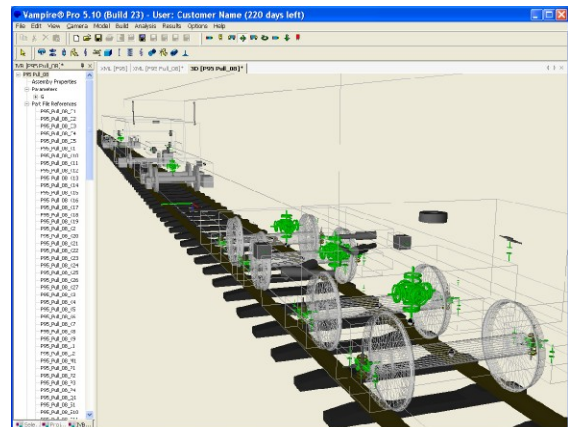
The Acceptance Process

The following process was employed to demonstrate that the P95 track renewal train would meet UK vehicle acceptance requirements:

- static tests (torsion and bogie rotation) were undertaken in Switzerland
- an instrumented ride test was then undertaken on Swiss track
- a VAMPIRE® vehicle model was constructed and validated against both the results of the static tests and the ride test (using the track data for the Swiss test route)
- the validated VAMPIRE® model was then instrumented with “virtual transducers” and its performance evaluated on UK track geometry

- VAMPIRE® was also used to undertake a slow speed Y/Q evaluation, as required by UK Railway Group Standards for vehicle designs of this complexity

The simulations also proved useful in terms of refining the vehicle’s design to ensure that it would meet the requirements of UK Group Standards.



The vehicle was subsequently accepted for UK operation on the basis of the static tests, the “virtual ride test” and the slow speed Y/Q analysis. This enabled it to be hauled directly through the Channel Tunnel to begin operation on UK infrastructure.

Conclusion

Dynamic simulation is a useful tool to facilitate the introduction of new rolling stock or complex on-track plant. It is possible to undertake a great deal of the evaluation required to certificate new vehicles in a virtual environment.

This can have significant benefits in terms of the time and cost required to gain approval. It also has the added advantage that, should problems be identified either prior to or after introduction to service, simulations can be used to identify the problem and develop an effective solution.

Further Information

For further information please contact the VAMPIRE® Helpdesk:

email: vampireadmin@deltarail.com

web: www.vampire-dynamics.com

