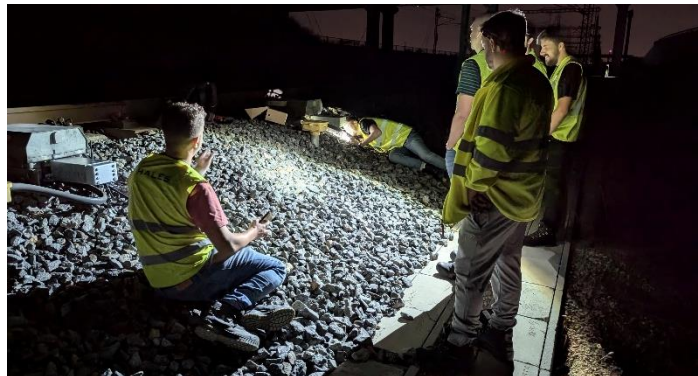




Hitachi Rail GTS Spain demonstrator in two locations in Spain within FP3-IAM4RAIL WP3.

CLUSTER B



Within the scope of Work Package 3 (WP3) “Wayside Monitoring and TMS link: Design and Deployment” under ERJU Flagship Project 3 (FP3) IAM4RAIL programme, Hitachi Rail GTS Spain has participated in the implementation of Use Case 2, which aims to collect data from different assets and resources to achieve predictive maintenance for critical assets, as point machines, enabling informed decision-making related to traffic management activities.

This use case involves collaboration between different companies: Hitachi Rail GTS Spain, ADIF (leader), Indra and Enyse, composing an integrated demonstrator installed across the Spanish railway network.

Hitachi Rail GTS Spain has been focused on switches and crossings as they are sensitive components of the railway infrastructure. Currently, in the Spanish network, there are more than 15,000 switches and crossings so their correct maintenance is essential, given the high number and importance in safety.

Given the critical importance of maintenance, it is essential to adopt innovative technological solutions that facilitate a predictive maintenance strategy for switches and crossings, among other systems, allowing for the early detection of structural damage. Implementing predictive maintenance would yield several advantages, including:

- Improved maintenance planning
- Reduced downtime
- Optimised maintenance costs
- Extended asset lifespan
- Enhanced utilisation of work intervals

Hitachi Rail GTS Spain has deployed its demonstrator in two different locations, where the two field elements are being monitored and analysed. All the information gathered will be integrated into an Intelligent Asset Management System (IAMS), which will also allow additional different assets into a common data base and Human Machine Interface (HMI).



The elements and locations have been thoughtfully selected due to their importance in the railway infrastructure. Hitachi Rail GTS Spain has deployed the demonstrator in two locations:

- GTS' point machine monitoring sensors in Bifurcación Torrejón de Velasco (Madrid-Seville high speed line):

Point machines are of enormous importance in the railway infrastructure, so detecting as early as possible any anomaly that could lead to a breakdown resulting in delays or disruptions to rail traffic is an important objective.

To achieve this, Hitachi Rail GTS Spain has placed two new types of non-invasive sensors on a regularly moving point machine that trains pass through frequently to collect vibration and pole separation information from it and send it to the Intelligent Asset Management System for further analysis.



Final result of the installation on the point machine

- GTS' point machine Smart Wayside Object Controller (SWOC) in Medina del Campo-Olmedo line (former high-speed railway line currently out of operation):

The second location comprises the installation of a Smart Wayside Object Controller (SWOC), developed during the past European Shift2Rail Joint Undertaking, to move a point on an out-of-service section and collect data that will be used to make maintenance decisions on the electro-hydraulic motors that move the point.

By analysing this data, it will be possible to improve the maintenance of specific machines.



Rack in its final installation during its grounding

In summary, Hitachi Rail GTS Spain has implemented a demonstrator that uses sensors and SWOCs to design and implement an unmanned and unsupervised data acquisition system. This will enable unmanned, self-diagnostic asset assessments for condition monitoring of track solutions. Furthermore, using sensor data, together with information from the SWOC, the IAMS will analyse and process this information to assess the condition of the elements. This will allow the extraction of relevant information that can provide the maintenance team with a clearer understanding of the condition of the assets, resulting in better and more efficient maintenance.



Founding Members



“Funded by the European Union. Views and opinion expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or Europe’s Rail Joint Undertaking. Neither the European Union nor the granting authority can be held responsible for them. This project has received funding from the European Union’s Horizon Europe research and innovation programme under Grant Agreement No. 101101966.”



The project is supported by the Europe’s Rail Joint Undertaking and its members.