

MonitoRail is a two year project sponsored by the European Commission under the Seventh Framework (FP7) - Research for the benefit of the SMEs.



The objective of MonitoRail is to develop a cost-effective long-range ultrasonic inspection method as well as a wireless condition monitoring system in order to improve and maintain the European railway system for better efficiency and safety.

The project will reduce the substantial costs related to rail inspection and contribute to achieve the target set by the European rail industry to reduce the overall maintenance expenditure by 30% by 2020. A 10% increase in the availability of the network due to better reliability and a reduced requirement for maintenance will also be achieved.

PROJECT GOALS

- ▶ To inspect critical areas where the probability for defects is high and there is limited access to carry out the conventional NDT techniques.
- ▶ To inspect long lengths of rail track from a single location.
- ▶ To develop a cost efficient technique for continuous monitoring.
- ▶ To achieve 100% coverage of the rail cross section (head, web and foot).
- ▶ To extend the life of the rail through early repairs of rail tracks.
- ▶ To reduce the number of broken rails caused by undetected defects.

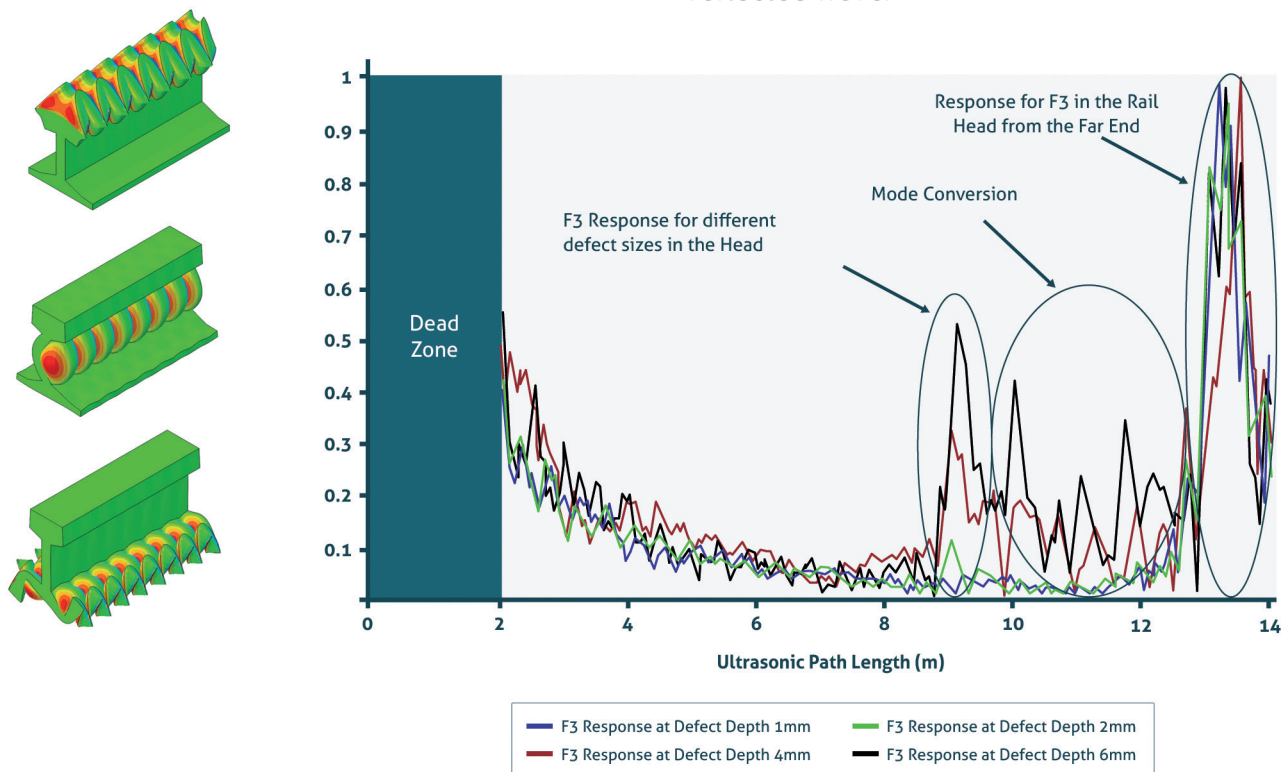
TECHNICAL OBJECTIVES

- ▶ The project will develop a guided wave LRUT system for real time monitoring of the rail to create an intelligent railway infrastructure.
- ▶ Novel permanent sensors will be attached to the track.
- ▶ Energy harvesting will be investigated to power the sensors.
- ▶ Central software program for structural health monitoring will be developed.
- ▶ Wireless method will be investigated for transmission of data from rail to a central base station.

Guided waves

The rail is a natural wave guide where waves can easily propagate for long distances and detect defects in different areas such as the head, the web and the foot. The inspection of engineering structures using guided waves is attractive because it is possible to investigate complete material volumes in regions over 100m away from the point of measurement.

Guided wave ultrasonic inspection is different from conventional ultrasonic inspection, as an array of transducers fitted round the outside of the part being inspected sends a sound wave along the length of the component, rather than through it. The component itself constrains the waves along the pipe wall. The received signal depends on the nature of the reflecting surface. Therefore, discontinuities such as corrosion or metal loss can be detected analysing the reflected wave.



Project consortium

TWI Limited, Vermon SA, Open Pattern, Aerosoft S.p.A, Jackweld Limited, Network Rail, Kentro Erevnas Technologias Kai Anaptyxix Thessalias (Cereteth), Brunel Innovation Centre.

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