

RIFLEX

Rail inspection by flexible acoustic transducer

Background

As the number of European rail passenger journeys increase, the demand on the availability of supporting assets increases. Infrastructure maintenance is underpinned by various non-destructive evaluation mechanisms and the increase in demand subsequently increases the need for efficient and effective routine inspection. The majority of inspection is currently delivered manually through either ultrasound or eddy current techniques, which are time consuming. Where inspection is undertaken by mobile automated ultrasound there are challenges due to loss of coupling and wear of the coupling mechanism. Therefore, there are opportunities to improve the speed and effectiveness of rail inspection by meeting the inspection challenges.

Objectives

The aim of RIFLEX is to deliver an integrated solution that overcomes these challenges through the development of a more rapid and reliable automated inspection system for rails. Arrays of flexible electromagnetic acoustic transducers (EMAT) devices are proposed to dry couple to the rail to overcome the limitations of wet coupled probes. The project supports automated inspection to overcome the limitations of manual inspection while maintaining or improving on the existing levels of reliability.

Benefits

The project will deliver an inspection solution that offers a significant increase in the speed of travel during inspection through:

- demonstrating the fundamental capability of EMATS devices to perform effective inspection of rail steels
- demonstrating the application of field programmable gate array (FPGA) components to enable rapid signal processing of measured signals
- developing an optically driven actuator assembly that is able to independently control the transducer elements and thus maintain the proximity of the transducer to the rail head
- demonstrating the functionality of an integrated software driven NDT system.



Project partners

TWI Ltd
 NDT Consultants Ltd
 Dynamics, Structures and Systems International
 AIRTREN S.L
 iKnowHow Informatics S.A
 I-MOSS NV
 University of Birmingham
 Rail Alliance Ltd