Attachment to SAFERAIL Project Final Report

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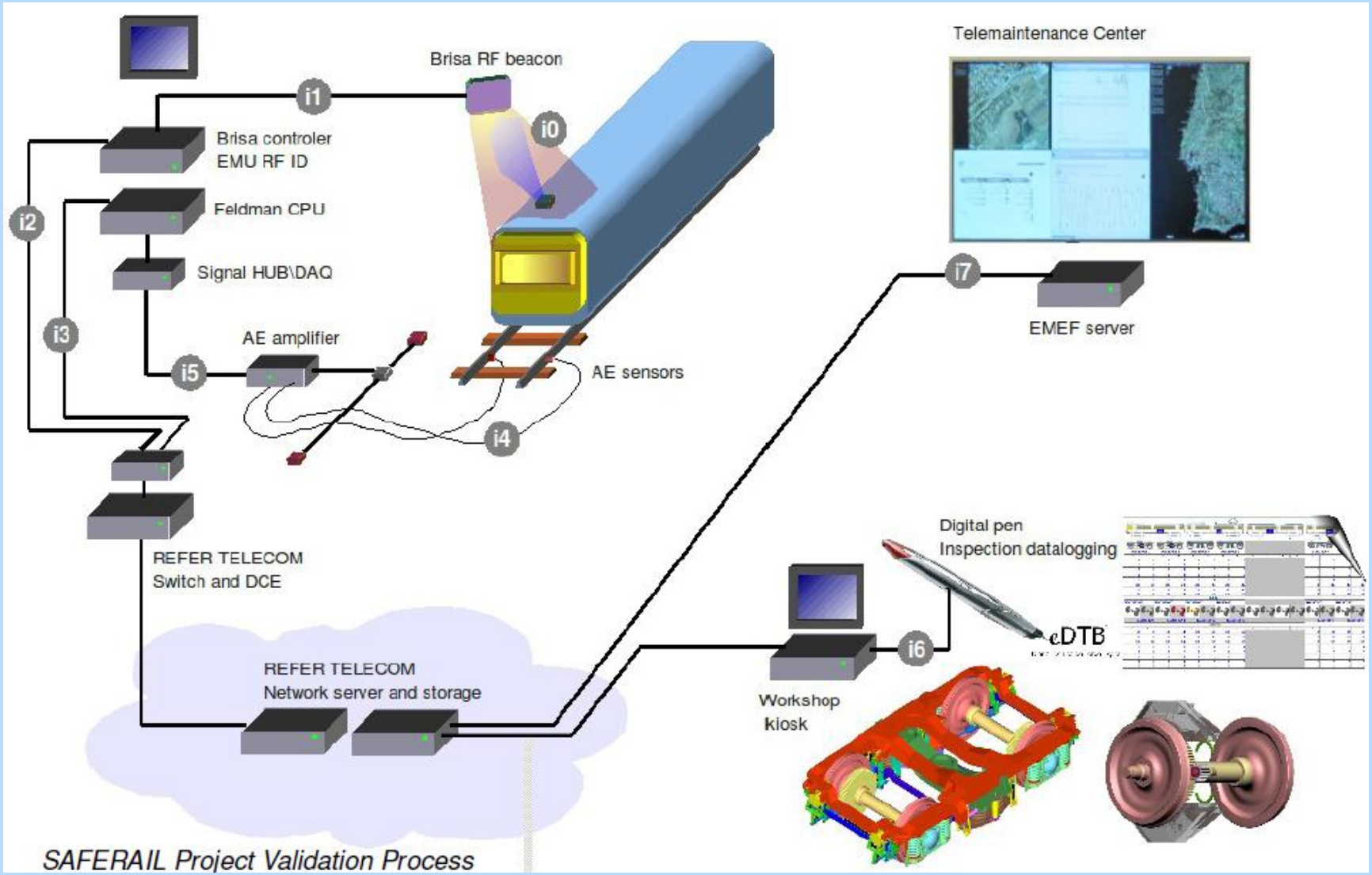
SAFERAIL


SAFERAIL
Development of Novel Inspection Systems for Railway Wheel sets
Delivering a step change in railway rolling stock reliability

Wayside Monitoring - Overview



Wayside Monitoring
- Acoustic Emission Monitoring

Development of a wayside continuous monitoring system prototype for inspection of passing rail stock

Technique: Acoustic Emission (AE)

Developed Features:

o Continuous Monitoring for wheel “flats” and cracks

o Data conveyed to online database

o Automatic detection of wheel set faults using novel detection algorithms

Wayside Monitoring – High Frequency Vibration Monitoring

Development of a wayside continuous monitoring system prototype for inspection of passing rail stock (light and heavy rail)

Technique: High Frequency Vibration Monitoring via Accelerometers mounted on rail

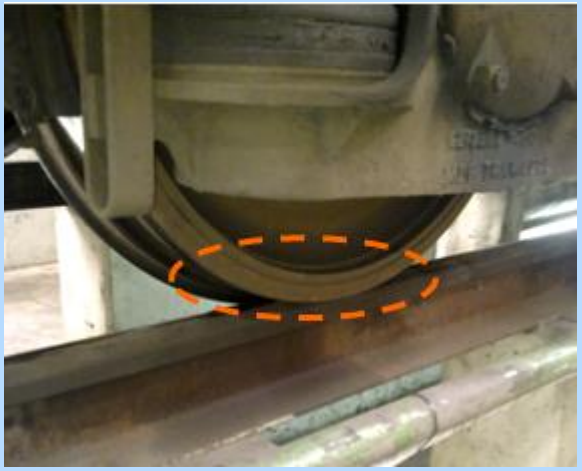
Developed Features:

o Detection of Wheel flats, Oval wheel, Broken wheel gummy

o Real time alert for bad wheel

o Collected data measurements can be checked using a web page

Wayside Monitoring – Hot spot detection using thermography



Developed Features:

o Infrared array

o LabView controlled DAS and events and alarm database

o Low hardware cost

Development of a wayside continuous monitoring system prototype for inspection of hotspots on wheel rim and axle bearing box

Technique: Thermography inspection via trackside infrared detector arrays

Manual Inspection
- Phased Array Ultrasonic Testing

Developed Features:

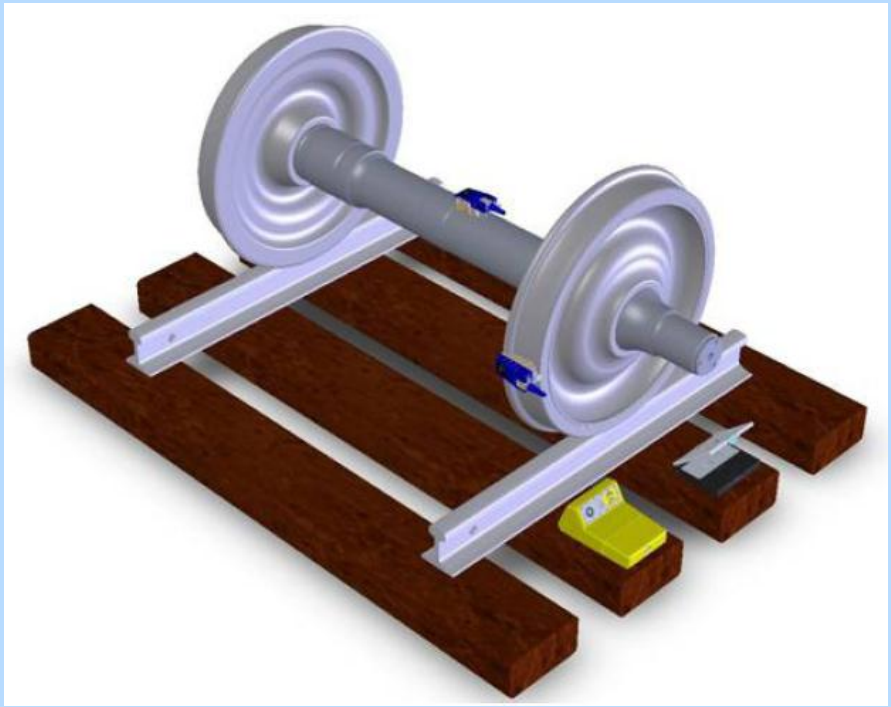
o Reduced workshop axle disassembly by inspection of axles from their end shaft and face area

o Detection of surface and sub surface cracking

Development of a manual inspection system for wheel sets

Technique: Phased Array Ultrasonic Testing (PAUT)

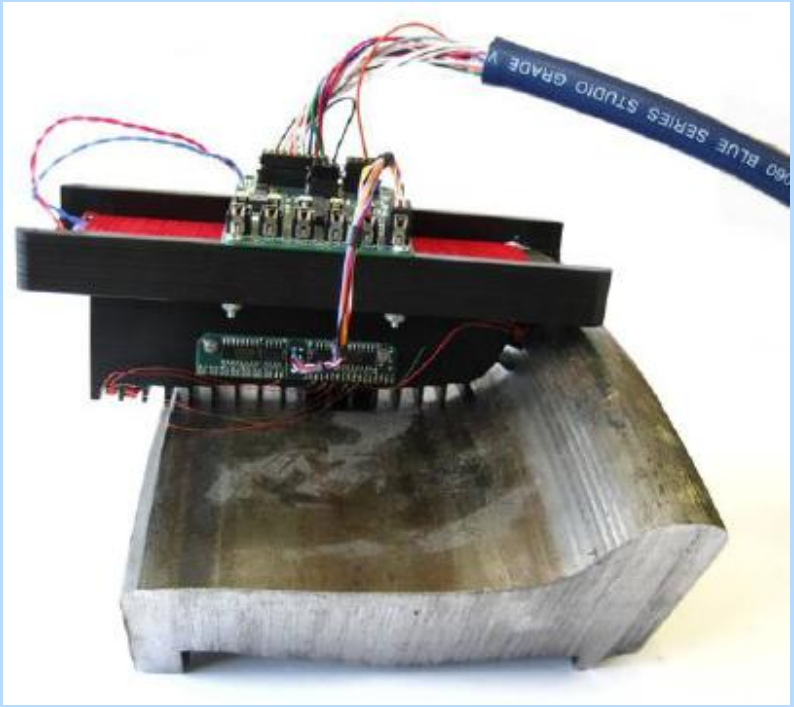
Manual Inspection
- Alternating Current Field Measurement



Developed Features:

o Detection of Small surface breaking cracks

oThe sensors can work through dirt, grease and paint



Development of inspection prototype for manual inspection of wheel sets using Alternating Current Field Measurement (ACFM) technique

Partners

SAFERAIL

APT

Envirocoustics
Non Destructive Testing

VTG

DE LIJN

EMEF

SNCF

TWI

UNIVERSITY OF BIRMINGHAM

iSQ

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The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 218674.

Acoustic Emission Module Demonstration

On the afternoon of Tuesday 3 May 2011 EMEF hosted the Acoustic Emission (AE) online inspection module demonstration.

Visitors to the demonstration day included representatives from MOPTC, Alstom, Siemens, Bombardier, Brisa, DailyWork, REFER, REFER Telecom, APNCF, ISEL, RAVE, METRO and EMEF.

Site visits took place at two EMEF sites: First at Belem train station and second at Train Cais do Sodre Oerias Workshop. At Belem the AE trackside inspection system was demonstrated to the consortium. In addition, some of the EMEF invited guests who attended the meeting in the morning were also present. Mr António Mendonça, the (now former) minister for the Ministry of Public Works, Transport and Communications (Portugal) also visited and received a demonstration of the AE inspection system (see Figure 4).

Demonstration of the AE System to Mr António Mendonça, the (now former) Minister for Public Works, Transport and Communications (Portugal)

Mr António Mendonça on the day of the demonstration being interviewed by a news team