RWI - Rail Wheel Inspection

Ultrasonic wheel inspection system for high performance rail vehicles

The wheels of high performance rail vehicles should be certified as safe and reliable. Because of the high testing speeds required (approximately 750 mm/sec) and the high production rate (one wheel per minute), it was agreed that a new system, incorporating high speed 16-channel pulser and dual immersion tanks, be developed and manufactured.

The system included, as well as the two tanks, two special handling fixtures, complex control electronics and all documentation required for operation and maintenance, along with the associated software.

**Technical details**

**Inspection areas:**
- Rim from surface (4 UT probes)
- Rim from inner side (2 UT probes)
- Rim from inner side (2 UT shear probes)
- Hub from one side (2 UT probes)
- Disc from one side (2 UT probes)
- Flange with shear wave (1 UT probe)

**Inspection speed:**
- 750 mm/s

**Electronic:**
- IZFP PCUS11-card
- Remote fault diagnosis via internet for UT-PC and PLC
- Driving motors for hub and disc out of water

**Advantages**
- Automatic testing sequence using two immersion tanks
- One minute test cycle per wheel (without disc inspection)
- Disc inspection of every tenth wheel
- No mechanical disassembly required for various wheel diameters
- Detection sensitivity per DSR 1 (disk shaped reflector of 1 mm diameter)
- Minimal dead zone (below the test surface - 10,0 mm)
- Inspection areas: wheel flange, wheel rim, disc, hub and stamp recognition
- Automatic data analysis using RF data input
- Online monitor with 4 A-scan image capability
- Remote diagnostic capability for UT controller electronics via internet

**Engineer standards**

The complete rail wheel inspection system had to be designed, manufactured and delivered in accordance with the following standards:
- RD 32.144-2000
- EN 13 262
- UIC 812-3V
- AAR M 107-84
- ISO 5948
- DB-TL 918 272
- AFNOR 09-340
- AFNOR ND-FOIL-142