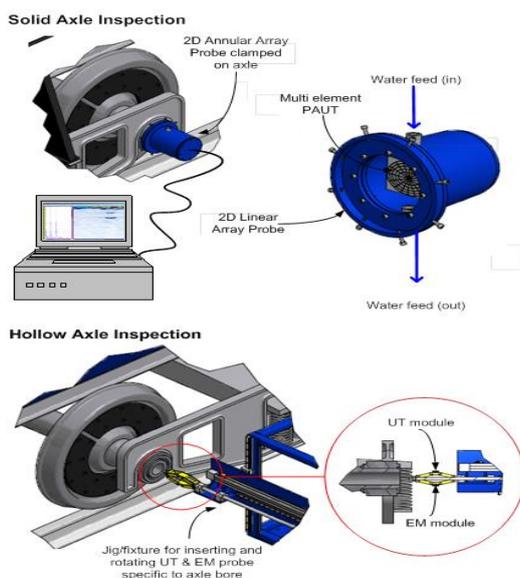


AxleInspect - Development of novel inspection techniques for train axles

The structural integrity of wheel sets used in rolling stock is of great importance to the rail industry and its customers. In the last 15 years, 33 deaths and 48 injuries have occurred in Europe alone due to failure of train axles, not to mention the financial aspect of some reported derailments, which fortunately did not result in deaths or injuries but burdened the train operators with huge expense and disruption to their services. This has led to increased demands for the inspection and maintenance of axles.

Currently the rail industry has a number of methods available to inspect solid axles. However, all these methods suffer from the problem that full access to the axle is required in order to perform a full inspection.



AxleInspect project concept

Project objective

The AxleInspect project aims to develop new inspection technology based on phased array ultrasonic testing (PAUT) and electro-magnetic (EM) techniques suitable for the inspection of both solid and hollow axles. The key difference between the developments of this technology compared to other existing manual inspection techniques is that inspection can be conducted in-situ without the need to remove the axles and associated bogies from the train (and with minimal disassembly of the wheel set).

For solid axles, inspection techniques are to be developed such that inspection is carried out from the end face of the axles using novel 2D annular PAUT technology, to be developed by the consortium. For hollow axles, probes based on conventional ultrasonic testing (UT) and EM inspection techniques are to be developed. The EM techniques will be used to detect surface breaking cracks that cannot be detected by UT inspection. Data fusion will combine UT and EM results to give 100% coverage.

The overall idea of the project is to improve the efficiency in the use of axles by extending their life and monitoring their safe deployment. The research organisations will provide research and development capability to the SMEs for the following:

- New 2D phased array probe; a one size fits all probe capable of inspecting solid axle types with different end face patterns
- Combined UT and EM inspection system capable of inspecting different diameter bore hollow axles
- UT and EM data fusion software for information integration of the two NDT technologies
- Inspection scanners for probe positioning for hollow and solid axle inspections

For further information, please visit the project website at www.axleinspect.eu.

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