X-scan - Laser Guided inspection robot for the non-destructive testing of thin steel gauge welds in the shipping industry

X-scan aims to develop and produce novel solutions for the shipping industry. Ocean going ships are the most cost-effective form of transporting bulk goods around the world. To date, Europe owns nearly 40% of the world's fleet of ships. Moreover, in the supply of ship building components and services, the EU is a world leader. As a result, the maritime industry, which includes ship building and ship operation, are vital to Europe's economy.

In this industry sector, structural failure is a major cause of the loss of ships, vessels and tankers resulting in loss of life and pollution of the world's oceans, seas and coastal waters of Europe. Indeed, it has been reported in 2006 that each year over 400 ocean-going ships sink, many as a result of weakened structures due to corrosion and inadequate/poor welding quality.

Most of the inspection techniques used to date proved to be disruptive to the manufacturing process and are far from being cost effective. Additionally, as the current generation of ships are being built from thinner section steels (10mm or less) to lower the cost of build and ship operation, typical assessment methods are not as effective as for thicker sections.

Project objective

The X-scan project aims to respond to this need by developing novel automated NDT techniques (ultrasonic and electromagnetic) for ship structures that are more reliable, faster, cost-effective and safer than the currently applied radiographic inspection techniques. The objective of the project is twofold: firstly, the project will concentrate on solving the problem of inspecting thin steel welds using phased array ultrasonic testing (PAUT) and alternating current field measurement (ACFM) techniques; and then it will tackle the automated inspection of inaccessible welds by means of a laser guided manipulator.

The X-scan device will provide a quick and efficient means of detecting significant defects in the welded joints. The X-scan project will bring the following benefits to the inspection of ships:

- Elimination of dangerous radiography
- Elimination for the requirement to work at height
- Reduced set up time and cost

The solution is to combine electromagnetic and advanced ultrasonic techniques to fully inspect thin welded plates and to integrate those with existing technologies, giving one complete inspection unit. The new ultrasonic system will provide defect imaging and analysis at much greater convenience and speed than currently exists.

For further information, please visit the project website at **www.x-scan.eu**.

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