

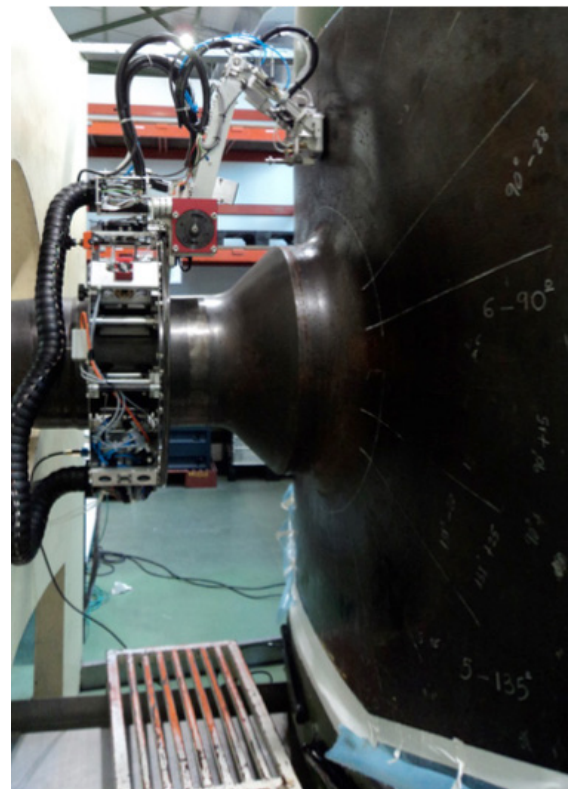
Autonomous Robot for Automated Inspection of Nozzle Welds / NOZZLEINSPECT

the objective of the project

Development of an automated robotic scanning system that will improve the reliability and speed of the inspection of the welded nozzle sections in nuclear and other safety critical facilities. The system with a new and novel flexible phased array probe can perform a complete inspection of the nozzle weld, using an advanced navigation system to follow the complex weld profile.



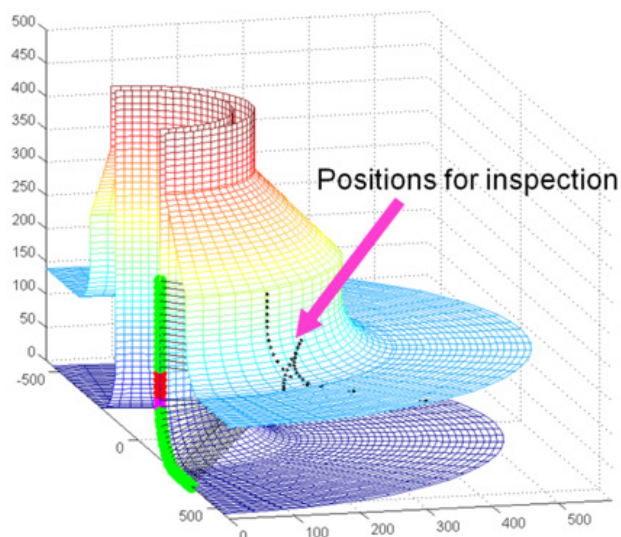
View of the nozzle



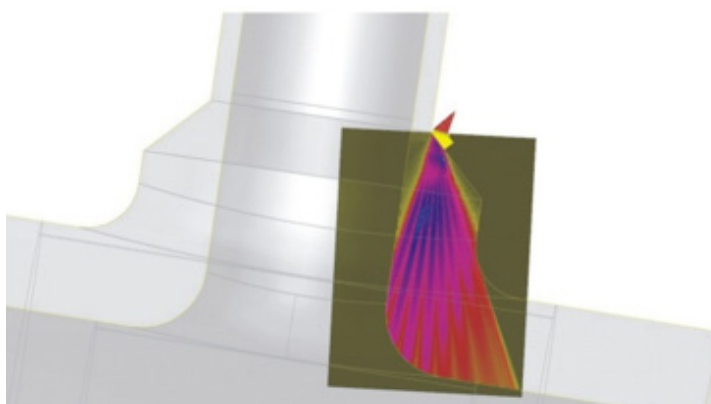
The robotic scanner on the nozzle mockup

ultrasound institute

Developed the models for performance analysis of the ultrasonic phased array even in the case of complex 3D geometry of the nozzle. By application of the models the scanning path, parameters of phased array and the wedge that enables the required coverage, including the areas of the nozzle critical for inspection have been determined.



Side view of the inner surface of the nozzle to be inspected and the possible positions of the ultrasonic probes



The simulated image of the ultrasonic field of 2 MHz 32 element phased array for inspection of inner radius of nozzle (sectorial scanning from 35° to 70°)

project partners

TWI (UK), Nexus (Bulgaria), Vermon (France), Peak NDT (UK), Iberdola (Spain), HES (Bulgaria), Kaunas University of Technology (Lithuania), Zenon (Greece).

related publications

1. E. Jasiūnienė, L. Mažeika, O. Tumšys. Investigation of ultrasonic inspection of the inner radius of a nozzle // Insight. Northampton : British Institute of Non-Destructive Testing. ISSN 1354-2575. 2013, vol. 55, no. 4, p. 182-186.
2. E. Jasiūnienė, L. Mažeika, O. Tumšys. Investigations of the inspection possibilities of the inner surface of the nozzle using ultrasonic phased array. Ultragarsas. 2010. Vol. 65. No. 3. P. 28-34.