

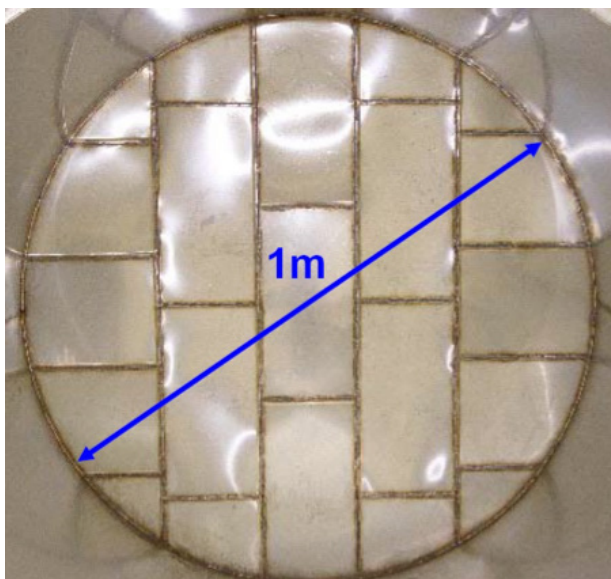
# Condition monitoring of large oil and chemical storage tanks using ultrasonic guided wave tomography without the need to empty and clean the tank / TANK INSPECT

## the objective of the project

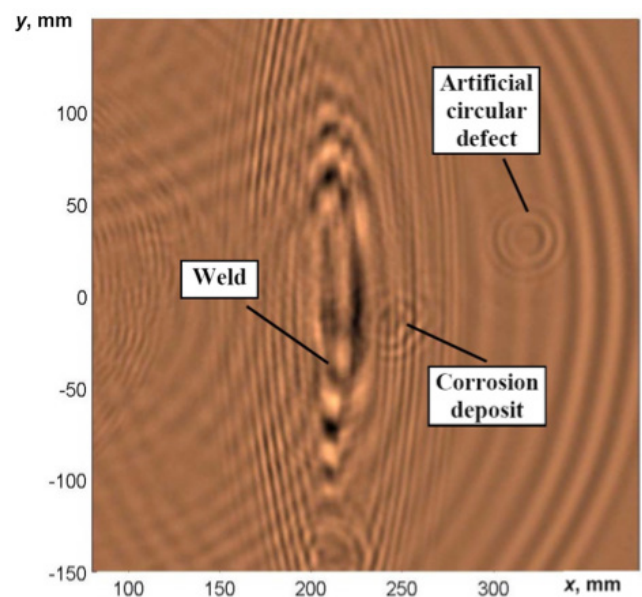
Development of a technique for inspection of a tank floor from outside of the tank do not requiring emptying and cleaning the tank.

## ultrasound institute

developed a novel inspection technique based on application of ultrasonic guided waves and ultrasonic transmission tomography, which enables to assess the spatial distribution of the corrosion in a tank floor. This solution was achieved as a result of investigation of propagation regularities of ultrasonic Lamb waves in the plates of a tank floor carried out by modelling and experiments.



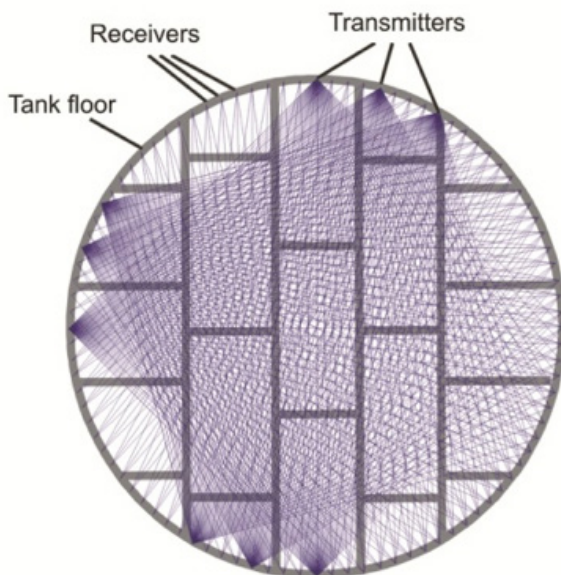
Top view of the scaled down physical model of the tank floor (welded lap joints) for laboratory investigations



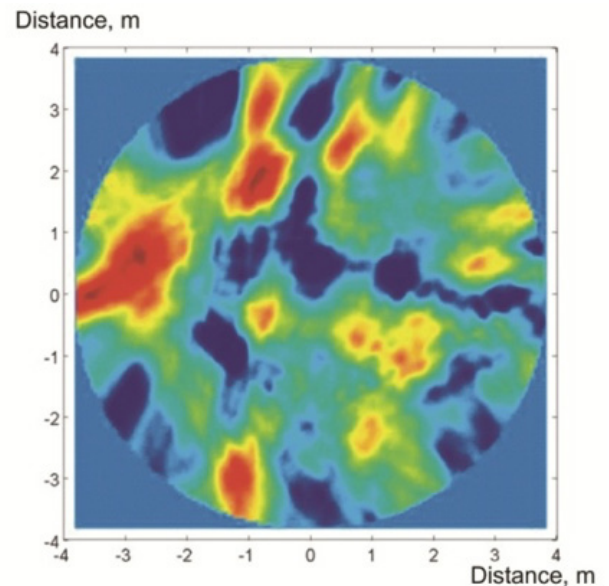
Ultrasonic field of waves propagating in the welded steel plates of the tank floor – high amplitude pattern corresponds to the weld, the circular patterns correspond to presence of artificial and natural defects



Experimental setup for the field tests of the tank with 8m diameter and partially filled with gasoline / diesel



Limited number of the transmitters and receivers used during experiments and their positions



The reconstructed relative distribution of the attenuation of the S0 mode of Lamb waves propagating in the tank floor. The red areas correspond to the zones with an essentially higher attenuation due to corrosion

## related publications

1. L. Mažeika, R. Kažys, R. Raišutis, R. Šliteris. Ultrasonic guided wave tomography for the inspection of the fuel tanks floor. International Journal of Materials and Product Technology. 2011. Vol. 41. No.1/2/3/4. p.128 – 139
2. R. Kažys, L. Mažeika, R. Barauskas, R. Raišutis, V. Cicėnas, A. Demčenko. 3D Analysis of interaction of Lamb waves with defects in loaded steel plates. Ultrasonics. 2006. Vol. 44. suppl. 1. p. e1127-e1130.