



Using Ultrasonic Guided Wave NDT to investigate the feasibility of remotely inspecting pressure retaining O-rings in bolted connections

James Pettit and James Strong

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Abstract

- ▶ Ultrasonic Guided Wave inspections can be deployed that offer the ability to rapidly inspect long lengths of difficult to access pipework in an accurate and non-intrusive manner.
- ▶ Guided Wave inspections are already used in the Oil and Gas industry to size and characterise the onset of corrosion in straight, large bore pipework.
- ▶ This study looked at their application in the aerospace industry to remotely inspect pressure retaining O-rings in bolted connections on hydraulic lines.
- ▶ Specific applications for this technology were investigated for assessing the condition and quality of fuel and hydraulic connections on aircraft platforms. The current inspection method relies upon lengthy visual testing and component disassembly, which increases aircraft maintenance periods and results in potentially unnecessary system disruption.
- ▶ This project set out to investigate (using a combination of Finite Element Modelling and empirical testing) whether the integrity and condition of seals could be assessed in a non-intrusive way using Ultrasonic Guided Wave technology.
- ▶ Ultimately this approach has the potential to reduce the duration of inspection programmes and offers increased availability of the aircraft without any compromise to safety.



Contact

- ▶ James Pettit (j.pettit@fnc.co.uk) specialises in the development, maintenance and implementation of engineering specific software codes for a range of customers within the power generation industry. Prior to joining Frazer-Nash, James completed an Engineering Doctorate, where his research focused on the deployment and modelling of ultrasonic Non-Destructive Testing.
- ▶ James Strong (j.strong@fnc.co.uk) has been working in mechanical integrity across the energy sector for over 15 years, predominantly in gas turbines, civil nuclear and oil and gas. James has a particular interest in Level 3 assessments and using simulation to provide insight when things have gone 'beyond code'.