

Asset Care Counts

January 2015

Tailored Phased Array Inspection for Mining Applications

Mine sites carry many critical components for which failure could represent a direct loss of production to the mine, with a direct impact to mine profitability.

The challenge is always on mine engineers and their chosen inspection partners to ensure that condition assessment of critical components is done efficiently and effectively.

One area where ALS has been improving outcomes for our clients has been in the inspection of critical shafts using tailored phased array ultrasonic testing (PAUT).

Tailored Phased Array (PAUT) – The benefits

Critical shafts come in a variety of geometries and with varying access requirements.

Bespoke inspection methods are often therefore needed to ensure that;

- All areas of the shaft where critical defects could occur are adequately inspected.
- The inspection method chosen minimises down time and associated costs.

Phased Array Ultrasonic testing coupled with custom designed scanning equipment can meet these primary needs through;

- **Significant flexibility** to manage unique shaft geometries.
- **In-situ inspection** to allow comprehensive coverage of critical regions without the cost of disassembly and extensive down-time.
- Relatively **high speed** (compared to other NDT techniques) of inspection, further minimising down time.
- **High probability of detection** of the most critical defects, particularly developing cracks.

These benefits can be realised through experienced phased array technicians, combined with custom mechanical scanners to allow maximum access to shaft surfaces from which inspection can be completed.

Proving the method works

Where ALS believes we set ourselves apart is in our rigorous proving of our bespoke PAUT solutions.

An uninspected region of the shaft in a critical area can lead to poor decisions as to how to manage the asset.

ALS conducts both laboratory and field trials of our techniques to ensure the method is proven and repeatable in the field.



Figure 1 – A Bucket Wheel Reclaimer, for which ALS provides inspection of Bucket Wheel Shafts, Boom Pivots and Crawler Beam Axles

An example – Inspection of bucket wheel shafts

A recent example comes from our inspection of bucket wheel shafts during a shutdown at a mine site.

This equipment had no standard inspection equipment which could provide satisfactory examination of the shaft condition whilst in-situ.

The client requirement was for inspection of critical areas, such as changes in shaft section, together with inspection for possible forging defects originating from shaft manufacture.

ALS developed and proved a specific PAUT procedure for this shaft, utilising phased array with both shear wave and longitudinal sound waves.

To effectively inspect the shaft, a purpose built scanning spindle was created and a raster scanning technique deployed.

The resultant inspection was able to provide full surface and volumetric coverage of the critical shafts without the need to remove them from the machine.

Defects of a critical nature are able to be detected, down to as little as 1mm deep by 10mm long in certain regions.

Our Advanced Inspection Team

ALS Industrial has PAUT staff in locations across Australia to support your needs for specialised component inspection.

These staff support our extensive group of Inspection technicians that allows ALS to effectively man even the largest site shutdowns.

For enquiries in regard to how PAUT / TOFD can be tailored to meet your inspection requirements.

assetcarecontactus@alsglobal.com

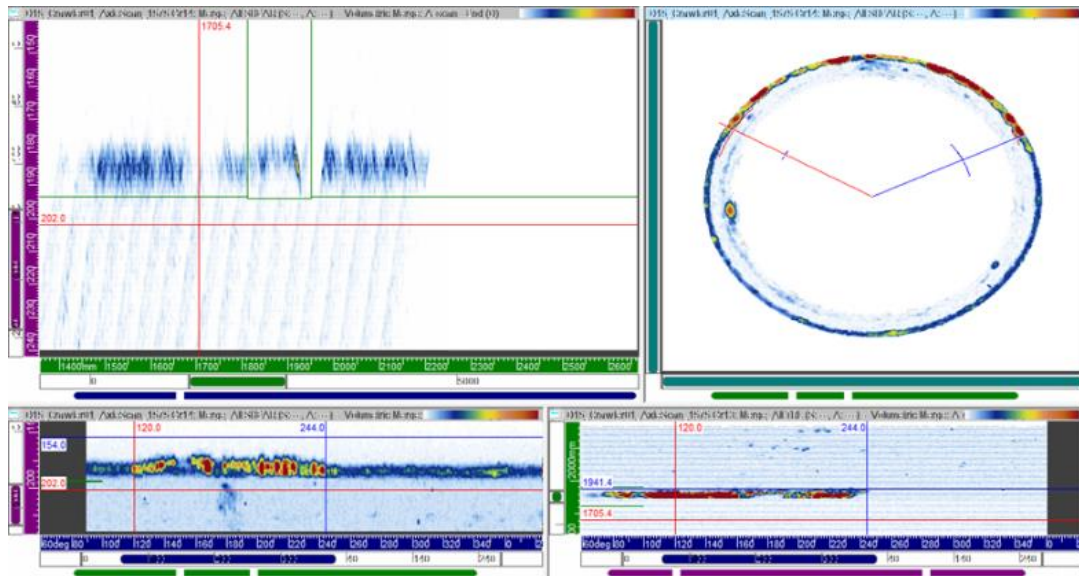


Figure 2 - Results of Bucket Wheel Shaft Inspection by Phased Array

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