

Phased array UT, UT-TOFD and the VEO³

The advanced Sonatest VEO³ phased-array and time-of-flight diffraction (PAUT and TOFD) ultrasonic testing instrument, available in South Africa from GammaTec, offers simplicity and detection reliability for all critical applications, most notably, NDT on nuclear infrastructure.

GammaTec has been a key provider of NDT equipment to South African industry since 1981. Since establishing a relationship with Necsa's NTP Group of Companies in 2009 for the global distribution of locally manufactured radioisotopes, however, the company has grown into a global NDT equipment provider.

GammaTec's head office remains in Vereeniging, South Africa, where it directly services its customers as well as its extensive distribution network, which covers Africa, the Middle East, Asia and Europe. "We are now able to provide a high profile 'ground floor' NDT presence across the world, with exports to over 70 countries worldwide," Ralph Davies, the company's MD tells *African Fusion*.

The International Atomic Energy Association (IAEA) promotes the use of NDT technology to maintain the stringent quality control standards for the safe operation of nuclear and other industrial installations. To meet the expected nuclear needs of Africa, the IAEA is currently funding an NDT centre of excellence for the nuclear industry at NECSA's Pelindaba nuclear research facility, with the SAIW leading the project. This project, which is specifically aimed at encouraging women into the profession, will focus on two advanced high-end NDT methods, phased-array ultrasonics (PAUT) and Ultrasonic Time of Flight Diffraction (UT-TOFD).

Sonatest's VEO³ PAUT and TOFD testing instrument

The new Sonatest VEO³ ultrasonic instrument that Gammatec distributes and supports allows inspectors to keep inspecting as they always have, with no need to change their current workflow. A key benefit of using advanced phased array UT

instruments such as the VEO³ is Total Focusing Method (TFM) technology, which, because of the vast amounts of data collected using the ultrasonic array probes, enables the user to synthetically focus in on every point of a region of interest.

This delivers excel-



Sonatest's VEO³, available in South Africa from GammaTec, can be used for phased array UT (PAUT) and Time of flight UT (UT-TOFD) using the live Total Focusing Method (TFM).

lent resolution and sizing performance, with the additional benefit of using an already approved, trusted and reliable UT procedure.

Unique to the VEO³ is the advanced Total Focusing Method Intermodal (TFMi™) mode, which Sonatest introduced with the VEO³. TFMi allows up to four propagation modes to be combined into a single acquisition window and provides a high-fidelity image of defects to aid in characterisation and sizing.

Specific features of the VEO³ also include:

- **Superior digital technology:** The VEO³ can deliver fast and accurate results using an impressive 32 channel phased-array beamformer that provides an exceptional signal to noise ratio due to enhanced digital signal processing. Thanks to its 64-bit Linux operating system and a fast 128 GB SSD memory capacity, huge amounts of information can be recorded for analysis in a single acquisition file.
- **Multi-scan/multi-technique capabilities:** With its advanced technology, the VEO³ is unique in allowing real-time multi-scan/multi-technique capabilities, making simultaneous TFM, TFMi, PA and TOFD views possible.
- **Intuitive menus and workflow:** Inte-

grated help and wizards guide the user through scan set up whilst optimisation tips ensure the VEO³ always performs at the highest level. Fast and efficient setup wizards for sound velocity; wedge delay; time, distance and amplitude correction; and encoder calibration are all provided as standard.

An inspection plan shows the operator in 3D where probes are positioned on the test part, simplifying the inspection set up and providing an inspection reference for reporting.

Using the latest computer technology, data can be permanently recorded for processing and report generation.

The VEO³ can freely run up to eight groups combining PA, TFM and TFMi groups in the same scan: with any combination of up to six TFM, one TFMi™ and eight PA groups. This creates a rich insightful layout of S-scan side views and the latest TFM imaging at the same time. Having both PA and TFM in the same scans saves time, where other systems may need to do these scans separately.

All the data received during scanning can be recorded on the instrument, enabling further detailed analysis to be performed later – whether on the instrument or on the inclusive UTStudio+ PC-based software application. Comparison with previous inspection data to identify trends and flaw/corrosion growth rates are also possible.

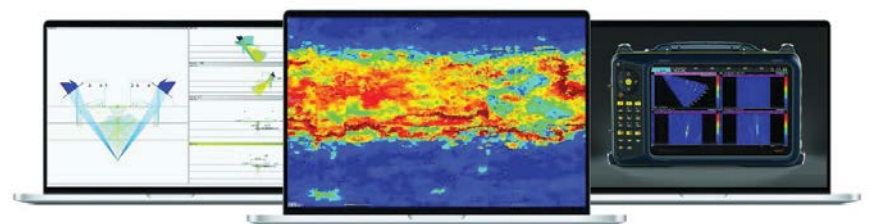
"The ability to reliably find and accurately characterise different types of defects is now really easy, making these advanced techniques more powerful than ever in the hands of competent NDT professionals," says GammaTec's Ralph Davies.

"The VEO³ is ideal for meeting the rigorous NDT requirements of the nuclear industry," he concludes.

www.gammatecsa.com



This QR Code links to a video of a VEO³ phased array scan of a centreline crack on a double V butt weld.



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