



**Structural Integrity Associates, Inc.<sup>®</sup>**

## Automated / Encoded Phased Array Ultrasonic Examinations

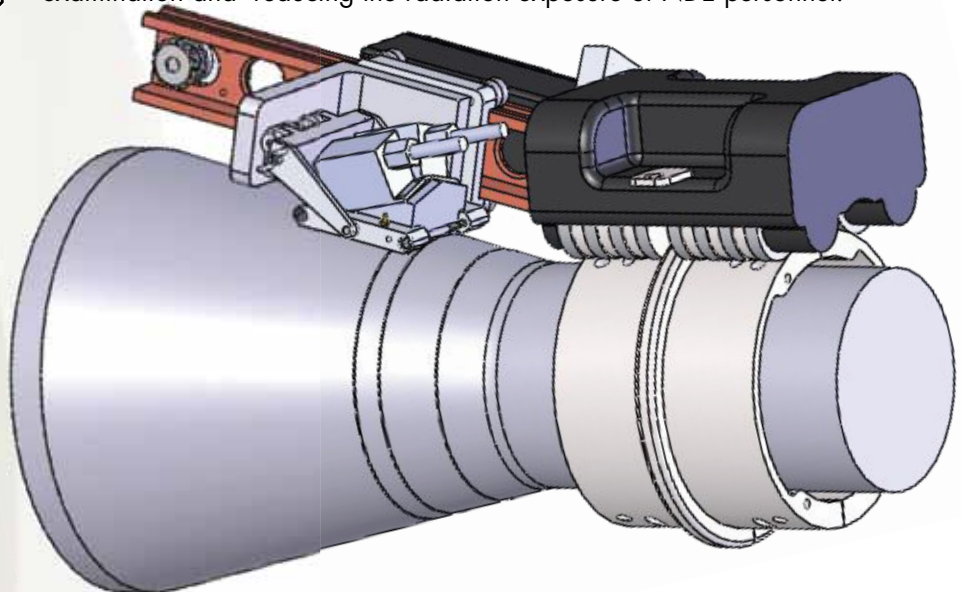
### INDUSTRY ISSUE

Based on recent industry operating experience, the use of manual ultrasonic examination and flaw evaluation techniques has come under increased scrutiny with questions being raised due to indications that were either missed or mischaracterized. The manual ultrasonic examination of dissimilar metal welds and weld overlay repairs has been increasingly questioned and the expectation is that use of automated / encoded techniques for examination and evaluation of safety critical items may soon be required.

Expectations are leaning towards the need for ultrasonic examinations of dissimilar metal welds that include the ability to record data for an independent third party review. This data would also be stored as a permanent record to allow for subsequent review. Additional expectations are for ultrasonic modeling of the sound path for verification that the focal laws are producing focused beams at the correct material depths for the detection of flaws. Additional regulatory attention is also being applied to fabrication flaws, which may not have been previously recorded or evaluated and could have a potential effect on adjacent inservice flaws.

### STRUCTURAL INTEGRITY ASSOCIATES' SOLUTION

The application of advanced linear phased array ultrasonics (LPA-UT) allows for a significantly enhanced evaluation of indications as compared to manual conventional ultrasonics. Add the automated or encoded recording of LPA-UT examination data, and detection and evaluation abilities greatly exceed those of manual conventional ultrasonic examinations performed during previous cycles. Automated / encoded ultrasonic data also allows for the enhanced evaluation of recorded indications that are suspect in through the use of computer based evaluation tools. With improvements in ultrasonic systems and processes, advanced encoded linear phased array UT is proving to be of great benefit by providing a reviewable permanent record of the examination and reducing the radiation exposure of NDE personnel.



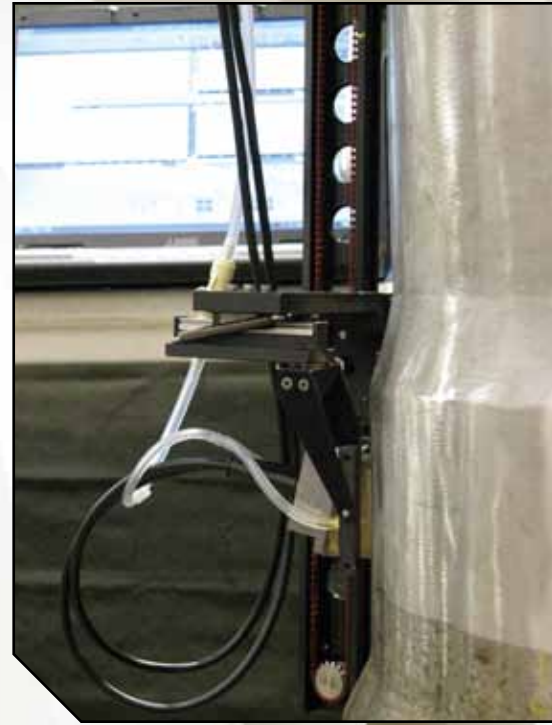
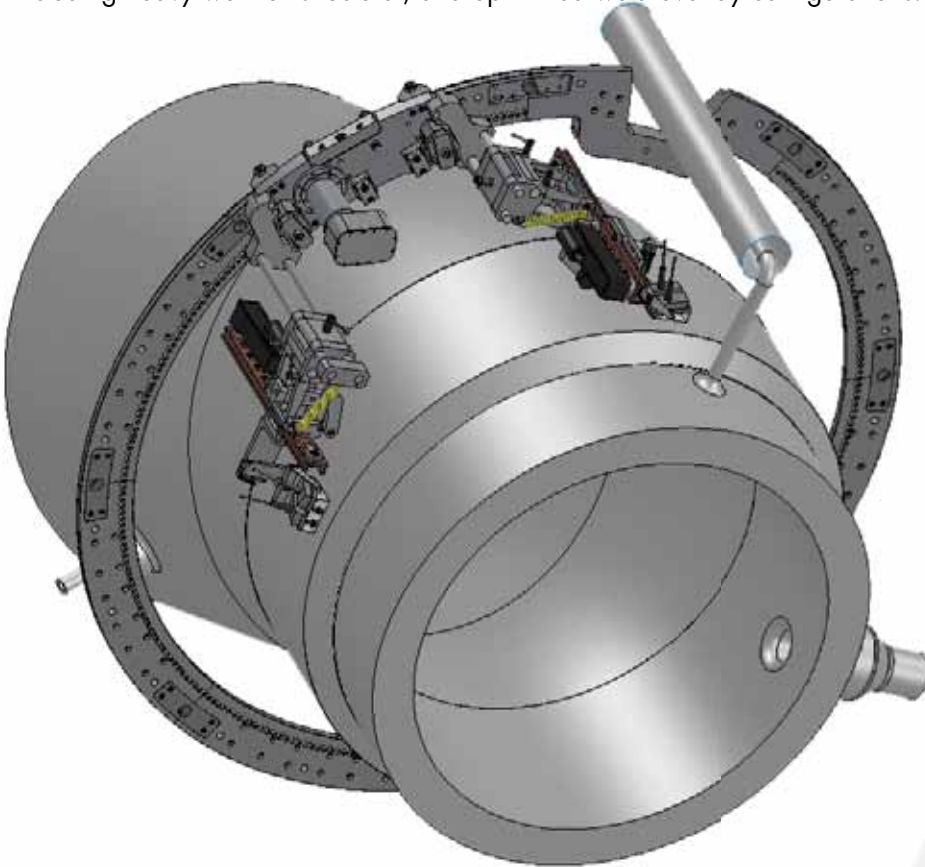
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Structural Integrity has the ability to adapt examinations to complex geometries such as tapered weld surfaces and access restrictions as seen in many pressurizer welds, safety injection systems, and other non-typical examinations.

Structural Integrity has worked with several clients to develop examination applications including modeling of tooling design for automated ultrasonic examination scanning. We also have the ability to model the ultrasonic beam fields through the use of CIVA and solid modeling software to verify that the examination will cover the volume needed and find critical flaws. We can provide NDE Level III oversight and review of specific and complex applications as well as review of scan plans, focal laws, and essential requirements for qualified examinations. We have also assisted with the design and development of demonstration blocks for proving the capability of the ultrasonic examination techniques for specific applications. Structural Integrity possesses ASME Section XI Appendix VIII qualified personnel, equipment, and procedures for the automated / encoded examination of dissimilar metal welds, weld overlay repairs including heavy wall full structural, and optimized weld overlay configurations.



#### **SUMMARY**

Structural Integrity Associates has the ability and technology for providing our clients with:

- *ASME Section XI Appendix VIII qualified automated / encoded ultrasonic examination services*
- *Computer modeling for the demonstration of UT processes through use of solid models and CIVA*
- *Design and Fabrication of scanners specifically for custom applications and configurations*
- *Assistance in design of demonstration specimens*
- *Training for our clients and their personnel in the application of advanced phased array ultrasonic applications*
- *Third Party NDE Level III oversight or review of NDE Services*

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