Eddyfi Technologies
Beyond current

Applications
Brochure

NON-INTRUSIVE INSPECTION (NII)

Holistic inspection approach using advanced ultrasonic systems

Everything you need for a confident integrity assessment.

Solution driven packages to cover the growing demand for non-intrusive inspection (NII) and provide full coverage of pressure systems and components.

COMBINING TECHNOLOGIES FOR COMPLETE INSPECTION

Historically, periodic inspection of pressure systems has involved vessel entry and visual assessment. The very nature of Internal Visual Inspection (IVI) requires plant shutdown, extensive cleaning programs, and confined space work environments. This combination is time consuming, costly, and introduces safety concerns for operators.

Recent developments in Non-Destructive Testing (NDT) technology has introduced a range of inspection tools and scanning equipment that can reliably test pressure system components without the requirement for plant shutdown. Carefully combining the use of specifically designed inspection methodologies, it is now possible to provide close to 100% coverage on commonly designed pressure systems. This integrity strategy is NII.

ADVANCED NDT TECHNIQUES

- Corrosion mapping (automated/semi-automated)
- Weld root erosion/corrosion
- Flange face corrosion
- Nozzle weld inspection
- Surface crack assessment
- Manual phased array

WELD ROOT EROSION

Time of Flight Diffraction (TOFD) is an advanced ultrasonic inspection method that is used primarily for weld inspection. Weld root erosion or corrosion usually occurs below the area of the weld cap, therefore direct inspection using ultrasonic 0° techniques is not possible without weld cap removal. TOFD uses a probe on either side of the weld cap and is recognized as the most reliable method for detection and sizing of weld root erosion or corrosion.

WI scanner is specifically designed with this application in mind:

- Accurate probe separation control.
- Magnetic wheels with braking system.
- Modular design for one-sided access (flange and elbow welds).

Figure 1: Weld inspection of pipework utilizing LYNCS and Mantis.

CORROSION MAPPING

Ultrasonic corrosion mapping is a non-intrusive inspection technique that maps material thickness using Ultrasonics. Variations in material thickness due to corrosion can be identified and graphically portrayed as an easy to interpret 3D data set.

- Automated mapping of shell: Nav2 Crawler
- Restricted areas and dome ends: NDT Sweeper
- Vessel shell and associated pipework: LYNCS CM

Figure 2: Nav2 Crawler.

FLANGE FACE CORROSION

With timely advances in Phased Array Ultrasonic Testing (PAUT) technology it is now possible to replace expensive visual inspection of flange face corrosion with an in-service non-invasive approach. This technique is endorsed by industry and detailed in Recommended Practice (HOIS(11)R7 Issue 2).

- No surface preparation required.
- No need to split the flange joint.
- Instantaneous and fully quantitative results.

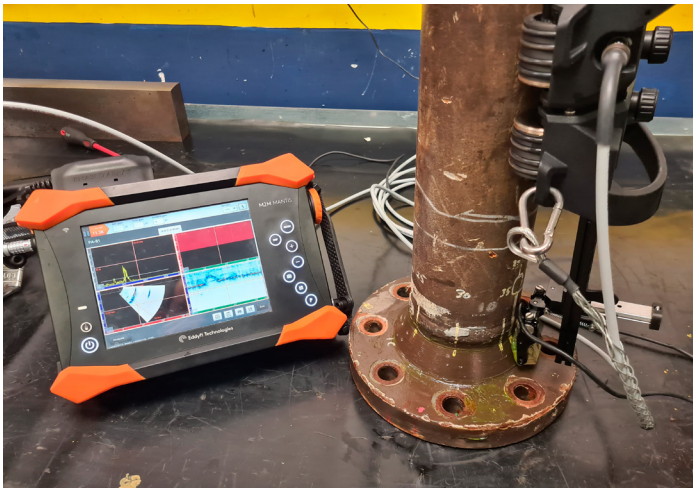

Figure 3: Flange face corrosion assessment with LYNCS and Mantis.

MANUAL PHASED ARRAY

All pressure vessel and piping systems are different. Although there are systems to cover most components and surface conditions, there are often complex areas requiring manual assessment and dedicated probes. Using inspection instruments and Capture™ software, setups can be created to inspect these complex areas:

- Nozzle and branch welds
- Bolt inspection
- Fatigue cracking assessment

Figure 4: PAUT probe 2D Matrix Array mouted in nozzle scanner

PRODUCTS

GEKKO®

An advanced multi-technology instrument with UT, PAUT, TOFD, and TFM. Designed for the most advanced inspections.

More information on Gekko

Figure 5: Gekko inspection instrument.

MANTIS™

Lightweight version of the Gekko, utilizing the same technologies and software. Ideal for high-resolution corrosion mapping.

More information on Mantis

Figure 6: Mantis inspection instrument.

AUTOMATED SOLUTION

Remote access and battery operated, automated robotic scanner designed for high speed corrosion mapping of large areas.

More information on Automated Solution

Figure 7: Nav2 Crawler

NDT SWEEPER

Ideal for the corrosion mapping of complex geometries including curved surfaces, pipelines, and restricted access areas.

More information on NDT Sweeper

Figure 8: NDT Sweeper.

LYNCS™ FULL

A multifunction hybrid scanner designed for phased array corrosion mapping and weld inspection with up to 6 PAUT/TOFD probes. The versatile scanner with onboard controls is ideal for solutions from 100mm (4in) diameter up to flat plate.

More information on LYNCS

Figure 9: LYNCS WI Weld Inspection Scanner.

Figure 10: LYNCS CM Corrosion Mapping Scanner.

Selecting the correct equipment and technology is vital to a successful Non-Intrusive Inspection campaign. Combining the Mantis or Gekko with the NDT Sweeper and LYNCS scanner, operators can complete 90% of a vessel and associated pipework inspection.

- There are significant advantages to performing an NII inspection over an Internal Visual Inspection (IVI), such as:
- Removing the risks associated with confined space access which can be hazardous and may also require upgraded protective equipment and systems such as lighting and a breathing apparatus.
- Eliminating the requirement to break containment/ isolation/drainage and purge the vessels under evaluation.
- Reducing shutdown/turnaround times, NII can be carried out before a shutdown event allowing the turnaround to be restricted to repair/maintenance work. This also allows for advanced planning.
- Minimizing disturbance to the vessel which may create new anomalies.
- Allowing the inspection to be performed as soon as an issue has been identified.
- Identifying metallurgical defects that would not be identified during an IVI.
- Calculating remaining plant life of operational equipment by engineers via periodic NII inspections.

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