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by NDT CORNER

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Volume. 5 - Q1.2024

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WELDING TECHNOLOGIES

MECHANICAL

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NDT SCOOP

INSPECTION MAGAZINE

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ON THE COVER

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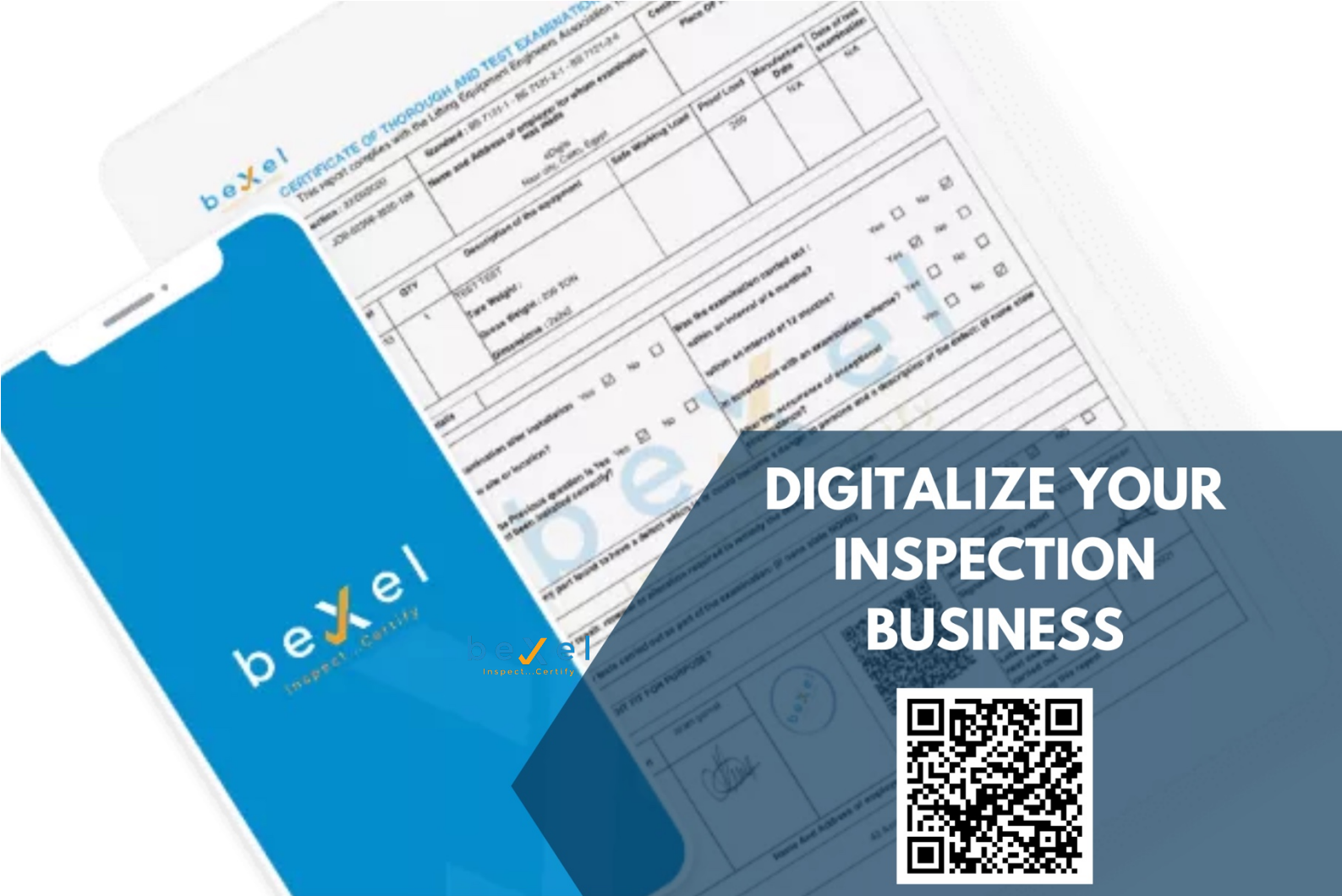
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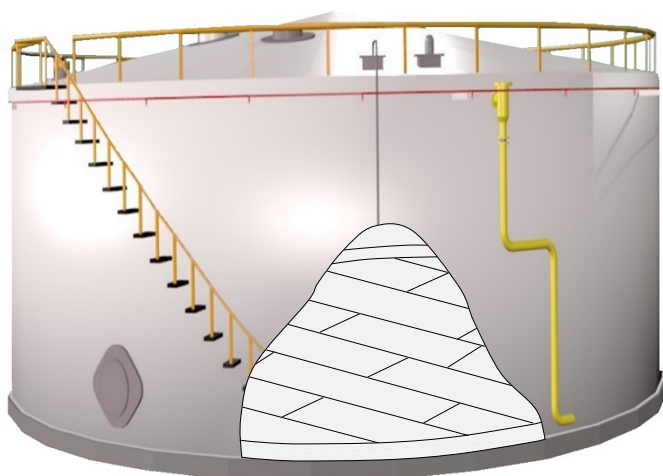
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PLANT EQUIPMENT INSPECTION

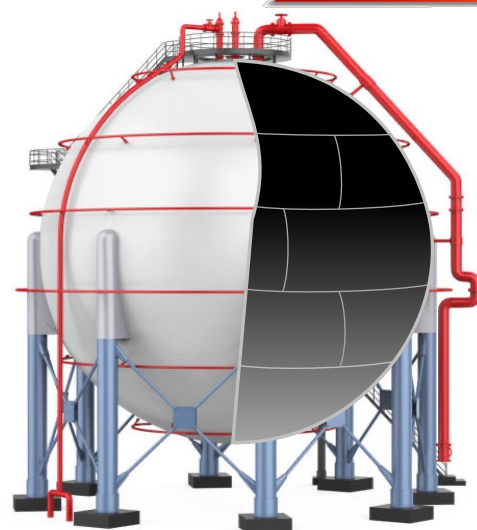
Storage Tanks Integrity

Q1 2023 ISSUE
FULL DETAILS



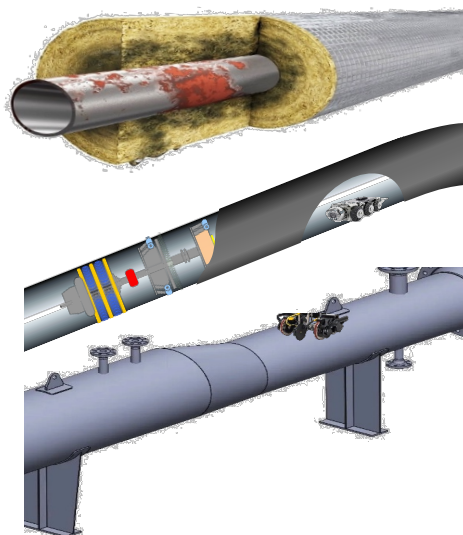
LPG Tanks Integrity

Q4 2023 ISSUE
FULL DETAILS



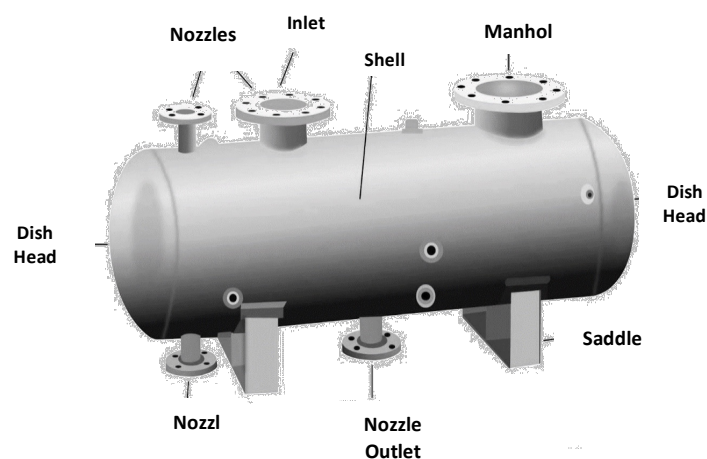
Pipelines Integrity

Q3 2023 ISSUE
FULL DETAILS



Vessels Integrity

Q2 2023 ISSUE
FULL DETAILS





HOW TO INSPECT AST STORAGE TANKS?

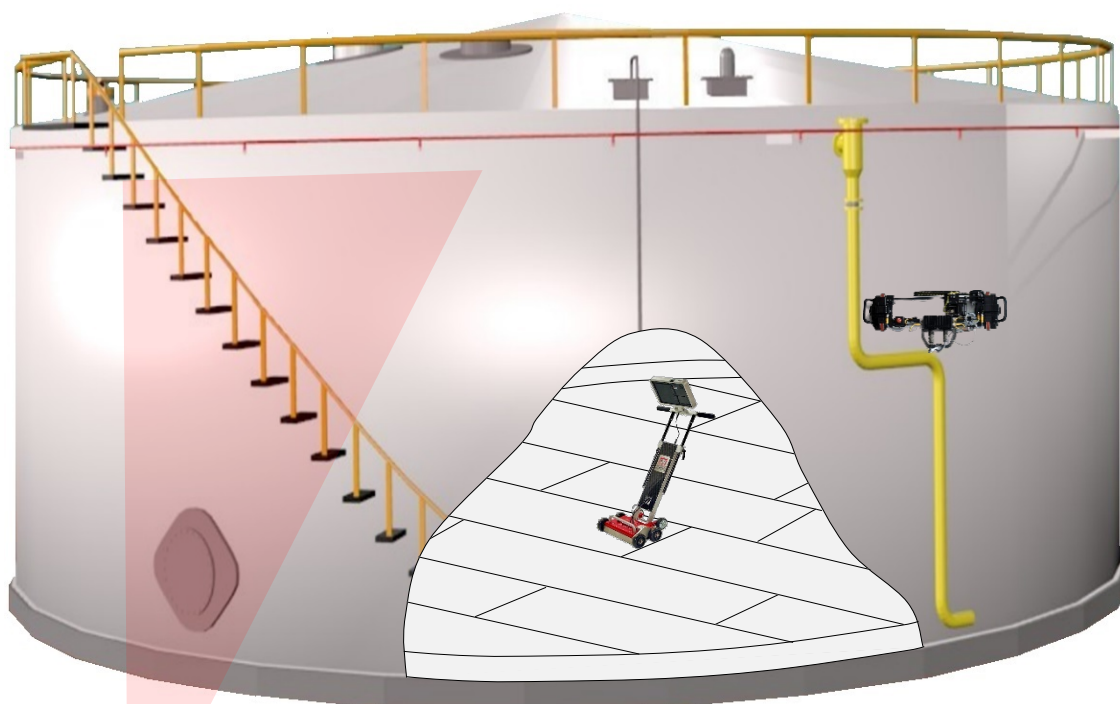
AST Tanks Integrity

ROOF PLATES

- AUT Corrosion Mapping

INTERNAL ROOF

- Drones if not access.
- UT with A-SCAN



TANK CALIBRATION

- 3D Laser Scan

FLOOR INNER PLATES

- MFL MARK IV Floor Inspection
- UT with A-SCAN
- Robotic UT (In-service)

FLOOR ANNULAR PLATES

- MFL Edge Inspection
- UT with A-SCAN
- Robotic UT (In-service)
- Short Range-UT (In-service)

SHELL PLATES

- HSR AUT Corrosion Mapping
- UT with A-SCAN

FLOOR WELDS

- UT FD / Shear Wave
- Phased Array
- Vacuum Box

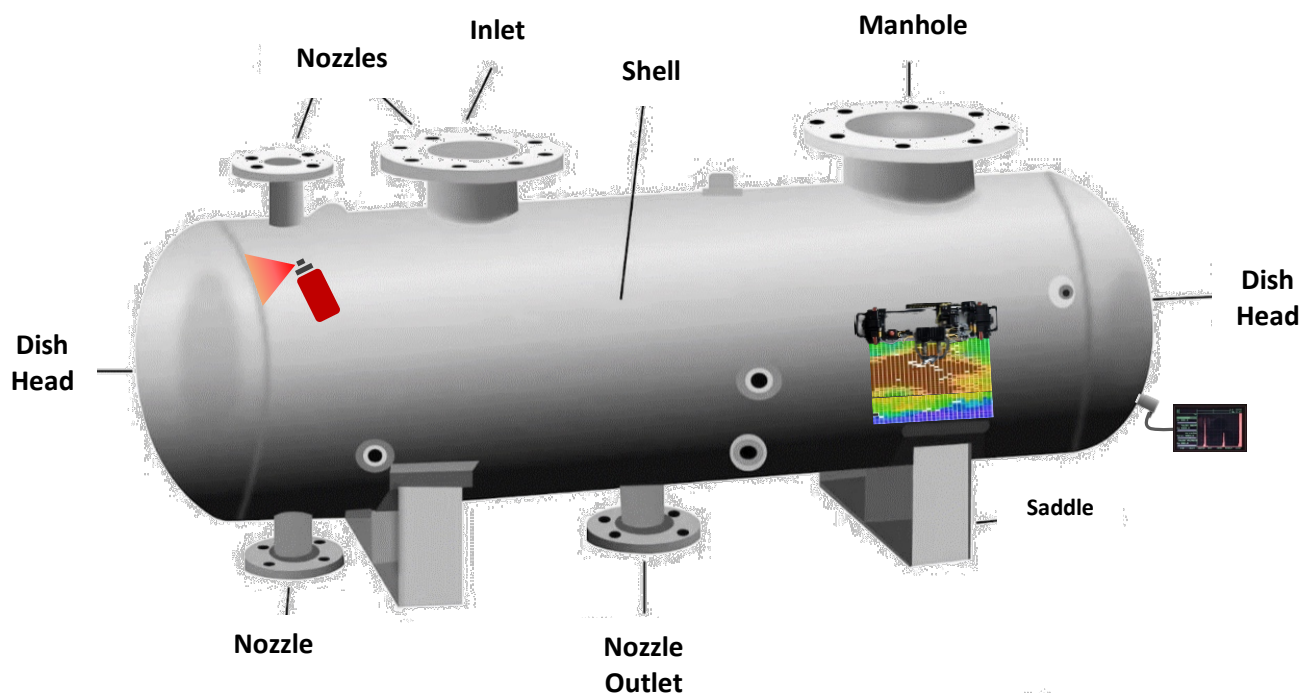
NOZZLE WELDS

- MT
- UT FD
- Phased Array



HOW TO INSPECT PRESSURE VESSEL?

Pressure Vessel Integrity

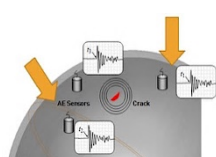


WELDS

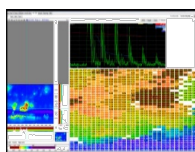
- MT/ PT
- UT FD / Shear Wave
- Phased Array (PAUT)
- EC for surface cracks

SHELL PLATES

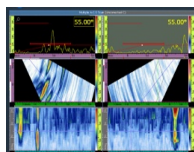
- Automatic UT Corrosion Mapping
- UT with A-SCAN / UT Grid Scan
- Visual Test / PAUT for corrosion
- Pulsed EC for insulated Vessels
- Acoustic Emission



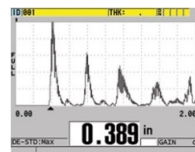
Acoustic Emission



AUT scan



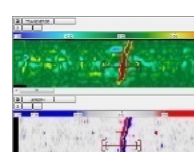
PAUT scan



UT scan



UT grid scan

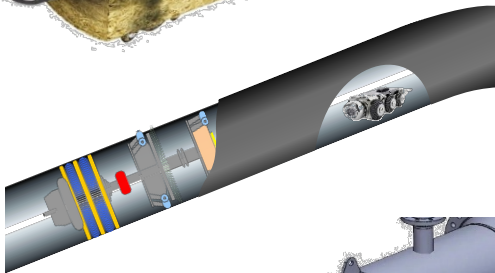
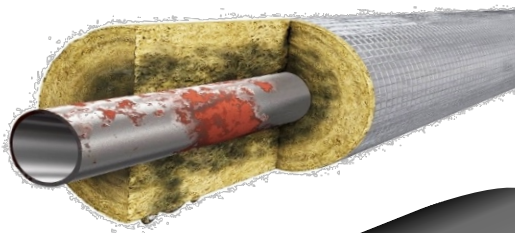
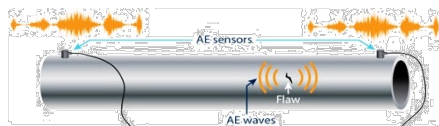


ECT scan



HOW TO INSPECT PIPELINES?

Pipelines Integrity



INSPECTION OVER INSULATION

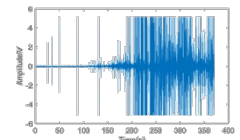
- Pulsed Eddy Current
- LRUT Guided Wave
- Digital RT
- Acoustic Emission

INTERNAL INSPECTION

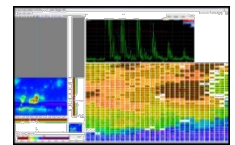
- Smart/Intelligent Pig
- Remote Visual Inspection (RVI)

EXTERNAL INSPECTION

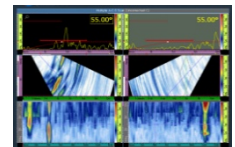
- Automatic UT Corrosion Mapping
- PAUT & Hydro-form Corrosion Mapping
- MFL Pipe Scan
- LRUT Guided wave.
- EMAT (Surface & Subsurface)
- Thermal Imaging
- UT grid with A Scan feature.
- Acoustic Emission



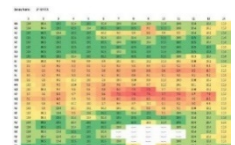
Acoustic Emission



AUT Scan



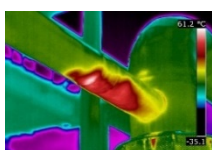
PAUT Scan



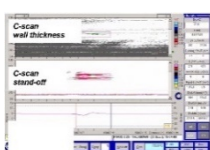
UT Grid Scan



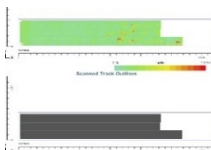
Digital RT



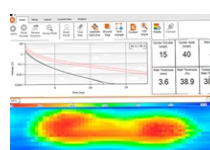
Thermal Imaging



Smart Pigging



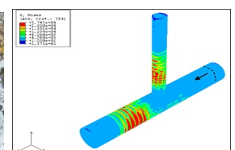
MFL Scan



ECT Scan



RVI Image



LRUT Test



HOW TO INSPECT SPHERE TANKS?

LPG Tanks Integrity

SHELL PLATES

- HSR AUT Corrosion Mapping
- RAT / UT with A-SCAN

EXTERNAL INSPECTION INSPECTION OVER INSULATION

- Pulsed Eddy Current
- Digital RT
- Acoustic Emission

INTERNAL INSPECTION

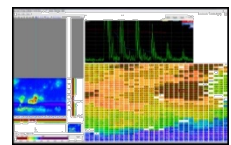
- Visual Test (VT)
- Penetrant Test (PT)
- Magnetic Test (MT)

Welds & Surface Defects

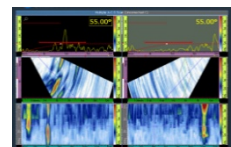
- PT & MT Tests

SUPPORTS INSPECTION

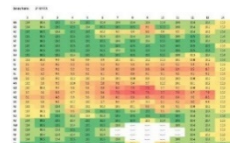
- Pulsed Eddy Current
- Guided Wave



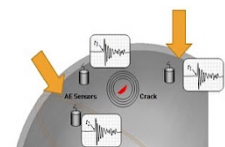
AUT Scan



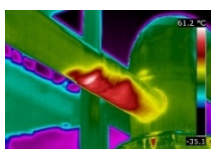
PAUT Scan



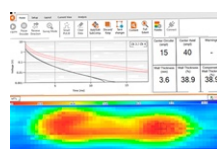
UT Grid Scan



Acoustic Emission



Thermal Imaging



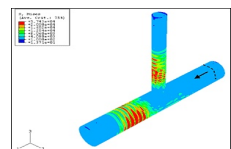
ECT Scan



MT Test



PT Scan



LRUT Test

Conventional NDT used for internal Inspection!

Most common methods are Visual Testing, Magnetic Particle Testing, Penetrant Testing, Ultrasonic Testing, Radiographic Testing and Eddy Current. In these tests, defects such as corrosion, cracks, decrease in wall thickness or gaps in internal structures are identified in ferritic and austenitic steels, aluminum alloys, nickel, copper and titanium alloys during production or usage. Non-destructive testing methods can change depending on the procedure, size, thickness, and structure of the material.

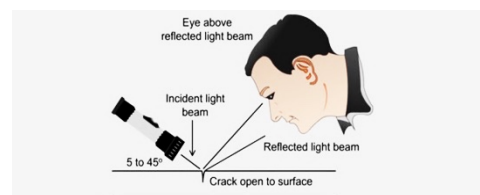
Visual Inspection.

VT is the fastest and cheapest method of Non-destructive testing. It's the first step of every inspection before any other Non-destructive test starts. When performing visual test with naked eye, equipment such as magnifying glass, light source, borescope, and mirror can also be used.

The condition of the surface is important to detect discontinuities such as cracks, porosities, and undercuts. Required cleanings must be finished before visual testing starts. surface cleaning is very important.

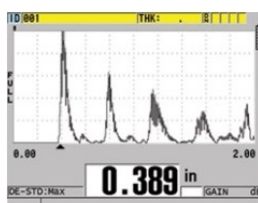
Visual Testing is perhaps the oldest and most widely used inspection technique. Often the eyes of the inspector are the only "equipment" used for the inspection. Visual Inspection is applicable to virtually any material, at any stage of manufacture, at any point in its service life. **To perform a successful direct visual examination, adequate lighting and good inspector eyesight is required.**

VT seems like an easy method, but it has its own inspection terms, and the experience of the staff is important. Test should be performed under enough light, minimum 500 lux, with an angle not lower than 30° and the distance between eye and the surface shouldn't be less than 300 mm.



Ultrasonic Testing

Wall Thickness & Metal Loss measurements using UT Thickness Gauges includes A-scan feature to able to detect corrosion failure and display reading in Digital & A-scan view.



Magnetic Testing

MT is essentially a surface-type examination, although some imperfections just below the surface are detectable. This type of examination is limited to materials which can be magnetized (hence it is not appropriate for austenitic stainless steels). An area to be examined by magnetic particle examination can be completely examined or examined on a random sampling basis, as specified.



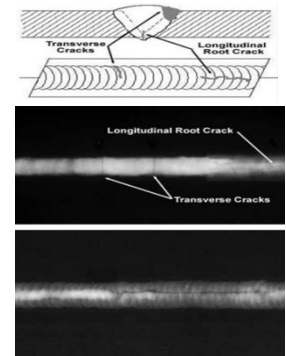
Penetrant Testing

PT is a method to detect surface-connected defects. It is important to have a clean and smooth surface. After mechanical, chemical precleaning the surface must be dry and any dirt such as rust, oil, or paint should be cleaned from the surface as it will affect the process. The biggest advantage of this method is it has no restrictions about the material.



Radiography Testing

Random RT X-ray or gamma ray radiography may be used. The selection of the method should be dependent upon its adaptability to work being radiographed. When random radiography of welds is specified by the engineering design, it should be done on the number of welds designated. The engineering design shall specify the extent to which each examined weld should be radiographed. Random radiography may also be used for examination of piping components such as a valve or fitting to any extent specified by the engineering design.



Advanced NDT used for internal & external inspection!

Most common methods are Phased Array UT, Automatic UT Corrosion Mapping, Acoustic Emission, Pulsed Eddy Current, Short Range guided wave. In these tests, you will have a permanent record and digital report for corrosion assessment. Defects such as corrosion, cracks, decrease in wall thickness or gaps in internal structures are identified in ferritic and austenitic steels, aluminum alloys, nickel, copper and titanium alloys during production or usage. Non-destructive testing methods can change depending on the procedure, size, thickness, and structure of the object need to inspect.

Ultrasonic Thickness Grids Measurement

UT Grid scan with spot digital reading & A-scan.

An ultrasonic thickness gauge works by precisely measuring how long it takes for a sound pulse that has been generated by a small probe called an ultrasonic transducer to travel through a test piece and reflect from the inside surface or far wall. From this measurement, the thickness of the test piece is calculated and displayed on a digital screen. The portability of the testing equipment allows for on-site inspection and results are instant. If a problem has been detected by the technique, additional non-destructive testing methods can be used to further investigate the findings.

Manual point thickness measurements using conventional ultrasound (UT) is a widely used technique for monitoring corrosion in many infrastructure applications. Depending upon the nature of the corrosion (e.g., localized, versus generalized and pitting), an inspector typically records the minimum thickness reading within a small area (usually 1 in.2). This however can lead to inconclusive inspection data due to minimal coverage of large areas, operator variability, lack of pitting or localized corrosion detection, and inadequate data reporting and analysis.



Automatic UT Mapping Ultrasonic technique using powered scanners.

AUT is using mechanical scanners with magnetic wheels to only adhere purposes to locate inherent defects within a given material. AUT is the term used to describe corrosion mapping inspections, pulse-echo weld inspection, Phased Array and Time of Flight Diffraction.

Typical Automated Corrosion mapping systems can inspect 20-30 sq. meters per standard workday. The benefit of using the automated imaging systems allows a picture (C-Scan Image) quickly identifies any significant reduction in wall thickness. These automated corrosion mapping scans can then be superimposed into development drawings of equipment and accurately indicate location of problem regions. The images on this page show some significant problems detected from field inspections.

Automated Corrosion Mapping Ultrasonic scans of materials, uses a range of colors to represent the thickness range of part being inspected, typically blue colors are used to represent nominal wall thickness with orange and red colors used to indicate significant wall reduction.

Mapping of pipelines for follow up of Smart Pig surveys and Long-Range UT (LRUT) programs allows accurate assessment of localized areas of concern. Due to the speed of modern systems considerable coverage can be completed daily. If you have a critical system and you require 100% coverage for process reliability, then this is the solution you require.

Phased Array UT Inspect large surface areas quickly with high resolution.

Inspect large surface areas quickly with high resolution. Typically, a thickness reading is performed every 1 mm2, which represents 500 more sample points than conventional ultrasound. This high resolution makes it possible to detect small, localized indications, such as corrosion pits, and it enables the operator to profile the shape of the corroded area.

Intuitive and affordable phased array instruments are now commercially available. These devices are easy to setup so users can record and archive data for further analysis. Easy-to-read images make interpreting acquisition data straightforward. The data can then be used to perform corrosion assessments according to ASME B31G and other applicable standards.

Multiplexing, sometimes called an electronic or linear scan, is used to perform corrosion monitoring. The sensor consists of a long-phased array probe, 25-100 mm (1-4 in.) with between 32 and 128 elements. A small group of elements, defined as the active aperture, is activated to generate an ultrasonic beam propagating normal to the interface. This group of elements is then indexed using electronic multiplexing, creating a true physical movement of the ultrasonic beam under the array with an index as small as 1 mm (0.040"). The electronic indexing is performed so fast that a 4-inch (100 mm) line length is covered by the ultrasonic beams in milliseconds. The travel time of these beams is used to determine the component's thickness at each acquisition point.

Pulsed Eddy Current Inspection over Insulation to determine the condition of pipes and monitor corrosion.

PEC technology does not require direct contact with a test object nor specific surface cleaning, making inspection fast and easy even at high temperatures and on offshore wells. Inspections can be conducted, and corrosion can be monitored during operation to allow for planned maintenance and repairs to be scheduled and carried out at times optimal for your business.

Pulsed Eddy Current readings conducted many times at the same location can be reliably reproduced regardless of casing, coatings, or insulation. PEC technology provides results with a plus/minus 10% accuracy for corrosion detection and a plus/minus 0.2% accuracy rate for corrosion monitoring. Moreover, Pulsed Eddy Current inspections can be successfully and easily carried out at temperatures ranging from -100° C to 500° C (-150°F to 932°F).

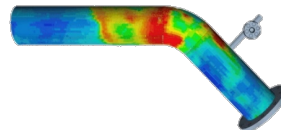
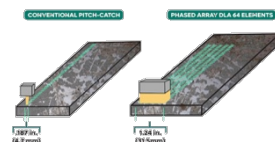
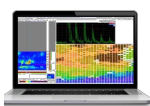
Pulsed Eddy Current technology is based on electromagnetics and provides average wall thickness values over the probe footprint area. It measures and compares the percentage variation in average wall thickness throughout an object. Pulsed Eddy Current can be effectively applied for corrosion detection and monitoring on pipes and vessels made of carbon steel or low-alloy steel without contacting the steel surface itself. PEC technology allows measurements to be made through insulation, concrete, or corrosion barriers.

Acoustic Emission

When a material with defects is subjected to mechanical stress or load, it releases energy. This energy travels in the shape of high-frequency stress waves. These waves or fluctuations are obtained with the utilization of sensors which in turn transforms the energy into voltage. This voltage is electronically overstated with the utilization of timing circuits and later refined as acoustic emission signal data.

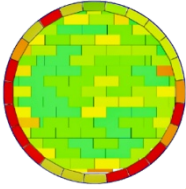
AE refers to the generation of transient elastic waves produced by a sudden redistribution of stress in a material. When a structure is subject to an external stimulus (change in pressure, load, or temperature), localized sources trigger the release of energy, in the form of stress waves, which propagate to the surface and are recorded by sensors. With the right equipment and setup, motions on the order of picometers (10 - 12 m) can be identified. Sources of AE vary from natural events like earthquakes and rock bursts melting, twinning, and phase transformations in metals. In composites, matrix cracking and fiber breakage and debonding contribute to acoustic emissions. AE's have also been measured and recorded in polymers, wood, and concrete, among other materials.

Need more, read Edition# 3



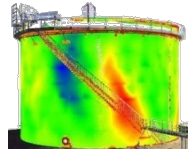
Detailed Inspection Methods & Reporting

MFL Report



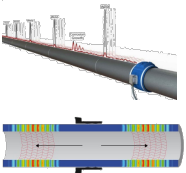
C-Scan corrosion mapping Layout produced by using Magnetic Flux Leakage Corrosion Mapping Inspection to detect corrosion in quick manner to provide the hot spots & corroded areas.

3D Laser Report



Tank Calibration, geometrical & structure analysis using 3D laser scanner, aimed to verify the compliance with API 650 & API 653.

LRUT



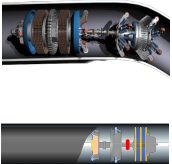
LRUT provides rapid screening for corrosion and erosion, also known as guided wave ultrasonic testing, is a fast and cost-effective method for inspecting long lengths of pipe. Hundreds of meters of pipe can be screened in one day from one single location and the technique can inspect 100% of the pipe wall.

DR RT



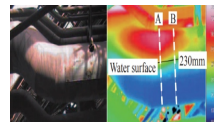
A Computed Radiography to create an instant Image. Digital Radiography (DR) is an advancement of traditional Film Radiography. This technique utilizes a DDA (Digital Detector Array) instead of Film or CR (Computed Radiography) to create an instant Image. Besides performing "standard" Radiography work, DR opens new opportunities such as fast and accurate wall thickness measurements and Corrosion monitoring.

Smart Pigging



Pigging is an in-line inspection (ILI) technique. Smart pigs use nondestructive examination techniques such as UT and MFL testing to inspect for erosion corrosion, metal loss, pitting, weld anomalies, and hydrogen induced cracking, among others. They are also able to gather data on the pipeline's diameter, curvature, bends, and temperature.

Thermal Image



Thermal imaging is the technique of using the heat given off by an object to produce an image of it or to locate it. In essence, a thermal imaging camera measures variations in heat, or infrared radiation, and represents the heat as different colors in an image.

MFL Pipe Scan



MFL provides rapid screening for corrosion and erosion. The Magnetic Flux Leakage (MFL) is a Non-destructive testing (NDT) approach. It is used on ferromagnetic material if lined or unlined. MFL is a rapid, reliable, and robust corrosion screening technique that detects the volume of missing magnetic material in a component under inspection.

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- Tank calibration.

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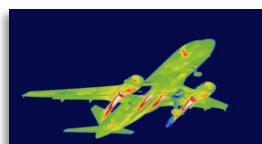
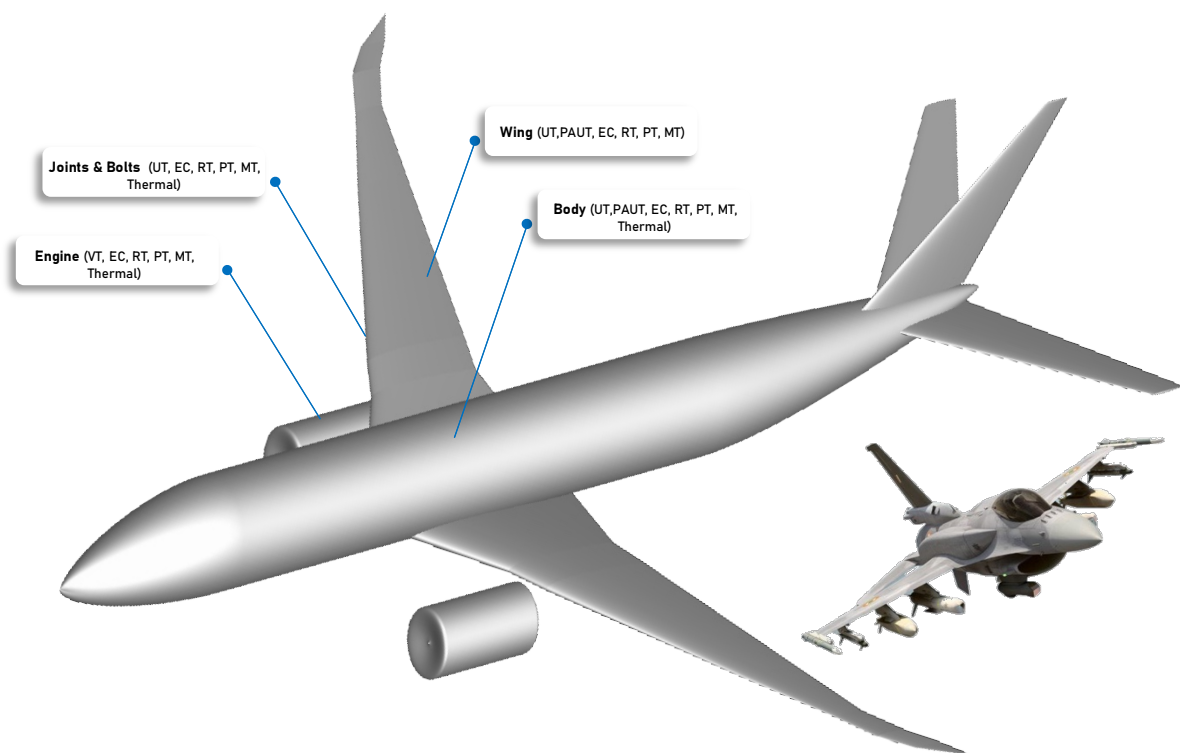


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HOW TO INSPECT AIRCRAFT?

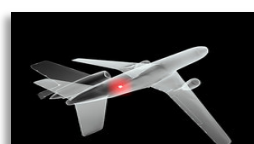
AIRCRAFT INTEGRITY



Thermal Imaging



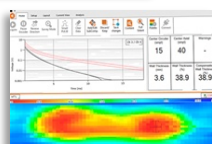
Visual Test



RT Scan



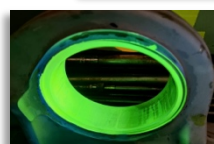
UT Test



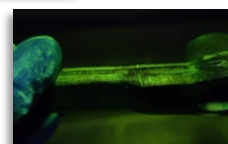
ECT Test



PAUT Test



Fluorescent PT



Fluorescent MT

NDT and Aircraft Maintenance

A 50mm crack may not raise concerns on a ship's deck, but a 1mm crack on an aircraft can quickly disrupt weekend plans. To detect such defects, several common methods are employed, each with its unique strengths and applications.



NDT AND AIRCRAFT MAINTENANCE

Consistently Planned maintenance is an integral part of guaranteeing the aircraft safety.

A wide scope of NDT methodology guarantees that not a solitary fabricated part achieves service without first finishing a progression of stringent tests.

Today, NDT is trusted as an assurance for safety in the aviation field," airplane endures numerous sorts of basic breakdown including erosion, corrosion, fatigue, imperfections, fabrication defects, operation and maintenance, and unforeseen loading.

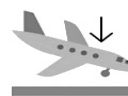
In airplane support, it is basic to assess surfaces for any harm that may exist to decide the degree of fix work required, regardless of whether that happens as the consequence of manufacturing or while the aircraft is in service. During Planned maintenance, non-destructive testing (NDT) is one of the fastest, most affordable approaches to perform assessments, and the best way to find a defect that is not noticeable to the unaided eye.

NDT is utilized to discover flaws on and under the surface, just as to identify leaks, decide the area of basic structural insufficiencies, and decide dimensional measurements.

AIRPLANE PARTS TO INSPECT

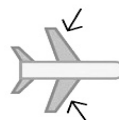
1. Surface and subsurface defects,
2. Main structural fittings of landing gear legs,
3. Engine attachments,
4. Aircraft structure joints and pylons,
5. Bolts located in critical areas,
6. Adhesive bond quality of lap joints and composite structure.

5 Main Components of an Aircraft



Fuselage

The long hollow tube that holds passengers and cargo, also known as the body of the airplane.



Wings

Also known as foils, the wings generate the lifting force needed for flight. The wings are in the middle and back of aircraft.



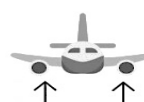
Empennage

The tail end of the aircraft is the empennage, which helps with stability using assistance from the rudder and elevator.



Power Plant

The engine and propeller make up the power plant.



Landing Gear

A plane can't function without landing gear. Shock absorbers and wheels are part of the landing gear.

Conventional NDT used for Aircraft Inspection!

Most common methods are Visual Testing, Magnetic Particle Testing, Penetrant Testing, Ultrasonic Testing, Radiographic Testing and Eddy Current. In these tests, defects such as corrosion, cracks, decrease in wall thickness or gaps in internal structures are identified in ferritic, aluminum alloys, nickel, copper and titanium alloys during production or usage. Non-destructive testing methods can change depending on the procedure, size, thickness, and structure of the material.

VISUAL INSPECTION

VT is the fastest and cheapest method of Non-destructive testing. It's the first step of every inspection before any other Non-destructive test starts. When performing visual test with naked eye, equipment such as magnifying glass, light source, borescope, and mirror can also be used.

The condition of the surface is important to detect discontinuities such as cracks, porosities, and undercuts. Required cleanings must be finished before visual testing starts. surface cleaning is very important.

Visual Testing is perhaps the oldest and most widely used inspection technique. Often the eyes of the inspector are the only "equipment" used for the inspection. Visual Inspection is applicable to virtually any material, at any stage of manufacture, at any point in its service life. To perform a successful direct visual examination, adequate lighting and good inspector eyesight is required.

VT seems like an easy method, but it has its own inspection terms, and the experience of the staff is important. Test should be performed under enough light, minimum 500 lux, with an angle not lower than 30° and the distance between eye and the surface shouldn't be less than 300 mm.



Ultrasonic Testing

Wall Thickness & Metal Losses measurements using UT Thickness Gauges includes A-scan feature to able to detect corrosion failure and display reading in Digital & A-scan view.

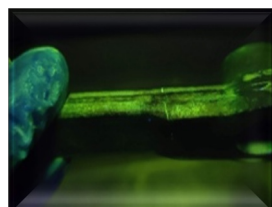
UT uses in the aerospace industry detection of: Surface & subsurface defects, Main structural fittings of landing gear legs, engine attachments, Aircraft structure joints and pylons, Bolts located in critical areas, Adhesive bond quality of lap joints and composite structure, Thickness measurement after damage or corrosion removal.



Magnetic Testing

MT is essentially a surface-type examination, although some imperfections just below the surface are detectable. This type of examination is limited to materials which can be magnetized (hence it is not appropriate for austenitic stainless steels). An area to be examined by MT can be completely examined or examined on a random sampling basis, as specified.

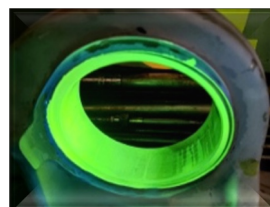
Fluorescent MT: This method is suitable for materials that can be magnetized, primarily detecting surface and slightly sub-surface defects.



Penetrant Testing

Liquid penetrant testing is another simple and speedy strategy broadly utilized in the aerospace to recognize surface deformities and basic harm in non-porous materials.

PT is a method to detect surface-connected defects. It is important to have a clean and smooth surface. After mechanical, chemical precleaning the surface must be dry and any dirt such as rust, oil, or paint should be cleaned from the surface as it will affect the process. The biggest advantage of this method is it has no restrictions about the material.



Radiography Testing

RT in aerospace can utilize both x-Ray beams for thin materials and gamma beams for thicker materials. Generally, film has been utilized to capture the picture yet is being supplanted by computerized strategies.

A further ongoing development is 3D Computer Tomography (CT) checking, which capture multiple x-Ray of a test article to develop a cross-area perspective on the specimen on a computer monitor.



Advanced NDT used for Aircraft Inspection!

Most common methods are Phased Array UT, UT Corrosion Mapping, Eddy Current, Thermal Imaging. In these tests, you will have a permanent record and digital report for corrosion assessment. Defects such as corrosion, cracks, decrease in wall thickness or gaps in internal structures are identified in ferritic, aluminum, nickel, copper and titanium during production or usage. The NDT methods can change depending on the procedure, size, thickness, and structure of the object need to inspect.



NDT METHODS

NDT applications not only in aviation but also in general engineering.

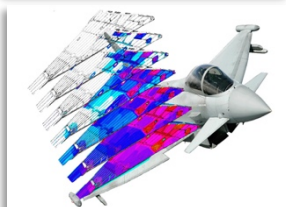
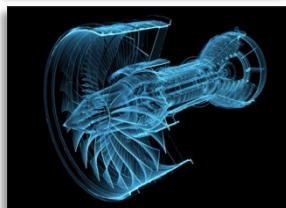
The disparity lies in what is deemed acceptable.

A **50mm** crack may not raise concerns on a ship's deck, but a **1mm** crack on an aircraft can quickly disrupt plans.

To detect defects, several methods are employed, each with its unique strengths and applications.

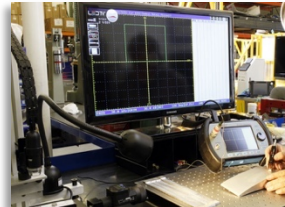
PHASED ARRAY UT

Phased array inspection for full aluminum aircraft skin for scribe marks and for cracks originating at fastener holes in lap-splice joints.



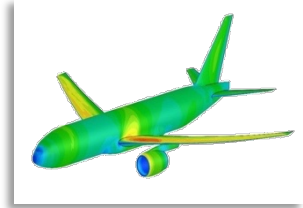
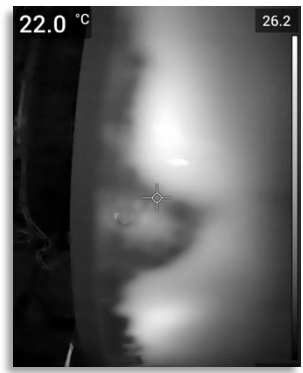
EDDY CURRENT

Eddy Current is extensively used on electrically conductive materials, offering limited penetration. It necessitates the analysis and interpretation of flaw detector signals for surface and subsurface.



THERMOGRAPHY

A relatively modern method, thermography employs infrared cameras to scrutinize thermal patterns on surfaces, primarily for detecting water ingress in composites.





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ALIGNING

Asset Management Strategies with Turnaround Planning

Asset management and turnaround planning are two critical components of any successful business operation. However, many companies struggle to effectively align these two strategies, leading to inefficiencies, increased costs, and missed opportunities for improvement. In this article, we will explore the importance of aligning asset management strategies with turnaround planning and provide practical tips for achieving this alignment. By integrating these two essential processes, organizations can optimize their resources, improve operational performance, and ultimately drive greater value for their stakeholders.

We will delve into the key considerations for integrating asset management and turnaround planning, including the role of data-driven decision-making, cross-functional collaboration, and the implementation of technology solutions. Additionally, by understanding the synergies between asset management and turnaround planning, businesses can proactively manage their assets, minimize downtime, and enhance their overall competitiveness in the market. Here is the critical link between asset management and turnaround planning and uncover the potential for driving sustainable business success.

- **Asset Criticality Assessment:** Conduct a thorough assessment of asset criticality to identify key equipment and components that have a significant impact on production, safety, and environmental performance. Understanding the criticality of assets helps prioritize maintenance activities during turnarounds.
- **Data-Driven Decision Making:** Utilize asset performance data, reliability analytics, and historical maintenance records to inform turnaround planning. Data-driven decision-making ensures that maintenance activities are targeted towards addressing the most critical reliability issues and optimizing the life cycle of assets.
- **Risk-Based Prioritization:** Apply risk-based methodologies to prioritize maintenance tasks and inspections during turnarounds. By focusing on high-risk assets and failure modes, organizations can allocate resources effectively and mitigate potential reliability concerns.
- **Integrated Asset Management Systems:** Implement integrated asset management systems that capture asset performance data, maintenance history, and reliability information. A comprehensive asset management system facilitates informed decision-making and ensures that maintenance activities are aligned with asset management strategies.
- **Cross-Functional Collaboration:** Foster collaboration between asset management, maintenance, reliability, and turnaround planning teams. Effective communication and collaboration between these functions ensure that maintenance activities are aligned with asset management goals and turnaround objectives.
- **Proactive Maintenance Strategies:** Develop proactive maintenance strategies that focus on preventive and predictive maintenance techniques to address potential reliability issues before they escalate. Proactive maintenance can extend the life cycle of critical assets and minimize the need for reactive interventions during turnarounds.
- **Asset Performance Monitoring:** Implement real-time condition monitoring and performance tracking systems to continuously assess the health and performance of critical assets. Monitoring asset performance allows for early detection of potential issues and facilitates targeted maintenance interventions during turnarounds.
- **Continuous Improvement Culture:** Foster a culture of continuous improvement by capturing lessons learned from past turnarounds and maintenance activities. Applying these insights to refine asset management strategies and maintenance practices contributes to extending the life cycle of critical assets.
- **Reliability-Centered Turnaround Planning:** Integrate reliability engineering principles into the turnaround planning process, ensuring that maintenance activities are aligned with asset management strategies. Reliability-centered planning optimizes maintenance efforts and supports the long-term reliability of critical assets.

IN CONCLUSION, the alignment of asset management strategies with turnaround planning is a critical factor in driving operational efficiency and financial performance, particularly in industries such as oil and gas. Companies have demonstrated the tangible benefits of integrating these two essential processes, leveraging advanced technologies and proactive maintenance practices to optimize asset performance and minimize downtime during planned turnarounds. By understanding the synergies between asset management and turnaround planning, businesses can proactively manage their assets, minimize downtime, and enhance their overall competitiveness in the market. As organizations continue to prioritize operational excellence and cost-effective asset management, the successful alignment of these strategies will remain a key differentiator in driving sustainable business success.

Ultimately, the integration of asset management and turnaround planning represents a strategic imperative for organizations seeking to maximize the value of their assets, improve operational efficiency, and achieve long-term success in their respective industries. By embracing this alignment and learning from the successes of industry leaders, businesses can position themselves for sustained growth and resilience in an increasingly competitive global marketplace. As the landscape of asset management and turnaround planning continues to evolve, the imperative for integration will only become more pronounced, making it essential for organizations to prioritize this alignment as a cornerstone of their operational strategy.



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| ▪ Factors of MFL testing | ▪ MFL limitations | ▪ System setup & assembling |
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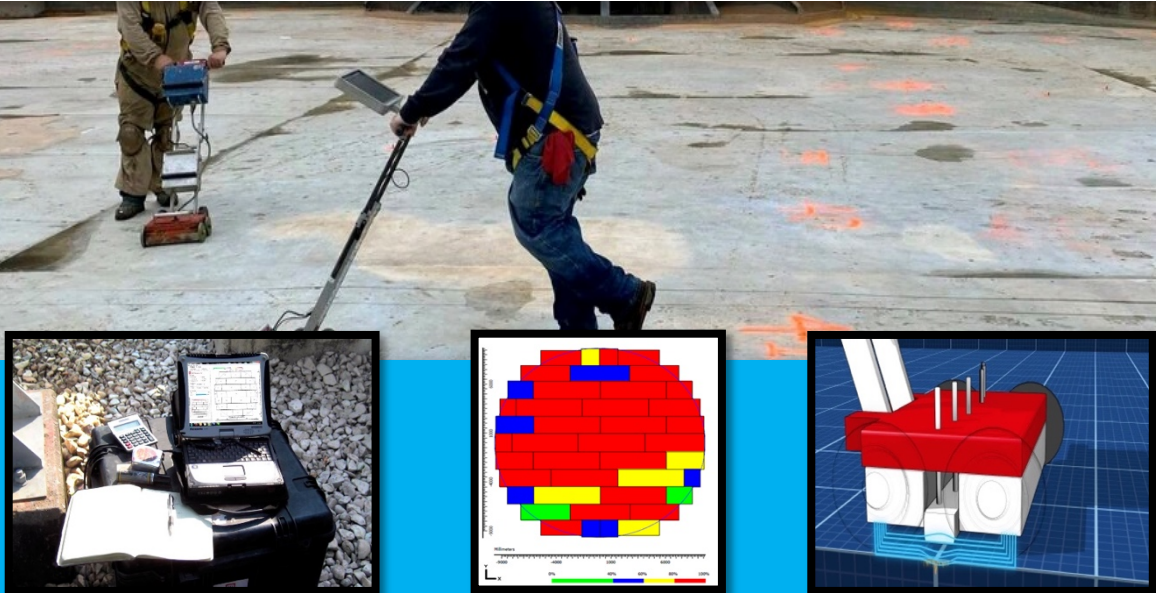
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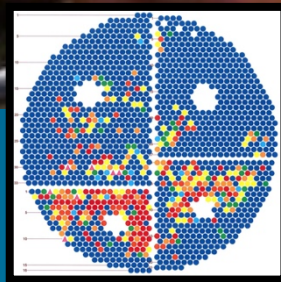
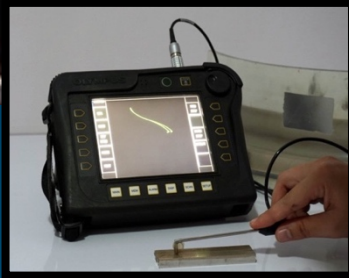
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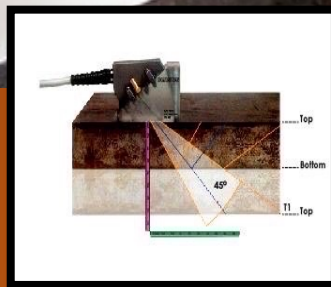
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- ▶ Includes Original ECT HANDBOOK, Classroom, and Hands-on.
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ECT Certifications LEVEL II

COURSE CONTENT

- | | | |
|--------------------------|--------------------|-----------------------------|
| ■ ECT Theory & Basics | ■ ECT Applications | ■ Corrosion profile |
| ■ Factors of ECT testing | ■ ECT limitations | ■ System setup & assembling |
| ■ Calibration | ■ Codes | ■ Inspection process |
| ■ Reporting analysis | ■ Defects | ■ Exercises & Case study |

PAUT PHASED ARRAY UT COURSE



Welding & Corrosion, Base metal Inspection

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- | | | |
|----------------------|-----------------------------|-------------------------------|
| ■ UT Theory & Basics | ■ Scanning operations | ■ Defects & Corrosion profile |
| ■ PAUT Parameters | ■ PAUT limitations | ■ System setup & assembling |
| ■ Calibration | ■ Manual & Mapping scanning | ■ Inspection process |
| ■ Reporting analysis | ■ Defects sizing | ■ Exercises & Case study |

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NDT CORNER is organizing Exhibition and Conference in Inspection, NDT, Welding, Corrosion, and Mechanical.

NDT⁺X
CAIRO EXPO 2024

Date: 07-09 May 2024
Location: EIEC – New Cairo - Egypt
Duration: 3 Days
Website: Expo.ndtcorner.com

The Asset Integrity and NDT activities receive powerful significance due to the high potential consequences involved in terms of cost, risk, process and personnel safety, environment, and reputation. This field has a wide circle, beginning from manufacturing, suppliers, and service providers, followed by organizations that provide training and qualification, and all this ends with delivering and providing inspection services to the end user. The North Africa and Mediterranean region are considered one of the most important destinations for investments and has a wide market and a suitable environment for expansion and work in this field in a large and fruitful manner. Based on this vision, the ndtcorner.com platform was built, specializes in the field of NDT. A place to come together to share insights, and concepts, and collaborate to drive progress in NDT, Welding Technologies, and Corrosion. Global manufacturers, Regional and Local suppliers in addition to Service providers, all of them come together in one place to deliver the latest solutions.



WELDING
Spotlight on Welding Technology. Technological development has become linked to everything, as welding technology has developed significantly. Global manufacturers, regional and local suppliers in addition to Service providers, all of them come together in one place to deliver the latest solutions. Experience the power of diversity and expertise at NDTX and get updates on the latest Welding Technology.



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لذا أصبح من أفضل الحلول المثالية هو التسويق الرقمي : حيث يضمن لكم الحصول على عائد استثمار عالي ومضمون ، لأنه الوسيلة الأفضل لجذب العملاء بكل سهولة وتحقيق الأرباح .

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19 – 21 February 2024

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09 – 13 July 2024

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2024

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PETROCHEMICAL & REFINING
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World Petrochemical Conference
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2024

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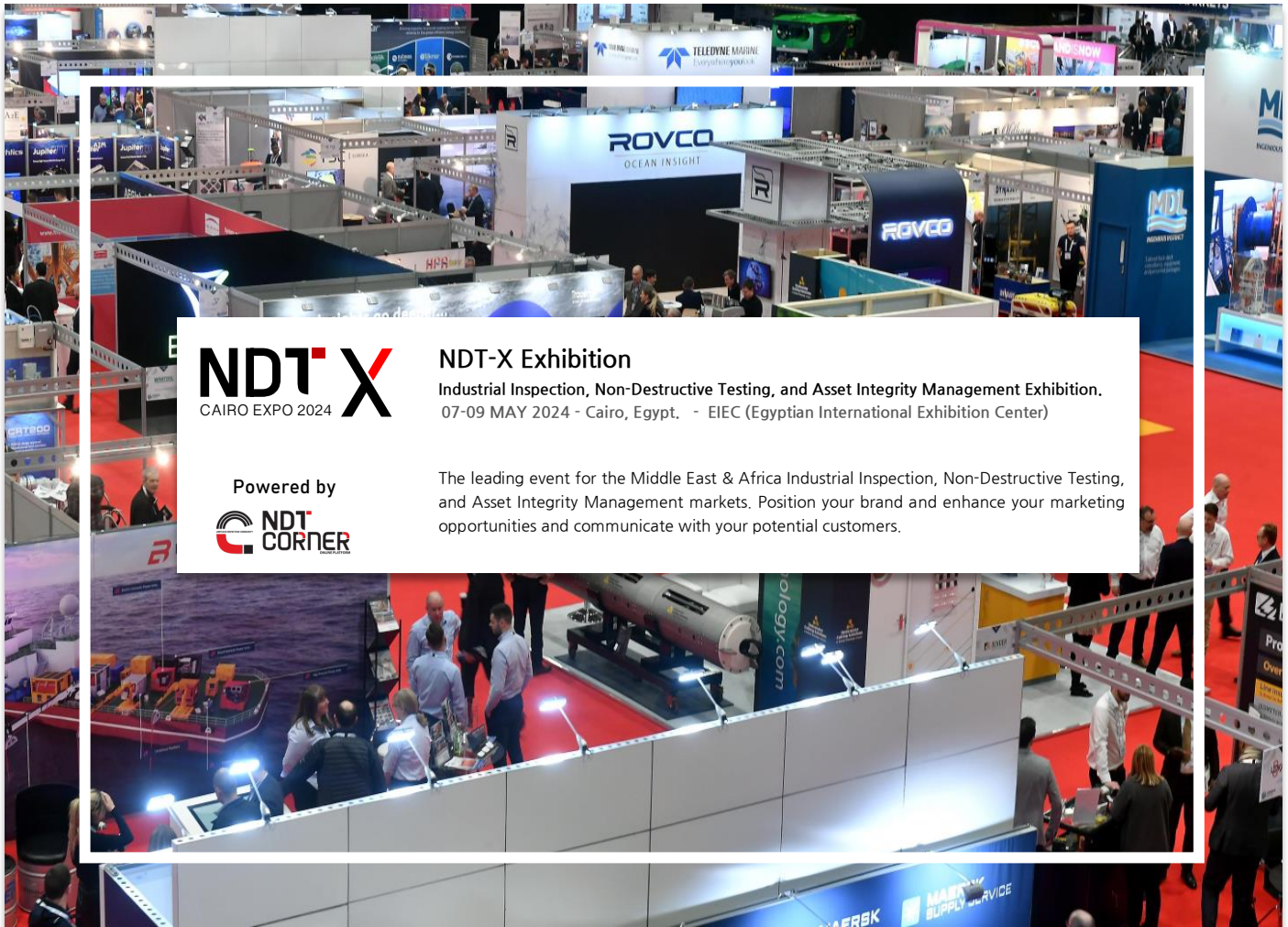


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