

BATEN RABAH
Consultation, Training,
Contracting &
Evaluation Training
Programme

Profil de la société

Nos clients

FORMATION

Conseil en Ingénierie

Matériel et essais

Contactez-nous



Profil de la société

Qui sommes-nous

Elle fait partie des entreprises œuvrant dans les domaines de l'inspection technique, des services industriels et de la formation. Et il a un précédent Entreprise avec les plus grands secteurs industriels et pétroliers en Algérie. Nous nous efforçons toujours de fournir les meilleurs services aux meilleurs prix Sans préjudice de la qualité du travail par des travailleurs hautement qualifiés et scientifiquement qualifiés pour effectuer des tâches spéciales dans la société.

Notre objectif

Créer une communauté d'ingénieurs en Algérie dont le premier objectif est d'atteindre la qualité grâce à une équipe scientifiquement qualifiée pour appliquer les codes et les standards

La mondialisation et le développement d'un ingénieur algérien pour suivre le rythme de la compétence mondiale, à travers la qualification et le suivi pour passer des certificats internationaux, qui sont rares en Algérie et sont fortement demandés sur le marché

Vision

Créer une communauté d'ingénieurs respectant les normes internationales avec des compétences algériennes et atteindre la suffisance en ingénierie et faire de l'Algérie un pôle important dans le domaine de la formation et de la qualification pour les certificats internationaux



Nos clients

Nos clients



Nos activités



FOTMATION



-1 cours de l'American Society for Non-Destructive Testing (ASNT) Inclure les cours : VT -PT -MT -RT -UT -PAUT -ET -MFL -LT
Premier, deuxième et troisième niveau



-2 Cours de l'American Petroleum Institute (API) Inclure les cours
API 510 – API 570 – API 571 – API 571 – API 577 – API 580 API
635 – API 1169



-3 Cours de l'Association américaine de soudage AWS Inclure les cours
WELDING TECHNOLOGY - CERTIFIED WELDER (CW) - Certified
Welding Inspector (CWI) - CERTIFIED WELDING EDUCATOR
(CWE) - Senior Welding inspector



-4 Cours de l'Association internationale des entrepreneurs en forage (IADC) Inclure
les cours
Rig inspection - Drilling Industry Training (DIT) - IADC Well Sharp



-5 Cours de génie des matériaux
METALLURGY FOR NON METALLURGIST - MATERIALS SELECTION
- BASICS OF CORROSION & CATHODIC PROTECTION



-6 Cours de l'association américaine d'ingénierie
SEC. II : MATERIALS - V : NDT - SEC. IX : Welding, Brazing - SEC.
VIII : Rules for Construction of Pressure Vessels - SEC. B31.1 :POWER PIPING -
SEC. B31.3 : PROCESS PIPING - SEC. B16.5 : PIPE
FLANGES & FLANGED FITTINGS



-7 cours de mécanique
Vibration - ANSYS - Inventor



-8 Cours de surveillance des équipements de levage
Forklift inspection Course - Crane - Entrance Course Preparation
operators-Rigging & Slings Course



-9 Cours de formation pour étudiants universitaires
- CASTING - CONTROL -QUALITY
NDT - WELDING



Consultant



Travailler en tant que consultant -1



Travaux de soudure et de contrôle -2



Corrosion et étude de la cause de l'effondrement -3



vent des Equipment de mesure -4



inspection des Equipment de levage et



accompagnement -6



calcule de conception des chaudière et des Equipment sous pression -7



HOT TAPPING -8

EQUIPMENT



INSPECTION EQUIPMENT

Classic NDT Equipment



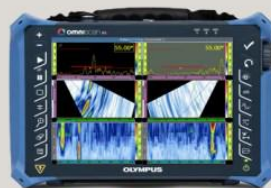
COATING THICKNESS



THICKNESS GAGUE



Ultrasonic flow detector



PHASED ARRAY



BHA COIL -11 INCH



Permanent YOKES



ELECTRICAL YOKE



Guess Meter



Pie Shape



BLACK LIGHT



BORESCOPE



VISUAL TOOLS



PMI



Vacuum Box



Hardness Tester



Infrared thermometer

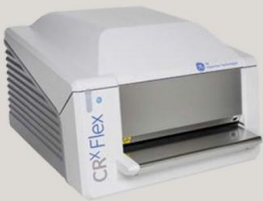


X-Ray Machine

KIT Qualified Operators



Advanced NDT Equipment



Computed Radiography



Acoustic Eye



Robotic Inspection



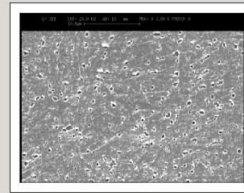
LRUT GUL G4



Remote Visual Inspection



GPR
Ground Penetrating Rader



Replica Test



Tubing Inspection



UCL
Hardness test using ultra sonic



SRUT



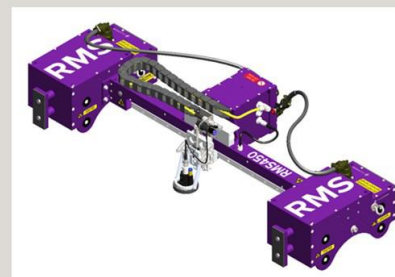
MFL



PEC



AET



RMS

Inspection & Survey



Baten Rabeh Company look to earned the confidence of oil & gas companies by consistently providing high quality inspection services and personnel supported by a company-wide commitment to industry best practices. All our inspectors are trained and assessed according to our Competency Management System, which incorporates internationally recognised schemes such as , ASNT API, CSWIP and LEEA.

Conventional NDT Services

- Eddy Current Inspection (ECI).
- Magnetic Particle Inspection (MPI).
- Dye Penetrant Inspection (DPI).
- Ultrasonic Thickness Gauging (UTG).
- Ultrasonic Flaw Inspection (UT Flaw).
- Infrared Thermography Testing (IRT).

Dropped Objects Survey

- Surveys conducted on drilling rigs, FPSO's, FSO's, CPF's, platforms etc.
- Independent surveys, corrective work and consultancy.
- Online database and management system.
- Training for rig crew, supervisors and operators.

Derrick Inspections (Cat III and IV)

- Structural inspections in accordance with API RP 4G Category III and IV.
- Bolt inspections, torquing and management programmes.
- Derrick, guide-track and equipment alignment surveys.
- Conditional surveys.

Lifting Gear Inspection

- Load testing and NDT.
- Thorough examinations.
- Multi-disciplined teams allowing multiple work scopes to be performed on one mobilization.

Drilling and Hoisting Equipment Inspection

Baten Rabeh Company conducts Category III and IV inspections on all drilling and hoisting equipment in accordance with API RP 7L and 8B. Inspections include MPI, visual inspections and dimensional checks. Baten Rabeh Company also offer 5 yearly inspections and overhauls on crown and travelling blocks, this includes bearing replacements, category IV inspections and issuance of a COC.

Pipework and Pressure Vessel Inspection

- Inspection and recertification of pipework and pressure vessels.
- Thickness gauging and NDT.
- Applicable to standards including API 510, 570, NR 13, ASME B31.3.
- Isometric drawings of pipes, vessels and pressure systems.

Risk Based Inspection implementation

- Data Collection
- Damage Mechanisms Review - Identify damage mechanisms, rates, locations, failure modes
- Risk Assessment
- Inspection Planning - Develop an inspection plan that includes
- Mitigation
- Reassessment - Update risk and inspection plans based upon inspection/mitigation results

Pressure Relief Valve (PRV) / Critical Gauge Testing and Certification

Using mobile workshop containers, testing and certification of pressure relief valves is conducted onsite with Baten Rabeh Company master gauges, fittings and pressure generators.

- +/- 0.1% Accuracy.
- PRV testing up to 15,000 psi.
- Gauge testing up to 36,000 psi.
- Individual tagging.
- Onsite repair and maintenance.
- Testing and certification in accordance to ASME, ISO, IEC, and API.

Rig Inspection (Rig Audit)

Baten Rabeh Company auditing services include highly experienced project supervisors which are competent in pre hire surveys, full system inspections/audits and condition surveys, helping clients to ensure that they make the right choice when hiring rigs and highlight possible defects that could lead to costly downtime.

Areas of inspection include:

- Drilling equipment.
- Electrical generation and distribution systems.
- Crane and hoisting systems.
- Subsea and well control.
- Marine and safety equipment.



Advanced UT

ABI SCAN

A & B Scan Enhancement Imaging

- Real-time Inspection of difficult access areas.
- Complicated geometries.
(flange welds, bearings, rail boogies etc.)
- Graphical record for the inspection report.
- Recovery of the single shot and dynamically changing A-Scans along the scanning path.
- Amplitude filtering with suppressing of the B-Scan-Enhanced segments corresponding to the echo amplitudes below the variable threshold level.
- Determining of the defects coordinates and projection sizes.
- Detecting the defects which are well below DAC curve.

Corrosion Mapping

Straight beam inspection with 3D data presentation (B-, C-, and D-Scan) is performed through continuous measuring and recording of echo amplitudes and reflectors coordinates during XY scanning.

Corrosion mapping is used on parent materials of vessels, pipes, storage tanks and other structures. This is especially useful for corrosion monitoring of large structures or key areas for any pitting, general corrosion, or severe corrosion.

Each scan is represented by pixels of a colour scale that corresponds to the thickness measured. It can be viewed from top(C-scan), side(B-scan), and end angles(D-scan) to provide a comprehensive visualisation of the component's condition.

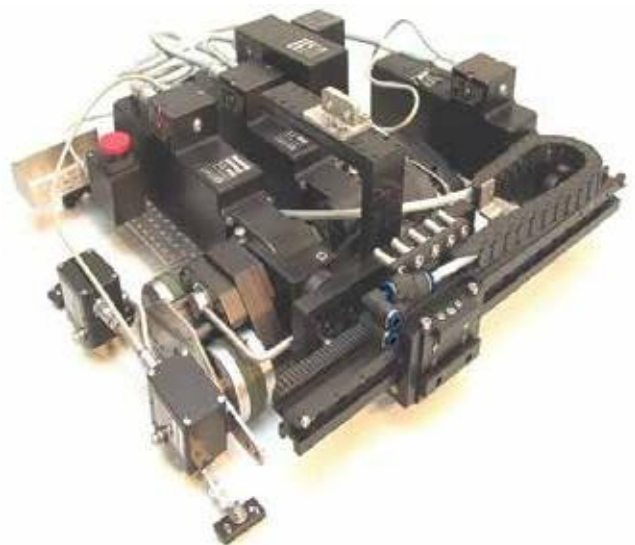
A-scans can also be recorded and exported to other user friendly programs such as Microsoft Office, to plot a three dimensional view of the scanned area.

Baten Rabeh Company provide both automated and manual corrosion mapping using the PSP-4 Force Technology system (T-Scan) and Sonotron ISONIC 2006 system (C-Scan).

AUT

Automated Ultrasonic Testing

- Uses FORCE PSP - 4.
- Weld inspection/corrosion mapping on pipes, vessels, and tanks.
- Four different type of inspection in one unit.
 - P-scan for weld inspection.
 - T-scan for corrosion mapping.
 - TOFD for detection and sizing.
 - LORUS for corrosion detection.
- Full A-scan recording for offline processing.
- Continuous water as couplant.
- Optimizes your inspection speed.
- Reliable, repeatable and accurate results.
- Gives a 3D view of the inspected/mapped area.
- Minimizes costly internal entry.
- Minimizes unnecessary repairs.
- Reduces or eliminates downtime.
- Potentially reduces outage/turnaround schedules.
- On-Line inspection provides data for advanced planning.
- Accepted by regulatory and industry standards and specifications.
- Supports RBI, FFS and remaining life programs.



TOFD

Time of Flight Diffraction-In service inspection of welds

Baten Rabeh Company TOFD is a UT technique that relies on detection of diffracted waves to find defects. The system operates in a pitch & catch configuration using a transmitting probe and a receiving probe. It is well suited for the rapid inspection of girth welds on pipes and vessels and provides real time data. Our ToFD is a preferred inspection method in the search for preferential weld root erosion and corrosion. When the beam comes in contact with the tip of a flaw or a crack, diffracted energy is cast in all directions. Measuring the time of flight of the diffracted beams enables accurate and reliable flaw detection and sizing even if the crack is off-oriented to the initial beam direction.



KEY FEATURES

- UT technique to inspect girth welds.
- Relies on detection of diffracted waves to find defects.
- Defect sizing - height and length.
- Weld thickness from 6mm up to 350mm.
- Pipe diameter from up to 75mm OD.
- Surface temperatures up to 450°C.
- Equipment battery power of 110V-240V AC.
- A single pass for the required inspection coverage.
- Automated Ultrasonic Inspection (PSP-4 Force).
- Manual Ultrasonic Inspection system (ISONIC).

APPLICATIONS

- New weldments to record a repeatable base line image.
- In-service weldments for erosion loss at the root zone.
- In-service weldments on high temperature surfaces.
- In-service Weldments for preferential corrosion loss at the root and heat affected zone (HAZ).
- In-service weldments for original build quality assessment prior to change in operating conditions of the equipment.
- In-service weldments and material for fatigue or service related cracking problems.
- New construction HDPE fusion weld inspection.

BENEFITS

- Less dependent on probe position and defect orientation than pulse echo techniques.
- Comprehensive coverage by the wide beam.
- Accurate determination of defect height and length.
- High Probability of Detection(POD).
- Inspection results are immediately available as a permanent record of the inspection.
- ToFD fingerprinting, applied during construction, may reduce future in-service inspection costs.
- Can be used on plastics like HDPE materials.

LIMITATIONS

- Small near surface defects may not be detectable due to lateral wave (dead zone).
- Harder to apply to complex geometries.
- May need to be applied in conjunction with pulse-echo scans.
- Cannot always be used on high grain size, anisotropic material structure such as Stainless and Duplex steel welds (to be investigated on a case-by-case basis).

OPERATING PRINCIPLE

With TOFD scans, the transmitting and receiving probes are positioned equidistantly from the weld centre and scanned parallel with the weld.

During operation, ultrasound is transmitted at an angle into the weld by one probe. If the sound is obstructed by a defect, some of the energy is diffracted at its edges and detected by the receiving probe. The signals are recorded, processed with specialized software for interpretation and sizing of indications.

By varying the transducer type, size, frequency, separation and number of scans the operator can "best fit" the system to the application.

Phased Array UT

Weld Inspection and Crack Detection

The Baten Rabeh Company Phased Array Ultrasonic Technique (PAUT) concept for defect measurement during weld inspections represents a significant step forward over conventional technologies. Phased Array technology involves the use of multiple ultrasonic elements and the application of electronic time delays to the individual elements. Ideal for a wide range of weld inspection applications, phased array technology enables the highest levels of defect detection and at the same time minimizes the time needed for inspections.



KEY FEATURES

- Wall thickness from 6mm onwards.
- Pipe diameter from 21mm onwards.
- Accuracy $\pm 0.2\text{mm}$ in gauging mode.
- High levels of repeatability.
- Ultrasonic transducer from 16 to 64.
- Test frequencies 2.25MHz, 5MHz, and 10MHz.
- Multiple-angle inspection
- A single, small, multi-element probe and wedge
- Operating temperatures up to 200°C .
- Operation of up to 8 hours with a single battery.
- 3.5kg operating weight with batteries and probe.
- Ideal for scanning large areas of weld.

APPLICATIONS

- Piping weld inspection.
- Inspection of complex geometries.
- Corrosion mapping.
- Inspection of nozzle welds.
- Turbine component inspection.
- Detection of stress corrosion cracking.
- Flange sealing face inspections.
- Shaft and axle inspections.
- Pressure vessel weld inspection.

BENEFITS

- No safety hazards & no radiation requirement.
- Minimize re-verification of discontinuity costs.
- Small footprint of the transducer.
- Use multiple elements to steer, focus and scan beams with a single transducer assembly.
- Electronic focusing - optimize beam shape and size at defect location, probability of detection.
- Multiple angles from a single probe - increases the probability of detection of anomalies.
- Ability to focus at multiple depths - improve the ability for sizing critical defects for volumetric inspections.
- Improved defect detection and sizing.
- A wide range of inspection parameters.
- Compliant with all known codes.
- Rapid component coverage.
- Beam forming and beam steering capabilities.
- Sectorial scanning.
- Real time inspection.

OPERATING PRINCIPLE

The ultrasonic test data will be based on time and amplitude information derived from processed RF waveforms. These waveforms and the information extracted from them will commonly be presented in one or more of four formats: A-scans, B-scans, C-scans, or S-scans.

COBRA SCANNER

Phased Array Inspection on Small-diameter Pipes

KEY FEATURES

- Inspect pipes in limited access areas.
- Uses low profile wedges
- Covers standard pipes from 0.84" to 4.5 " OD.
- Operates within 0.5" clearance.
- Can hold 2 phased array probes for complete weld coverage in one pass.
- Can be configured to make one-sided inspections for pipe-to-component inspection
- Minimum space for one sided scanning is 50 mm.
- Can be manipulated from one side of a pipe.
- Spring loaded scanner can be used on ferromagnetic and non-ferromagnetic materials.

TEMP MASTER

High Temperature Phased Array Inspection

KEY FEATURES

- Heat resistant material engineered.
- Temperatures up to 350°C (662°F).
- Increased inspection angle range and sizing accuracy to the full capability of the phased array probe.
- Multiple wedge sizes available for various wall thickness.
- Cooling systems prevent damage to the scanner, wedge and probe.
- No shut down required.
- Encoded manual scanning for consistency and repeatability.
- Automated scanning limits direct contact with parts at elevated temperatures

FLANGE SCANNER

Phased Array Inspection on Raised Face Flanges

KEY FEATURES

- Flange size from Class 150 to 2500.
- Flange thickness from 0.88" to 8".
- Pipe nominal size from 6" to 24".
- Small probe suitable for all flanges down to 3/4".
- Temperature up to 100°C.
- Phased Array UT technology accurately acquires scan data from a single revolution of the flange.

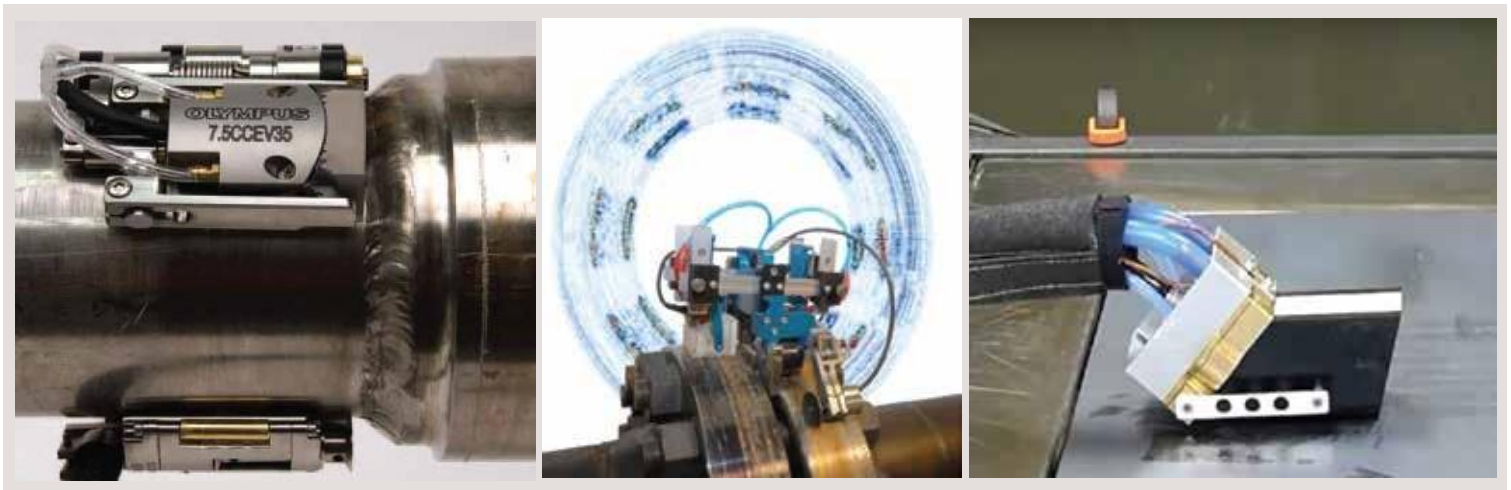
BENEFITS

- Flanges can be inspected without disassembly.
- In-service scanning capability saves time and money.
- Both sides of the flange are typically inspected at the same time.
- Encoded scanner allows for accurate repeatable inspections for monitoring known defects.
- Repeatable and consistent results.
- The data is permanently recorded to allow audit or future damage monitoring.
- Can perform online inspections with no need to stop production.

OPERATING PRINCIPLE

With phased array ultrasonic technology (PAUT), the tester manipulates multi-element probes to modify beam properties such as angle, standoff distance and focus.

To inspect the raised flange face area, encoded magnetic scanners direct sound from the OD of the flange between the bolt holes. With PAUT one can engineer the ultrasound angles to fit the specific flange geometry. Also, the multiple ultrasound angles can be used to optimize data displays of corrosion and/or erosion in flanges.



Insulated Components Testing

Baten Rabeh Company ISULATED Component testing is the fast, accurate and reliable way of surveying ferrous pipes and vessels through their insulation. In operation, it does not disturb insulation or coatings and provides accurate results through aluminium, stainless or galvanized steel claddings. With INCOTEST, insulation may be hot or cold, wet, rough, encrusted, irregular, heterogeneous or even with wire mesh. Through its excellent repeatability, the INCOTEST is ideally suited for baseline and periodic monitoring survey.



KEY FEATURES

- Measurement through insulation, concrete, marine growth and fouling.
- Based on pulsed eddy current principle.
- Wall thickness from 6mm up to 65mm.
- Insulation thickness up to 200mm.
- Pipe diameter from 50mm up to 300mm.
- Accuracy $\pm 5\%$.
- High levels of repeatability $\pm 2\%$.
- Operating temperatures from -150°C to 500°C .
- Survey capability of up to 1,000 points per day.
- Operation of up to 8 hours with a single battery.
- The system transducer can be located up to 100m (328ft) from the base unit.
- Compute thickness reading within 2 to 40 seconds.
- Ideal for scanning large areas.

APPLICATIONS

- Offshore and onshore installations.
- Tank shells.
- Large vessels.
- Sphere legs.
- Corrosion Under Insulation (CUI) inspection.
- Insulated and coated objects.
- Object protected by concrete/fireproofing.
- Object covered with marine growth or fouling.

BENEFITS

- INCOTEST enables the detection of CUI (Corrosion Under Insulation) and FAC (Flow Accelerated Corrosion).
- Same performance above and underwater.
- In service and on-stream inspection.
- No direct surface contact.
- No specific surface preparation.
- Mitigate removal of insulation.
- High costs for removal of insulation can be avoided.
- Continuous scanning with minimal equipment set-up.
- Data digitally stored.
- An instant site report in a measuring matrix format.
- Scaffolding can be reduced by using rope access or by mounting the measuring sensor on an extension pole.
- Operation is possible across a wide range of climatic conditions with consistently high levels of repeatability.
- Application development in co-operation with clients.

OPERATING PRINCIPLE

Baten Rabeh Company INCOTEST monitors the decay of an eddy current pulse within a steel wall, computing the average metal thickness by comparing the resulting signal features with similar calibration tests (echo) of the resulting measurement can be influenced by a number of factors like metallurgy variations (magnetic and electrical properties) and temperature.

LRUT

Long Range Guided Wave Ultrasonic Testing for Pipelines

Baten Rabeh Company LRUT is for detecting corrosion and metal loss in pipe work. It is a pulse-echo system, aimed at testing large volumes of material from a single test point. The collar clamped around the pipe produces a 360° sound wave moving axially down the pipe using the pipe itself to guide the wave.

Baten Rabeh Company LRUT is primarily a screening tool and does not provide a direct measurement of pipe wall thickness. The technique is sensitive to a combination of the depth and circumferential extent of any metal loss on both the outside and inside surfaces of the pipe. A signal response is produced where the cross-section is reduced or changes character at a weld or other pipe feature.



KEY FEATURES

- UT technique to inspect.
- Detection of internal or external metal loss, corrosion and erosion under insulation of pipes.
- Pipe diameters from 3" to 48".
- Typical length ±30m per direction.
- Operating temperature up to 100°C.
- Metal loss down to 3% of pipe Cross Sectional Area.
- Detection of 9% Cross Sectional Area metal loss flaws.
- Discrimination between flaws and pipe features; welds, bends, supports, etc..
- Longitudinal accuracy is better than 100mm.
- Rotation 8 times around pipe.
- 360° sound wave.

APPLICATIONS

- Road and river crossings.
- Power plant tubing.
- Offshore risers.
- Offshore topsides pipe work.
- Jetty lines.
- Refinery pipe work.
- Chemical plant pipe work.
- Tank farm link lines.
- Pipe bridges.
- Spiral welded pipe.
- Nuclear boiler spines.

BENEFITS

- Rapid screening for in-service degradation.
- Avoidance of total removal /reinstatement of insulation or coating, except at location of transducer tool.
- Ability to inspect inaccessible areas.
- Reduction in costs of gaining access.
- 100% coverage in test range.
- Multi defect focus capability -Longitudinal, torsional and flexural wave modes on one tool without transducer change.

OPERATING PRINCIPLE

LRUT employs low frequency guided waves, operating just above audible frequencies, propagated from a ring of transducers fixed around the pipe. These low frequencies (in ultrasonic terms) are necessary to enable appropriate wave modes to be generated.

A satisfactory ultrasonic coupling being achieved with mechanical or pneumatic pressure applied to back of the transducers to maintain contact with pipe surface.

Wherever the wave encounters a change in pipe wall thickness, a proportion of energy is reflected back to the transducers, thereby providing a mechanism for detection of discontinuities.

EMA & ACFM

Surface and near surface flaw detection and sizing

Baten Rabeh Company provides surface Eddy Current testing for surface and sub-surface crack detection for structural and material integrity assessments using state of the art Eddy Current method such as Electro Magnetic Array (EMA) and Alternate Current Field Measurement (ACFM). The Lizard® M8 System and Mentor EM Eddy Current System provides highly accurate, repeatable and uncompromising performances for detecting and sizing surface and sub-surface breaking in metals. These systems deploy non contacting Eddy Current probe with very minimal cleaning requirements saving time and cost.



KEY FEATURES

- Eddy Current technique to inspect.
- Defect sizing – Length & Depth measurements.
- Coating thickness up to 2 - 3mm.
- EMA / AC Field Measurement / ET modes.
- No coating removal (Lift-off).
- Uses Lizard M8 and Mentor EM system.

Work scope includes :

- Detection of metal surface and sub-surface breaking.
- Corrosion and material thickness measurements.
- Sorting and identification of materials.
- Coating thickness measurements.
- Electrical conductivity measurements.

APPLICATIONS

Oil & Gas Industry

Inspections of nodal joints for surface and sub surface breaking, pedestal crane, pad eye, flare booms, telecom tower, sheer panel and module welds.

Marine Industry

Marine diesel tank corrosion monitoring, hull surveys etc.

Rail Industry

Wheels, rails, rolling stock etc.

BENEFITS

- Applied on all electrically conducting material.
- Selectable filters for scan noise reduction.
- Post processing/ Off-line analysis 3D Plot.
- Capable of detecting surface and sub-surface breaking without the removal of surface.
- Quick to use and with the high inspection speeds.
- Inspection data retrieval for traceability.
- High durability and mobility with rigid, rugged, small, and light unit.
- Well trained inspectors and engineers for data collection and analysis.

OPERATING PRINCIPLE

Cracks cause a disruption in the circular flow patterns of the eddy currents and weaken their strength. This change in strength at the crack location can be detected.

SOFTWARE

Lizard M8 Sub Sea System

The common interface ensures all users can readily apply the Lizard® technology to a variety of applications without the requirement for additional software training. The Graphical User Interface (GUI) is deliberately designed to utilise graphical input by way of simple sliders for rapid data manipulation, with the option of hot keys for common tasks.

Mentor EM System

It redefines Eddy Current testing with its excellent signal to noise ratio and high resolution display that's easy to see in any light. It incorporates user designed application workflows, and onboard Wi-Fi capability so that inspectors of all levels can easily communicate with each other. Plus an off the shelf lithium ion battery with battery energy content of less than 100Wh, means you can easily transport the Mentor EM on aircraft and helicopter.

MFL

Magnetic Flux Leakage Method for Tank Floor Testing

Baten Rabeh Company provides Magnetic Flux Leakage Inspection (MFL) for the oil and gas, petrochemical and power industries. We use MFE FLOOR MAPPING which is the most reliable version of MFL corrosion detection, sizing & mapping floor scanner. The MFL technology is similar to Magnetic Particle Inspection (MPI) but without the ink or magnetic particle. The component is magnetised to a level at which the presence of a significant local reduction in material thickness causes sufficient distortion of the internal magnetic field to allow flux lines to break the test surface at the site of the discontinuity.



KEY FEATURES

- Latest generation of permanent magnets.
- Uses Neodymium Iron Boron magnet.
- Motorised guided wheel with speed control.
- Plate thickness up to 12.5mm (20mm in manual mode).
- Coating thickness up to 6mm.
- Maximum speed up to 450 mm/s.
- Data capture rate of every 1 mm.
- High sensitivity.

BENEFITS

- Covers large areas at fraction of time.
- Can be conducted without removal of coatings.
- Minimises speed variation.
- Accurate and reliable results.
- Post processing and offline analysis can be done.
- Time and cost efficient.
- Component evaluation at variable depths.
- Maximum coverage with minimum lift-off when riding through curved surface.
- Custom designed data acquisition software.

APPLICATIONS

- Oil & Gas industry for inspections on tank floors through protective coating.
- Ferrous materials such as carbon steel, nickel, monel.

SOFTWARE

Captured data is imported onto the desktop reporting software for further analysis; utilizing its computing power for visual representations of defects on a tank-wide or plate-by-plate basis. This helps with:

- Re-analysis of defects to identify profile type and re-size.
- Automatic generation of CAD drawing of tank floor.
- Adding appurtenances such as manways, pipes, sumps.
- Zoom function of whole floor or specific areas.
- Numbering system.
- Shows major defects per track.
- Shows selected levels of corrosion.
- Edits data at global / plate or individual defect level.
- Adds defects from other types of inspection into the Floormap report.
- Adds MFL data from annular inspection into Floormap report.
- Weld defect reporting function.
- Floormap data 2D display at 15 mm resolution.
- Statistics per plate or per tank.
- Report generator with comprehensive printing.

OPERATING PRINCIPLE

MFL technology is similar to Magnetic Particle Inspection (MPI) but without the ink or magnetic particle. The component is magnetised to a level at which the presence of a significant local reduction in material thickness causes sufficient distortion of the internal magnetic field to allow flux lines to break the test surface at the site of the discontinuity. With MFL, suitable sensors are used to give an electrical signal at the leakage site. This signal may operate an audible or visual alarm to alert the inspector or may store the event for computer mapping of the area.

MARK IV SPECIFICATIONS

GENERAL

Principle of operation	Magnetic Flux Leakage
Sensor Type	24 Coil Sensor, 12 channels. "Coil type is adequately sensitive & stable and durable"
Scanning Modes	Mapping, Manual (Free Scan) and Pause/Freeze on Defect Modes
Scan Width	300 mm / 12 Inches

SYSTEM SPECS.

Scanner Weight	30 kg / 65 lbs. Required only 1 person for Mobility & Handling
Method of propulsion	Free Push & Pull / Manual, wheel size (5in/127mm dia.)
Transit case	- Meets IATA Requirements for Transporting Magnetsable Material - 2 Hard Transportation Cases, Dimensions (1 st case (50x47x20 cm) & 2 nd case (45x40x20 cm))
Cables	3 Advanced US Military Spec Breakaway Cables
Handles	Detachable and Fully Adjustable Handle made from carbon fiber material
Power	- Hot Swappable Batteries - Reinsert fresh/charged batteries with no scanner switch off. - Li-Ion smart battery (11.4V, 2160mAh) Dim. (160 x 77 x 7 mm) / 50 gm - 4 batteries supplied - 8 hrs. of continuous use, charging time 0.30 min/work time 2 hrs.
Sensor Height Control	Flexibility setting (Up and Down) depends on Floor Status - 6 levels setting
Maximum Single Scan Length	Unlimited length
Scanner Height	Adjustable handle down to 28" inches / 71 cm.
Speed Tracker / Scanner Speed	Yes, Variable Up to 3.3 ft. - 1.1 m/sec.

SCANNER CAPABILITIES

Thickness Range	- Standard Plate Thickness Range: 4 mm - 14 mm - Free scan/Manual Range: 4 mm - 14 mm & Mapping Range: 6 mm - 12.7 mm - Optional from 0.50" to 0.75" / (12.7 mm - 20 mm) "High Flux Bridge Upgrade"
Positional Accuracy	+/- 5 mm.
Minimum defect detection sensitivity	20% wall loss as 1.25 mm depth @ (¼") 6 mm Plate Thickness
Origin of defect detection	Bottom and Top side
Test through Coatings	Yes, if non-magnetic
Coating/Lining Thickness	Up to 50" / 12.7 mm.
Minimum man-way size	450 mm / 17.5 in
Temperature	Operating temperature - 21°C to 60°C (-5.8° F to 140° F) Storage temperature limits - 51.1°C to 71°C (-60° F to 160° F)

SOFTWARE & ON-BOARD COMPUTER

Onboard touch screen Computer Getac F110 (Industrial)	- Tight casing (IP65) - Resistant to 1.8 drop, Shocks, Vibration, dust and liquid (MIL-STD-810G) - Capacitive touch screen/digitizer option & Works with gloves - Double Hot swappable Batteries and it powers the whole MARK-4 scanner
Supported plate types	Rectangle, annular and sketch
Un-scanned area	20 mm (3/8") from plate weld, Corner 119x119 mm (4.7x4.7") dead zone
Real Time Display	Yes, Speed tracker, freeze on defect
A and C Scan View	Yes, A and C scan view, Plate guidance, zoom, X & Y Position
Alarm on defect	Yes, Adjustable Threshold - Screen Freeze Alarm
Defects Location	Yes, Operator is able to locate defects without the use of a map
Sensitivity setting	Yes, (Min - Max) adjustable
Report file extension Type	Word file - Editable Format. add photos, comments ...etc.
CAD Tank Drawing Software	Yes, Automatically generated
Time for Floor layout drawing	Creation of floor layout drawing before start scanning in a minute

Remote Visual Inspection

Baten Rabeh Company have a large variety of Ex certified camera systems for environment Zone 1 and the latest pan and rotate Ex push rod camera. Our systems have the latest technology; i.e. automatic focus, auto upright camera, waterproof up to 11 bar, operating through 45° and 90° bends. Baten Rabeh Company can provide several systems to cover all access points and pipe diameters/lengths with the best possible images. We also have systems that are waterproof and perfect for caisson inspection before and after cleaning and a high powered zoom camera for the inspection of tanks (sphere), vessels, reactors etc.

KEY FEATURES

Small Combi Pushrod



- Pipes from 19 mm to 150 mm.
- 30m (98 ft) of 4.5 mm semi rigid rod.
- 32 mm and 23 mm interchangeable CCD camera heads.
- Capable to negotiate multiple 90° bends.
- Horizontal / vertical pipe sections.
- Cameras waterproof to 2 bar.

Medium Pushrod Ex



With EX PAN & ROTATE CAMERA

- Pipes 100 mm upwards.
- EEX approved – II 2G Ex px II B T4.
- Pan and rotate camera head.
- Centraliser as an addition.
- 40 m pushrod.

With separate Axial viewing camera of 41 mm (non Ex)

- Pipes diameter 50 mm upwards.
- 30 m pushrod.

Large Pushrod Ex



- Pipes diameter from 80 mm to 600mm.
- 150 meters of semi rigid rod.
- Capable to negotiate multiple 90° bends.
- Horizontal / vertical pipe sections.
- Camera waterproof to 11 bar.
- Explosion proof; EExd.
- Zone 1 Group IIB T3.

EEX Tractor systems



- Pipes 150 mm upwards.
- With ancillary light for larger pipelines up to 2000 mm.
- EEX approved – tractor and cameras are pressurised with nitrogen.
- Built in alarm when pressure drops.
- Steerable tractor.
- Automatic upright picture control.

Tank Zoom Camera



- Suitable for reactors, vessels, sphere tanks.
- Camera with 25x optical & 12x digital zoom for a total of 330x.
- 360° Pan and 234° tilt.
- 2 x 35 W lamps and Turbo Lamp mode of 80 W total.
- Laser measurement.

APPLICATIONS

Onshore

Boiler tubes, steam piping, turbine shafts, pressure vessels, ducting, pipelines, deep waterwells, heat exchangers, condensers.

Offshore

Internal/external inspection of risers, caissons, tubular structures, hulls, hoses, process equipment, flare stacks, piping.

Work scope includes :

- Cleanliness verification.
- Weld verification.
- Foot prints.
- Problem solving.
- Condition monitoring.
- Foreign object search.

BENEFITS

- Reduces confined space entry.
- Reduces operational and safety risk.
- Reduces/eliminates equipment disassembly.

OPERATING PRINCIPLE

Combining a camera system with an NDT technique provides solutions to many difficult inspection problems.

Remote operated vehicles can position an inspection tool via suitable camera/lighting systems. This enables monitoring of the tool's position and performance and ensures that the equipment passes obstructions. The cameras also collect information on corrosion, cracking, wear, coating condition, process build-up, and marine growth.

This information, when combined with radiography, ultrasonics, eddy current, magnetic particle and magnetic flux tests, provides a detailed and comprehensive assessment of a component's condition.

Tube Inspection

ECT, ECA, NFT, RFT, IRIS

Baten Rabeh Company provides tube inspection using Eddy Current Testing (ECT), Eddy Current Array (ECA), Near Field Testing (NFT), Remote Field Testing (RFT), and Internal Rotary Inspection System (IRIS). ECT is capable of detecting internal and external pitting, erosion, certain types of cracks, baffle wear, holes, and mechanical damage. NFT is suited to the detection of internal corrosion, erosion or pitting on the inside of carbon steel tubing. RFT is ideally used to inspect ferromagnetic tubes such as carbon steel and ferritic stainless steel. IRIS offers a wide range of detectable discontinuities such as internal, external erosion, baffle wear, pitting, corrosion and wear.



KEY FEATURES

Eddy Current Tube Testing (ECT)

- About 750 tubes inspected per 12 hour shift.
- Ideally suited to the inspection of thin walled tubing as found in evaporators and condensers.
- Capable of detecting generalised and localised wastage, both internal and external.
- A range of 11mm to 68mm ID can be inspected.
- Permanent record of results.

Remote Field Testing (RFT)

- About 400 tubes inspected per 12 hour shift.
- Ideally suited to the inspection of boiler tubing with flexible probes for negotiating bends.
- Capable of detecting generalised and localised wastage, both internal and external.
- A range of 10mm to 100mm ID can be inspected.
- Permanent record of results.
- Good sensitivity to detect volumetric material loss.
- Typical discontinuities detected with RFT are erosion, corrosion, wear and large volume of pits.
- Through holes are also detectable.
- Utilize multi frequencies.

Near Field Tube Testing (NFT)

- Predominantly used for finned ferromagnetic tubes.
- Suitable for the detection of internal corrosion, erosion, or pitting on the inside of carbon steel tubing with no effect from the external fins.
- Recommended as primary inspection of finned ferromagnetic tubes with IRIS back-up.

Internal Rotary Inspection (IRIS)

- Use ultrasonic transducer.
- Use in all types of metal tubing, ferrous and non-ferrous
- About 150 tubes inspected per 12 hour shift.
- Capable of detecting generalised and localised wastage, both internal and external.
- Highly accurate measurement.
- A range of 10.5mm to 50mm ID can be inspected.
- Permanent record of results.
- Capable to measure the remaining wall thickness.
- Back up other inspection techniques to support data.

APPLICATIONS

- Air conditioners.
- Heat exchangers.
- Main condensers.
- Fin/fan units.
- Caustic heaters.
- Hydrogen coolers.
- Lube oil coolers.
- Packaged boilers.
- Overhead condensers.
- Feedwater heaters.

Electrical



Baten Rabeh Company has full capability to provide our services in compliance with local competency requirements such as CompEx, EEHA and IECEx (CoPC) whilst working to the relevant international and regional industry standards and regulations. We have the benefit of being an approved CompEx, IECEx and EEHA training centre ensuring that our personnel are versed in the latest standards at all times. Certified teams provide rope access where required to minimize costs and time taken to complete projects as an added extra.



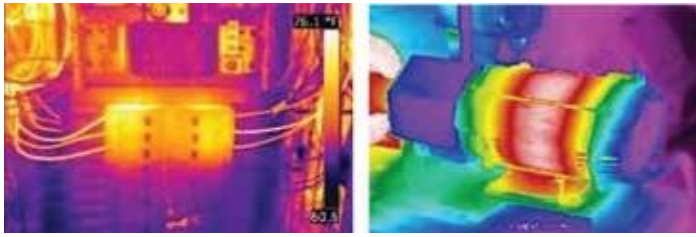
Hazardous Area Equipment Register (HAER)

Perform survey of electrical equipment in hazardous areas along with compilation of Ex dossiers and certifications ensuring compliance against relevant standards.

- Conducted by in-house experienced trade electricians certified in CompEx, IECEx (CoPC) and EEHA.
- Inspections completed in accordance with internationally recognized standards such as IEC, NR10, IEEE, NORSOK, and API.
- Full management of Ex Inspection projects throughout the lifecycle including engineering, material procurement, installation, inspection, maintenance and remedial work.
- Ability to work with all client recording and reporting systems including specific client Ex data base software and maintenance management systems such as SAP, Maximo etc.
- Supervision at project feed stage to ensure Ex compliance throughout the build of a new project and on-site follow up.
- Supply of materials and ability to carry out all remedial workscope.
- Optional RFID Tagging System working with Arnlea and SafeEx.
- Online database of equipment register and inspection.

Thermography & Partial Discharge Testing

Thermographic and partial discharge surveys of live equipment are carried out by qualified inspectors. Baten Rabeh Company is able to carry out full surveys using HVPD equipment along with conventional IRT technology making surveys inherently safer and more time/cost efficient.

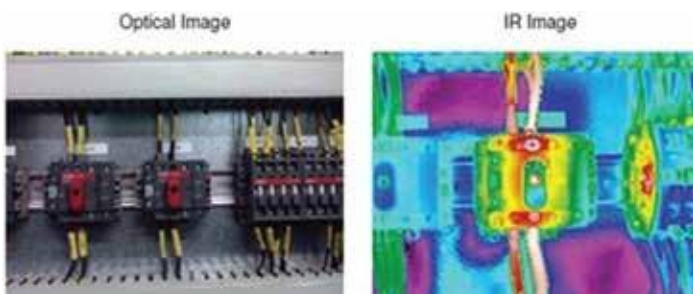


Surveys include:

- Cables and ancillaries.
- Motors and motor controls.
- Transformers.
- Distribution boards.
- Inspections in line with international standards.

Benefits are:

- Reduction in unplanned shutdowns.
- Efficient and fast method of screening for issues.
- Remote, non-contact technique improves safety and removes requirement for equipment downtime.
- Lower probability of catastrophic equipment failure.



Primary and Secondary Injection Testing

Function checks using certified electricians and test equipment to verify the operability of trip device, overcurrent module, protection device, OCR, ETU etc.

- Efficient method to verify protection settings and safety.
- Small and portable equipment utilised.
- Full report of settings and records of results.



Motor Inspection and Testing

Inspection and testing of motors and all ancillary components such as mechanical lubrication systems and purge units. Surveys include:

- Insulation resistance and continuity checks.
- Testing of motors against original design specification.
- Mechanical inspection of rotating parts.
- Ad-Hoc Vibration surveys using portable equipment.

Electrical Audit

Audit of electrical installations carried out by certified and qualified electrical auditor as per client's compliance requirements.

- Review of high level drawings.
- Assessment of ongoing inspection systems.
- 3rd party system audits such as FAT's
- Electrical testing of systems and equipment.
- Safety audit of electrical switchroom and installations.

Electrical Installation, Commissioning, Repair and Maintenance Scopes

Full capability for all aspects of an electrical project from equipment supply, through to end testing and maintenance along with project management and reporting.

Work scopes include:

- Heat tracing installation and repairs.
- Preventative, corrective and operational maintenance of electrical equipment in accordance with manufacturers' guidelines.
- Installation and commissioning of new electrical equipment.
- Fault finding and repair of existing equipment.
- Ancillary tasks such as cable tray installation, cable pulling, cable termination and subsequent testing.
- Upgrade of electrical systems.
- New build and upgrade projects.

Electrical Construction Supervision

Management and supervision of electrical system installation, testing and certification.

- New build and upgrade projects.
- Project planning and execution.
- Focus on on-time delivery
- Skilled and qualified personnel.



Training

Our training Partner is developed to strike a balance between theory and practice. This is underpinned by thorough skills and knowledge assessments conducted by qualified trainers to provide consistent and measurable outcomes.

• NDT COURSES

- American Society for Non-Destructive Testing (ASNT) course Include
- course: VT -PT -MT -RT -UT -PAUT -ET -MFL -LT
- level I II III

International Association of Drilling Contractors (IADC) Courses Include

- Rig inspection
- Drilling Industry Training (DIT)
- IADC Well Sharp.

American Petroleum Institute (API) Courses

- API 510 – API 570 – API 571 – API 571 – API 577 – API 580 API

American Welding Association AWS Courses

- WELDING TECHNOLOGY
- CERTIFIED WELDER (CW)
- CertifiedWelding Inspector (CWI)
- CERTIFIED WELDING EDUCATOR(CWE)
- Senior Welding inspector

Materials engineering course

- METALLURGY FOR NON METALLURGIST
- MATERIALS SELECTION
- BASICS OF CORROSION & CATHODIC PROTECTION

Drilling Industry Training Courses

- API 4G drilling structure inspection.
- Bolt installation for drilling structures.
- Dropped objects inspection for rig crew.

American Engineering Association Courses

- II: MATERIALS
- V: NDT - SEC
- IX: Welding, Brazing - SEC.
- VIII: Rules for Construction of Pressure Vessels - SEC. B31.1:POWER PIPING -
- B31.3: PIPING PROCESS - SEC. B16.5: PIPE
- FLANGES & FLANGED FITTINGS

mechanics course

- Vibration
- ANSYS
- Inventor

Lifting Equipment Monitoring Course

- Forklift inspection Course
- Crane
- Entrance Course Preparation
- operators-Rigging & Slings Course

Our experts

DR.SAMIR SAAD

Experience: 20 Years (Oil and Gas)

NDT III ID 190902 ALL METHODS

API 510 630 570 RBI ID 35376

Experience: 20 Years (Oil and Gas)

Skills & Expertise

Dr.Eng. Wael Hoziefa

Experience: 19 Years (Material & Oil and Gas)

Engineering Consultant in Materials and Metallurgy Engineering, Member of the American Society for Non-Destructive Testing (ASNT) ID 306394, Active Member of the Egyptian Plumbing Association

Dr MOHAMED NASR

Experience: 25 Years (Oil and Gas)

QA/QC Mechanical,

Welding, Painting, in-service, and NDT Inspections,

Certified senior welding inspector

Certified Piping Inspector

ASNT III ID 201448

Dr,BATEN RABAH

Experience: 10 Years (POWER PLANE & Oil and Gas)

electro mechanic doctor ;Asme authorized inspector & Member of the American Society for Non-Destructive Testing (ASNT) ID 330596



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