DES

DETECTION ENGINEERING SERVICES

DETECTION ENGINEERING SERVICES

PRECISION. SAFETY. EXCELLENCE.

INSPECTION SERVICES

CORROSION AND MATERIALS SERVICES

MECHANICAL INTEGRITY SERVICES

ENGINEERING AND CONSULTING

ONSHORE RIG AUDIT

OFFSHORE RIG AUDIT

RISK-BASED INSPECTION

ADVANCED NDT TECHNOLOGY

DES UNITED ARAB EMIRATES:

6th Floor ; Dar Al Salam Building, Liwa Street, Corniche, Abu Dhabi, U.A.E

Tel: +971 503 322 530

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ABOUT DEC

We are a group of highly experienced engineers with long experiences in inspection activities for Oil and Gas industry more than 20 years

Our Experiences at different countries such as Egypt ; Iraq ; Oman ; Kuwait ; Qatar.

Our team managed different projects with Major Oil and Gas Operators in MENA Region.

Our Team Qualified and Certified from Major certifying bodies for inspection activities such as API ; CSWIP ; ASNT ; AWS ; IADC

We provide the latest inspection technologies such as RMS ; MFL ; IRIS ; PAUT ; TOFD…

Detection Engineering Services

stands ready to be your trusted partner in safeguarding the integrity and reliability of your critical assets.

Based in UAE, we offer a comprehensive suite of inspection, Non-Destructive Testing (NDT), corrosion and materials, and mechanical integrity services; Rig inspection and Auditing.

Our dedicated team of experts is committed to providing you with precise and dependable solutions, ensuring operational excellence and safety.

We look forward to the opportunity to support your engineering needs.

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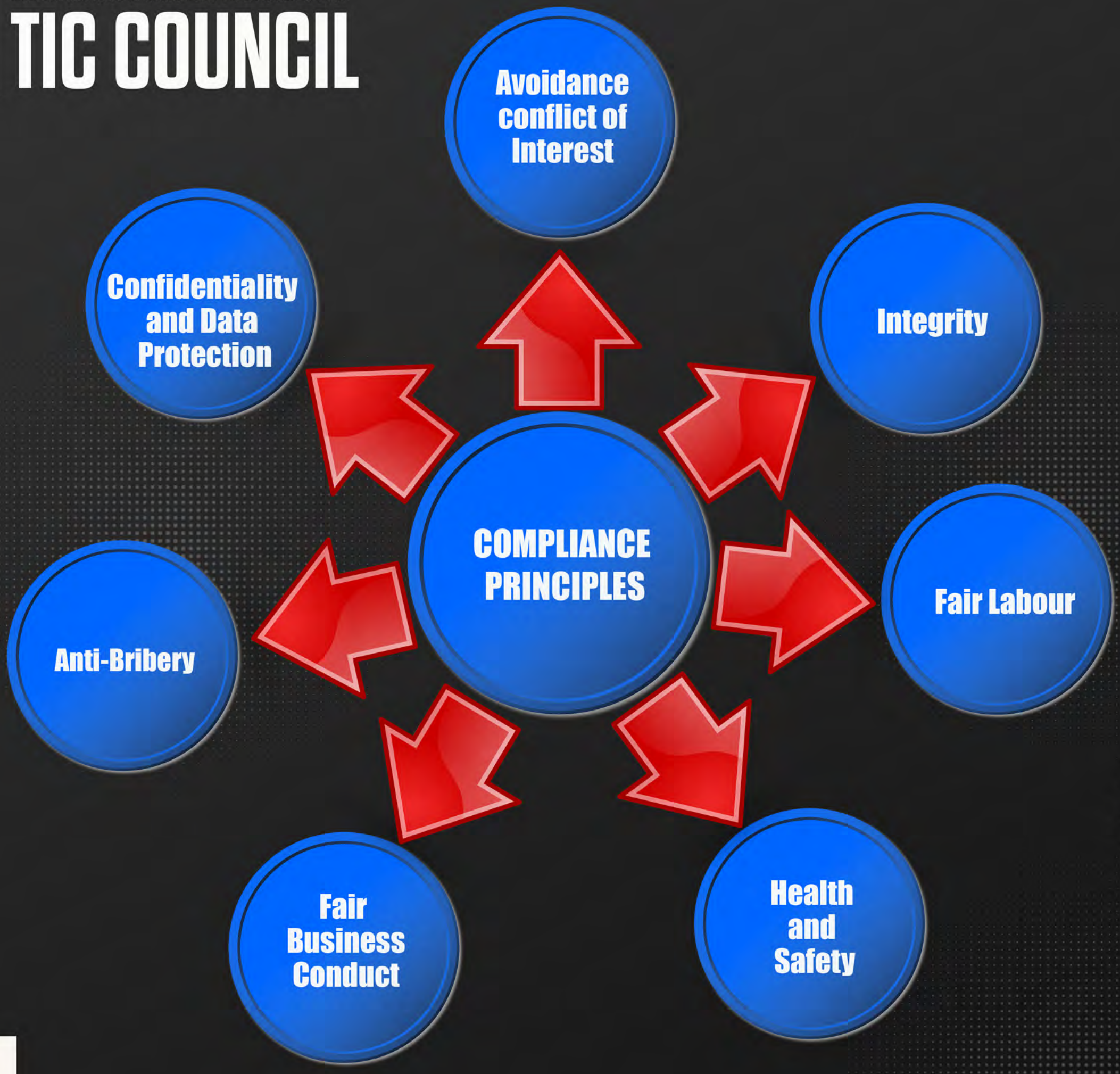
OUR MAIN PRINCIPLES AS PER TIC COUNCIL



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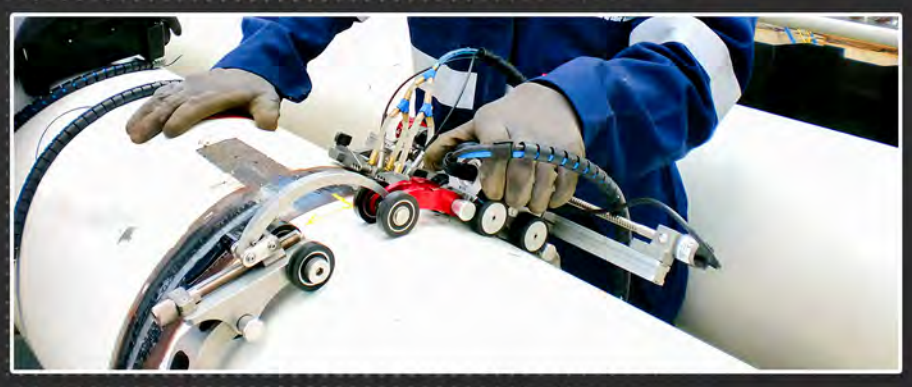
OUR SERVICES

INSPECTION SERVICES



- Visual Inspection (VT)
- In-Service Inspection (ISI)
- API 653/570/510 Inspections
  Pressure vessels, piping, storage tanks
- Welding Inspection (CWI, CSWIP)
- Turnaround & Shutdown Inspection Support
- Coating Inspection (NACE/AMPP Certified)

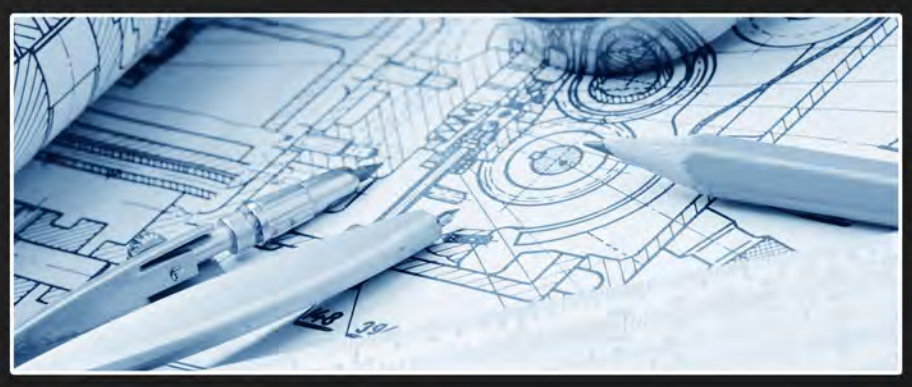
MECHANICAL INTEGRITY SERVICES

- Risk-Based Inspection (RBI)
- Damage Mechanisms Review (DMR)
- Asset Integrity Management (AIM) Programs
- Pressure Relief Device (PRD) Inspection
- Pipeline Integrity Assessment
- Fitness-for-Service (API 579)

CORROSION & MATERIALS SERVICES

- Corrosion Under Insulation (CUI) Assessment
- Cathodic Protection Testing and Design
- Corrosion Mapping (e.g., UT scanning)
- Failure Analysis & Root Cause Investigation
- Material Selection & Compatibility Assessment
- Chemical Analysis & Environmental Monitoring
- Microbiologically Influenced Corrosion (MIC) Testing

ENGINEERING & CONSULTING



- Integrity Management Consulting
- Inspection Planning & Strategy Development
- NDT Procedure Development & Qualification
- Data Management & Digital Reporting (e.g., software platforms)
- Asset Digitization (e.g., 3D scanning, digital twins)
- QA/QC Documentation and Review
- Third-Party Vendor Surveillance & Audit

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ADVANCED INSPECTION TECHNIQUES

The Advantages of Advanced Inspection Techniques

- Now the asset Integrity in almost of international companies in oil and gas field use the Risk Based Inspection System (RBI) to reduce the cost of maintenance & inspection and this system depend on the quality of inspection program.
- The advanced technique will help to produce high quality inspection More efficient inspections, higher quality readings
- Easier management of inspection data that will empowers owner-operators to make better run/repair/replace/inspect decisions and lowers the probability of leaks and failure. For example, advanced techniques like phased array ultrasonic testing (PAUT) , RMS ,time of flight diffraction (TOFD) have proven to be much more effective at detecting, characterizing, and sizing cracks and corrosion than conventional NDT methods. That's lead to more accurate fitness for service calculations and equipment end of useful life decision making.
- Performing inspections on-stream instead of necessitating entry and that will reflect in **reduce risks associated with physical entry**
- Also, the Owner-operators may not have to wait until their next shutdown to complete an assessment to compliance with codes & stan dards so may be using on-stream inspection technologies and that will reflect in cost of equipment down time and cleaning and ensure continuous and unconstrained operations to meet high performance requirements at an optimum cost

Advances Non-Destructive testing

Magnetic Flux leakage (MFL)

The technique used Electromagnetic waves to detect the corrosion or pitting for Tank bottom and annular plates

Internal Rotary inspection Systems (IRIS)

is an ultrasonic method for the nondestructive testing of pipes and tubes.
The IRIS probe is inserted into a tube that is flooded with water, and the probe is pulled out slowly as the data is displayed and recorded.
The ultrasonic beam allows detection of metal loss from the inside and outside of the tube wall

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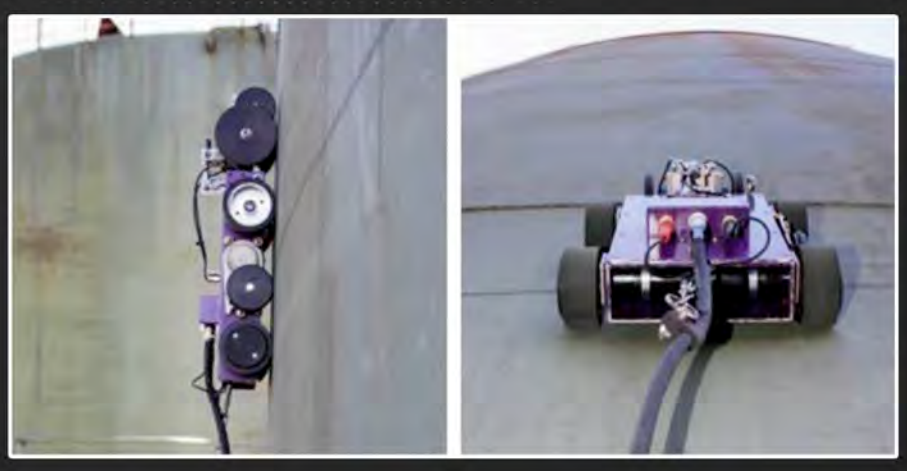
ADVANCED INSPECTION TECHNIQUES

Advances Non-Destructive testing

Pulsed Eddy Current

The technique used in detecting flaws and corrosion in ferrous material which hidden under layer of coating , fireproofing ,or insulation.



Scorpion B-Scan

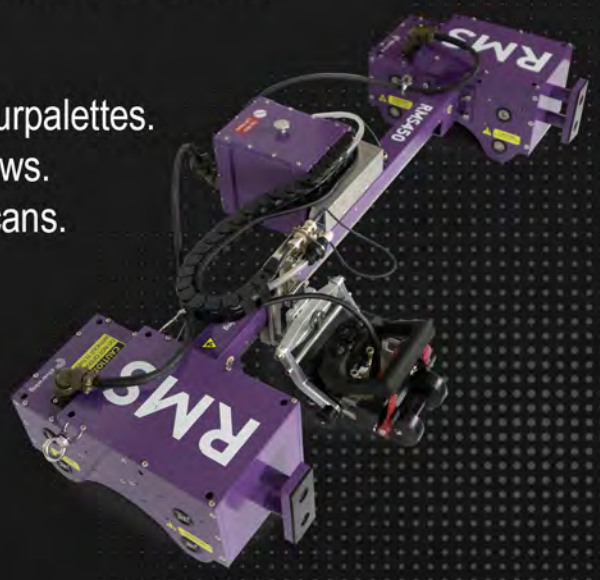
The technique is considering remote access ultrasonic crawler designed for cost effective A and B-scan for storage tanks, vessels without needing couplantlike water in RMS

The Rapid Motion Scanner (RMS2)

The Rapid Motion Scanner (RMS2) is a high-speed remote access ultrasonic corrosion mapping system which can inspect ferrous structures and pipework with a minimum diameter of six inches.

RMS2 UI Software

* 2D C-scan view with custom colourpalettes.
* Horizontal and vertical B-scan views.
* TOF or Amplitude C-scans & B-scans.
* Rotating 3D C-scan view.



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ADVANCED INSPECTION TECHNIQUES

Advances Non-Destructive testing

Long Range Ultrasonic Testing (LRUT) (Guided Wave)

Long range ultrasonic testing provides rapid screening for corrosion and erosion in pipelines.

Long range ultrasonic testing (LRUT), also known as guided wave ultrasonic testing and consider fast and cost-effective method for inspecting long lengths of pipes.

Hundreds of meters of pipe can be screened in one day from one single location.
And this technique can inspect %100 of the pipe wall.
also can be performed on piping that is in operation, insulated and buried,
and in areas that are difficult to access such as those at high elevations
so This method will save time and money that would otherwise be spent on
excavation, insulation removal and scaffolding

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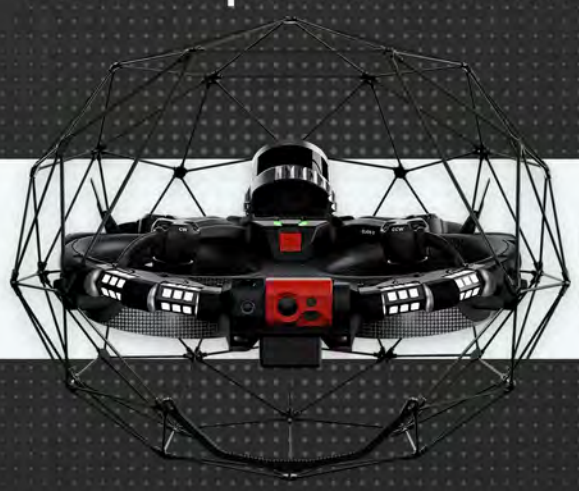
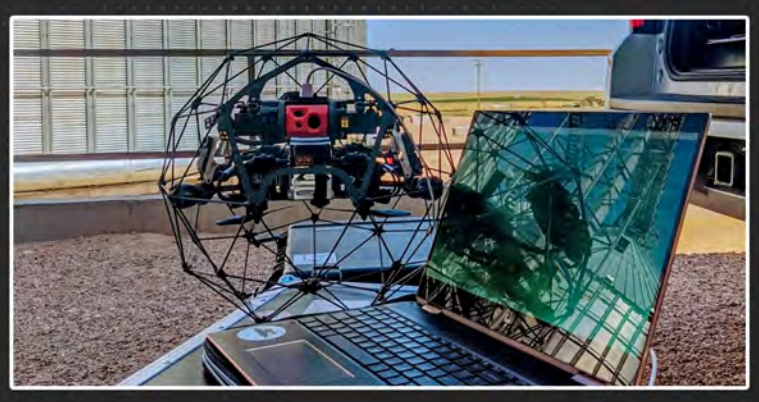
ADVANCED INSPECTION TECHNIQUES

Advances Non-Destructive testing

Drone Inspection Services



Drone inspection involves using drones to inspect and monitor various structures, areas, and assets. It provides a safer, faster, and more cost-effective solution compared to traditional methods



ADVANTAGES

- Reduces the need for human inspectors to work in hazardous environments.
- Efficiency: Drones can cover large areas quickly and provide real-time data.
- Cost-effective: Reduces the costs associated with manual inspections.
- Accuracy: Provides high-resolution images and data for detailed analysis.

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RIG AUDIT

Onshore Rig Audit

- To identify any area of risk on the rig whole people, processes and equipment could cause injury to personnel , harm to the environment, exposure tour acceptable levels of commercial risk.
- Perform an audit of the operational processes and technical equipment at the rig site to gain assurance that hazards are identified which could impede the safe and efficient operation.
- To determine that the maintenance system is compatible with vendor's recommended programs and that equipment is operating within expected design parameters
- Implementation HSE on Rig.

Offshore Rig Audit

- To identify any area of risk on the rig whole people, processes and equipment could cause injury to personnel , harm to the environment, exposure tour acceptable levels of commercial risk.
- Perform an audit of the operational processes and technical equipment at the rig site to gain assurance that hazards are identified which could impede the safe and efficient operation.
- To determine that the maintenance system is compatible with vendor's recommended programs and that equipment is operating within expected design parameters.
- To implementation HSE on Rig.
- To assure the offshore jacking system are ready to work
- Check the Lifeboats , Deck cranes , skidding system ,… etc

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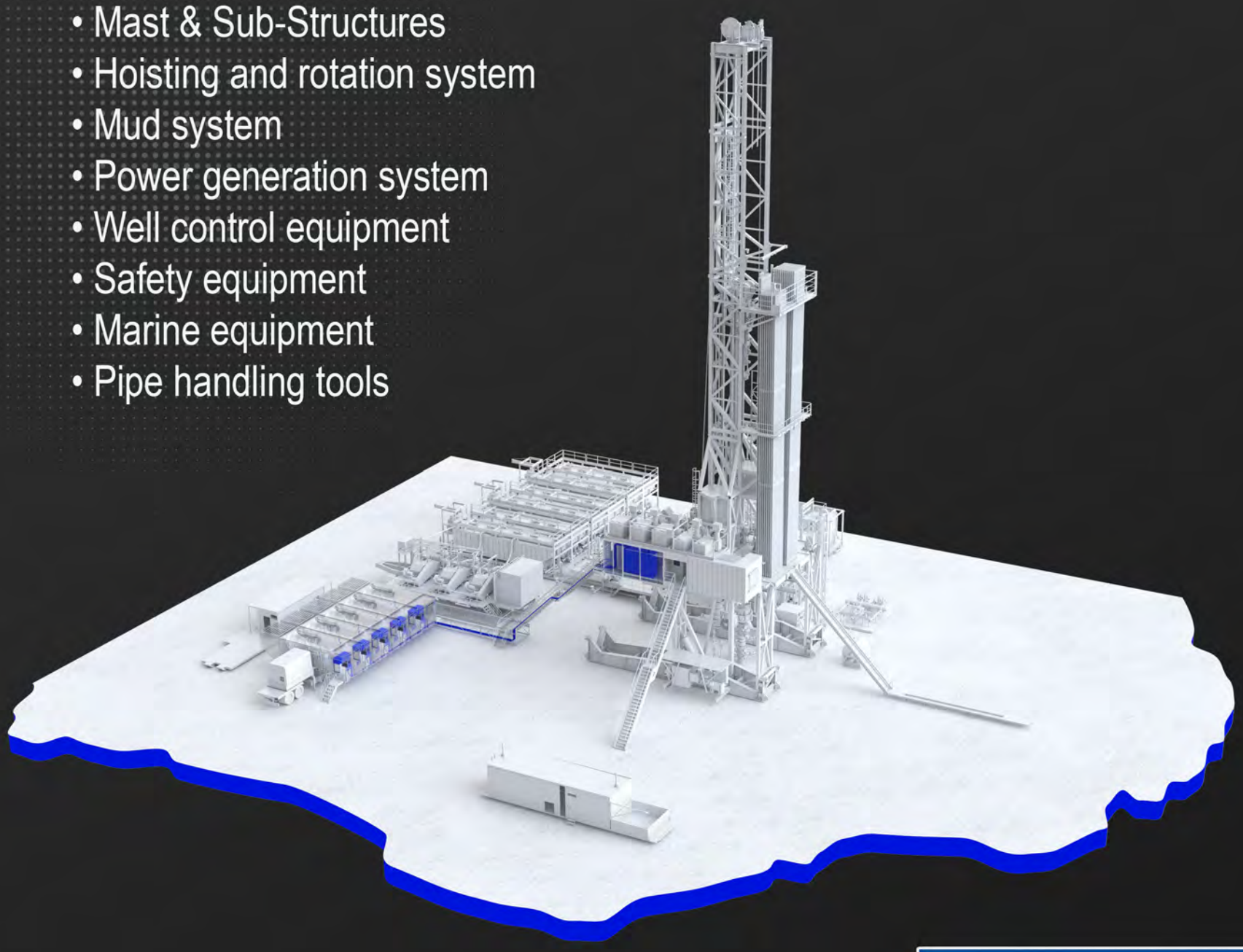
RIG AUDIT

Rig audits are generally performed on the following equipment

- Mast & Sub-Structures
- Hoisting and rotation system
- Mud system
- Power generation system
- Well control equipment
- Safety equipment
- Marine equipment
- Pipe handling tools



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RISK BASED INSPECTION (RBI)

Scope of Services:

1. Data and information Collection
2. Equipment Screening & Criticality Assessment
3. Damage Mechanism Review (DMR)
4. Risk Assessment
5. Development of risk-based inspection plans
6. RBI Softwares and methodologies

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1. Data Collection
   Design – operating – Inspection data.

Collection of design, operating, and inspection data:
- P&IDs, isometrics, GA drawings.
- Equipment datasheets.
- Material specifications.
- Corrosion loops and circuits.
- Process and operating parameters

Data Review
- Inspection history.
- IOWs excursions.
- LOPCs and failure history.
- Maintenance records.

2. Equipment Screening & Criticality Assessment

Typical equipment for RBI analysis:
- Pressure vessels.
- Piping systems.
- Storage tanks.
- Heat exchangers.

Criticality ranking:
- Safety impact.
- Environmental impact.
- Reputation.
- Production loss.

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RISK BASED INSPECTION (RBI)

3. Damage Mechanism Review (DMR)

Creation of corrosion loops and identification of applicable degradation mechanisms including:

- Corrosion (internal/external).
- Erosion.
- Cracking mechanisms.
- Fatigue.

4. Risk Assessment

Probability of Failure (POF)
Based on:

- Corrosion rates.
- Metallurgical degradation.
- Cracking mechanisms.
- Inspection effectiveness.
- Operating conditions.

Consequence of Failure (COF)
Evaluation of:

- Health & safety impact.
- Environmental consequences.
- Reputation damage.
- Financial/production losses.

5. Development of risk-based inspection plans

Establishment of:

- Inspection intervals.
- Inspection methods (NDT techniques).
- Inspection locations (CMLs/TMLs).
- Integrity Operating Windows (IOW) development.

Recommendation of inspection techniques based on failure modes:

- General corrosion.
- Localized corrosion.
- Cracking.

6. S-RBI Softwares and methodologies

Experience with industry RBI tools

- S-RBI software (IMS PEI).
- Antea.
- GE APM (Meridiam).
- Nexus (Wood PLC).

Experience with RBI Methodologies

- API 581.
- Shell RBI Methodology.
- BP RBA Methodology.

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