

TCR Technology Newsletter

**3rd Quarter
 2024**

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Pulsed Eddy current (PEC)



What is Pulsed eddy current (PEC)

Pulsed Eddy Current (PEC) is an versatile electromagnetic inspection technique in non-destructive testing. used to detect wall loss on ferromagnetic structures such as carbon steel and cast iron. It provides a relative volumetric measurement converted into an averaged thickness measurement based on the calibration area.

PEC does not require direct contact with the surface and is commonly used for detecting corrosion under insulation/fireproofing.

PEC has been successfully deployed over the last decades for a variety of corrosion related applications, most notably for **Corrosion Under Insulation (CUI) inspections, Corrosion Under Fireproofing (CUF) and Flow Accelerated Corrosion (FAC)**. This technology has proven to be an efficient inspection tool, allowing for the detection of corrosion without having to remove coating or insulating material over typical pipes, tanks and vessels. one of the most important issues facing the petrochemical industry today. PEC have been shown to work through weather jacket (or cladding) and present major upsides compared to the brute force approach which consists in removing the insulation to perform a visual or ultrasonic inspection.

Pulsed Eddy current (PEC)

Advantages

- Direct Contact with the surface or surface preparation is not required.
- Measures the full wall thickness
- Sensitive to near-side and far-side defects.
- Inspect through insulation, coatings, paints, concrete fireproofing. Marine growth.
- Inspect through aluminium stainless steel, and galvanized steel weather jackets.
- Inspect structures featuring chicken wire and rebars.
- Unaffected by water and ice
- No costly or unnecessary removal of insulation
- No safety issues (unlike X-rays) and performed on working components
- Easy to use, fast learning curve.

Limitations

- Edge effect (about the size of the probe's footprint) near metallic structures.
- Unable to discriminate near-side and far-side defects
- small pitting's will not be detected.
- Undersize flaws smaller than the averaging area of the probe.
- Difficult to use on elbows smaller than 200 mm (8 in) in diameter.

Inspection Ready

The set is splash water tight, robust and easy to operate. Data collection is fast (two measurements per second) and has a scanning mode. Two cables, length 8m (26ft), is included in the standard kit. Up to 100m (328ft) can be provided.

Probes

There are three standard probes, each for a different lift-off range. The probes are optimized for defect sensitivity. Underwater probe sets are available covering different depth rating and lift-off ranges.

Choosing the right probe is a key of success for a great inspection. Indeed, every probe has a specific footprint at zero lift-off. The footprint is the area with the most sensitive detection capabilities. As PEC is a volumetric measurement, Lyft can detect an indication that is a minimum volume ratio of 15% of the footprint. The footprint is calculated easily.

$$\text{Footprint} = 0.65 \times \text{liftoff} + \text{Footprint}_{\text{zero liftoff}}$$

Pulsed Eddy current (PEC)

Data output

Colour-coded wall thickness readings are displayed on the touch screen display during data recording.

A MS-Excel field report can be produced quickly by the tablet computer. In addition, PC-based software is provided for further analysis and reporting.

Portable Power

Fast and reliable PECT measurements require a high-energy magnetic pulse, which is delivered by a dedicated powerful battery inside the data acquisition unit. On board computer loaded with PEC software is powered by two separate batteries. Both type of batteries are provided with external chargers and are hot-swappable.

Standard applications

Corrosion Under Insulation (CUI) and Fireproofing (CUF)

The PEC probe is a high-productivity probe for CUI on insulated pipes as it can scan dynamically with an 18in (457mm) coverage. It can scan from 6in (150mm) OD to flat surfaces, and it can inspect through 4in (100mm) of insulation. The same probe can be used to inspect through thick concrete fireproofing to assess the condition of sphere legs and vessel skirts.

Scab and blister assessment

The High Resolution probe has achieved the smallest footprint ever done in pulsed eddy current. It gives the best estimation of remaining ligament under scab corrosion. It provides top-quality data with a high productivity rate. This technique is a safe assessment of the remaining wall thickness.

Flow-Accelerated Corrosion (FAC)

You can scan an isolated elbow to assess FAC without removing the insulation. This is cost effective when you are regularly monitoring the elbows of a specific system. To perform this kind of inspection. Standard single elements probes are utilized.

Certifications:

ISO 9001-2015 Certificate



CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

TCR Arabia Company Ltd.

Main Site: King Abdul Aziz Seaport Facility, P.O. Box 8143, Dammam
32211, Kingdom of Saudi Arabia

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Conventional Non-Destructive Testing Services (NDT), Advanced Non-Destructive Testing Services (ANDT), Metallurgical Services, Mechanical Laboratory Testing Services, Welding Inspection Service, Post Weld Heat Treatment (PWHT).

Certificate Number:

21111010003

Initial Certification Date:

25 March 2014

Date of Certification Decision:

02 March 2023

Issuing Date:

02 March 2023

Valid Until:

24 March 2026



intertek



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Calin Moldovean

President, Business Assurance

Intertek Certification Limited, 10A Victory Park,
Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS
accredited body under schedule of
accreditation no. 014.



Certifications:

Mechanical Testing Lab of TCR Arabia is now ISO-17025 Accredited



Certifications:

TCR Arabia is now ISO 14001 & 45001 Accredited



CERTIFICATE

This is hereby certified that the Environmental Management System of

TCR ARABIA COMPANY LTD.

P.O. Box 8143, Dammam 32211, TCR Arabia Company Ltd. Gas Gardens, King Abdul Aziz Seaport Facility, Dammam, Kingdom of Saudi Arabia.

Has been found to comply with the requirements of

ISO 14001: 2015

This certificate is applicable for the following scope:

Conventional Non-Destructive Testing Services (NDT), Advanced Non-Destructive Testing Services (ANDT), Metallurgical Services, Mechanical Laboratory Testing Services, Welding Inspection Service, Post Weld Heat Treatment (PWHT).

Certificate Number: KAEM202405031

Date of initial registration:	13 May 2024
Surveillance audit on/before:	13 April 2025
Certificate expiry:	13 May 2025
Recertification due:	12 May 2027







Authorized Signatory
KVQA Assessment Pvt. Ltd.

Website: www.iso-registration.com | Email: info@iso-registration.com
 KVQA Assessment Private Limited is accredited to United Accreditation Foundation (IAF). IAF is internationally recognized by having a signatory status across multilateral recognition arrangement of International Accreditation Forum (IAF) and Asia Pacific Accreditation Cooperation (APAC).
 The certificate is valid subject to successful completion of surveillance audits. Verify validity/status on www.iso-registration.com or on email at info@iso-registration.com
 UAF address: 400, North Centre Dr, STE 202, Norfolk, VA23502, United States of America



CERTIFICATE

This is hereby certified that the Occupational Health & Safety Management System of

TCR ARABIA COMPANY LTD.

P.O. Box 8143, Dammam 32211, TCR Arabia Company Ltd. Gas Gardens, King Abdul Aziz Seaport Facility, Dammam, Kingdom of Saudi Arabia.

Has been found to comply with the requirements of

ISO 45001: 2018

This certificate is applicable for the following scope:

Conventional Non-Destructive Testing Services (NDT), Advanced Non-Destructive Testing Services (ANDT), Metallurgical Services, Mechanical Laboratory Testing Services, Welding Inspection Service, Post Weld Heat Treatment (PWHT).

Certificate Number: KAOH202405032

Date of initial registration:	13 May 2024
Surveillance audit on/before:	13 April 2025
Certificate expiry:	13 May 2025
Recertification due:	12 May 2027







Authorized Signatory
KVQA Assessment Pvt. Ltd.

Website: www.iso-registration.com | Email: info@iso-registration.com
 KVQA Assessment Private Limited is accredited to United Accreditation Foundation (UAF). UAF is internationally recognized by having a signatory status across multilateral recognition arrangement of International Accreditation Forum (IAF) and Asia Pacific Accreditation Cooperation (APAC).
 The certificate is valid subject to successful completion of surveillance audits. Verify validity/status on www.iso-registration.com or on email at info@iso-registration.com
 UAF address: 400, North Centre Dr, STE 202, Norfolk, VA23502, United States of America

Approvals:

TCR Arabia is now an approved contractor in SABIC for providing high-end inspection services like HTHA/FFS, Metallurgy Solutions and Root Cause Analysis.

Classification: Internal Use



Tuesday, August 20, 2019

Subject: APPROVED CONTRACTOR CONFIRMATION

Dear Mr. Darwin,

This is to confirm that "TCR Arabia Ltd. KSA" is an approved third party and part of "Approved Contractor List" (ACL) of SAUDI BASIC INDUSTRIES CORPORATION (SABIC) to conduct business as a third party inspection & testing contractor for onshore/ offshore services for SABIC site & Mega projects. The onshore/offshore services are:

- Conventional NDT techniques (RT,UT, PT, MPT, VT & PMI)
- Advanced NDT techniques (ToFD, PAUT, MFL & tube inspection).
- Material testing (destructive)
- Welder qualification
- HTHA/FFS services
- Metallurgy solutions
- Root Cause Analysis

However, this certificate has been issued upon the request of above named contractor for whatever purpose it may serve him without any liability on the part of SABIC.

Best Regards,



Gehad Al-Otaibi
Senior Manager
Global Suppliers relationship Management



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Global Procurement Services
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Kingdom of Saudi Arabia
T: 966 13 350 6600
F: +966 13 350 6333
www.sabic.com

Saudi Basic Industries Corporation
Saudi Joint Stock Corporation
Authorized capital: SAR 30 billion
CR: 1010010813

الشركة السعودية للصناعات الأساسية
شركة مساهمة سعودية
رأس المال المصرح به 30 بليون ريال
رقم التسجيل 1010010813

سابق
الخدمات المشتركة
خدمات المشتريات العالمية
مستوى جيب 11115
ج. المنطقة الحرة الصناعية
الجبيل 31961
هاتف: +966 13 350 6600
فاكس: +966 13 350 6333
www.sabic.com



ASNT Partner



ISO 9001-2015 Certified



ISO 17025 Accredited

Approvals:

TCR Arabia is an approved contractor in SAUDI ARAMCO for Welder Testing Agency.

Revision Date: May 06, 2024
Rev-09

أرامكو السعودية
saudi aramco



INSPECTION DEPARTMENT Service Provider Review Committee

Approved Welder Testing Agencies





TCR Arabia Company Limited

Inspection, Testing & Advisory
Redefining Reliability

ARAMCO & SABIC Appreciation Letters:



Services Portfolio



TESTING

Material Testing

Mechanical

Tensile, Impact, Hardness, Bend, Elongation, Yield

Corrosion

ASTM A923, A262, G28, G48

Welder Qualification

WPS, PQR, WQT, Welder Certification

Civil Laboratory

Construction Material Testing, Concrete, Soil, Aggregates & Field Tests

Metallurgy Testing

In-situ Metallography,

Failure Investigation

Remaining Life Assessment

Fitness for Service



INSPECTION

Non-Destructive Testing (NDT)

Conventional NDT

RT, MT, PT, UT, UTT, FM, PMI, HT

Advanced NDT

ToFD, PAUT, Corrosion Mapping
Helium Leak, Thermography, MFL
ECT, RFT, IRIS, HTHA, High Temp UT

Robotic Inspection Services

Submersible Inspections

Inspection of buried & above ground assets

Non-Metallic Testing Lab.

FRP/GRP/Composite Lab Testing



CONSULTING

Inspection Manpower

NDT Technicians, Plant Inspectors, Inspection Engineers, Corrosion Engineers

- Stress Analysis
- Risk Based Inspections (RBI)
- Damage Mechanism Study
- Third Party Inspection
- Coker Drum Inspection
- Trainings (NDT, Metallurgy, Welding)
- Plant Asset Integrity Management
- Corrosion Study



TCR Arabia Company Limited

Inspection, Testing & Advisory

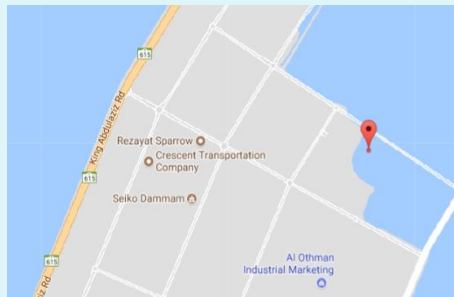
Redefining Reliability

Location

TCR Arabia Head Office & Labs are located in Dammam
Branch Offices in Jubail & Yanbu



GPS Location: 26.450525, 50.193787



ASNT Partner



ISO 9001-2015 Certified



ISO 17025 Accredited

Events

TCR Arabia is featured on The Gulf Time newspaper page 8 under Energy dated 14 June 2023

TCR Arabia, an Indian JV company, completes 15 successful years in Kingdom of Saudi Arabia

One of the key reasons for TCR Arabia's success is the expertise of its founding companies

SAUDI ARABIA / GULF TIME

TCR Arabia is a company that specializes in engineering services specifically in the field of Material Testing, Advanced Non-Destructive Testing and Metallurgical investigation. Founded in 2007 as a joint venture between TCR Engineering Services (India) and GAS Arabian Service (Saudi Arabia). The company is based in Saudi Arabia and has rapidly established a reputation for reliability and quality in all sectors it services namely oil & gas, petrochemical, mining, desalination, power, fertilizer and other such process and manufacturing industries.

One of the key reasons for TCR Arabia's success is the expertise of its founding companies. TCR Engineering Services (India) has over 50 years of experience in providing engineering solutions for a wide range of industries, including oil and gas, power, and infrastructure. On the other hand, GAS Arabian Service is a leading provider of engineering services in the Middle East, with a strong reputation for delivering high-quality projects on time and within budget.

Together, TCR Arabia combines the best of both worlds: The experience and knowledge of TCR Engineering Services (India) with the local expertise and understanding of GAS Arabian Services. This unique combination of expertise enables TCR Arabia to provide a comprehensive range of engineering services to its clients in the region.

TCR Arabia offers a wide range of services, including Advanced Non-Destructive Testing Services, Material Testing Services (Mechanical, Metallurgical and Non-Metallic Products), Engineering & Consulting on all process related assets, Welding Inspections, Welder Qualifications, Heat Treatment etc. TCR Arabia has partnered with global specialized companies in providing solutions to clients on Robotic Inspections, Coke Drum Inspections, Boiler Inspection & Life Assessment etc.

As an ISO-9001-2015 Certified and ISO-17025 Accredited Organization, TCR Arabia ensures all its services are delivered to its clients as per global standards and prescribed procedures. Trained and qualified staff ensure that quality is not compromised at any level of testing and inspection works.

As an employee oriented organization, we value the contributions of every single employee in the growth of our organization. Our employees play a key role in planned expansion, strategic



development and technical expertise which results in winning the trust of our valued clients and to serve them to higher standards everytime. Today we are a strong team of qualified API Engineers, NDT Engineers, Corrosion Engineers, Metallurgists, Skilled Technicians.

One of the key factors that sets TCR Arabia apart from its competitors is its commitment to safety. The company places a strong emphasis on safety in all of its projects, and it has implemented strict safety procedures to ensure the safety of its employees, as well as its clients. TCR Arabia also carries out regular safety audits to ensure that all of its projects are being carried out in compliance with the highest safety standards.

TCR Arabia is committed to develop the local manpower (Saudi Nationals) by providing 'on the job' trainings, class-room trainings in the field of NDT & Material Testing. Consistent growth in the percentage of IKTVA (In-Kingdom Total Value Addition) has yielded positive results in the success of TCR Arabia.

In conclusion, TCR Arabia is a leading engineering services company in Saudi Arabia and the Middle East. Backed by the trust of its valued clients and the ability of its staff to deliver quality services, the organization is motivated to serve and deliver best results year after year.



Syed Ameen Hassan, Country Manager, TCR Arabia, Saudi Arabia

Syed Ameen heads the TCR Arabia operations in Saudi Arabia. MBA in Marketing and Finance, from Chifley University, Australia, Syed Ameen has been instrumental in developing the business of TCR Arabia from its inception stage. Experience of over 25 years in the Saudi Arabian and Middle East market, specifically in the down-stream industry business, helps Syed Ameen to reach out to the decision makers and also run the operations in a professional manner. Business plans, budgeting, decisions on CAPEX / OPEX and Resources Management are his key roles and reports to the EXCOM & Board Members on the performance of the Organization.

Under the leadership of Syed Ameen, the organization has grown from its incubation stage to one of the top Inspection & Testing Companies in Saudi Arabia. Ensuring routine business with all major clients is the key to sustenance of the Organization and Syed Ameen has been instrumental in gaining long term contracts with major clients like Saudi Aramco, SABIC, TASNEE, MAADEN, SWCC etc.

Expansion of the organization by setting up new service areas like Robotic Inspection Services, Welder Qualification Department, Mechanical Testing Lab, Metallurgical Testing Lab, Corrosion Testing Lab are some of key achievements.

Operational alliance with major international service providers like CANAP Engineering of India for Stress Analysis Studies, CIA of Canada for Coker Drum Inspections, Planys of India for Submersible Robotic Inspection and so on were formed under the leadership of Syed Ameen to provide advance inspection and technical support to all of TCR's valued clients in KSA. Adapting to the fast evolving Inspection Field with new and advanced techniques to help the client save loss of production time and improve profitability, TCR team is consistently working in offering safer, faster and reliable inspection and testing techniques to clients under the leadership of Syed Ameen.

An Active team player and a firm believer in Team Work, Syed Ameen has been able to develop a team of professional engineers, technicians, admin staff, and support staff to work towards a common goal of developing the organization.

TCR Arabia serves majority of its clients in the 'downstream industry' which includes Saudi Aramco, SABIC, TASNEE, CHEVRON, ADVANCED, SWCC, Saudi Electricity Company, Petrorabigh, SADARA, SATORF, MAADEN and so on. It also serves all major contracting companies in infrastructure development and maintenance projects

Events

Celebrating 50 years of TCR




REDEFINING ON-TIME QUALITY
Material Testing | NDT | Consulting & Inspection

*Winner of "Best Laboratory" Award by NACE
NABL, ISO 17025, ISO 17020, ISO 46001, IIR, BIS Accredited*

Materials Testing Solutions and Inspection Asset Integrity & Plant Reliability Consultants

Since 1973, TCR Engineering Services is well known for its work ethics, precision, transparency, & reliability and has been trusted by over 3500 customers across India. TCR's expertise guarantees superior quality, safety, and reliability, empowering business to reach new heights while fueling the national economy through enhanced product performance, reduced downtime, and accelerated innovation. Together, we are the key drivers of the "Make in India" movement to build a vibrant and prosperous economy.

TCR has completed NDT works on over 3000 kms. of Cross-Country Pipeline for EPC companies on IOCL and GAIL sites. TCR offers specialized fatigue testing for Reinforcement Couplers and Grouter for Mechanical Splices of Bars in Concrete used in Infrastructure and Road construction projects. Defence industry vertical is served by undertaking Fracture Toughness and Fatigue Crack Growth Rate analysis. TCR has worked on over 5000 failure investigation cases, over 75 Fitness For Service assignments and over 300 boiler RLA projects.

TCR is approved by IOCL, GAIL, RIL, L&T, JSW, HAL, NMRL, DMRL, PDIL, DRDO, COAE, RITES, BMC, Mecon, EIL, BSE, NSE, Mazagon Dock, NPCIL, Customs Authority India and Saudi Aramco, SABIC, PDO, QCHEM, QAFCO, KOC, KNPC, Iraq Ministry of Oil, SHELL, National Oilwell Varco, Sakhalin Energy and many others internationally. TCR is the preferred laboratory for members of the Bombay Metal Exchange and the Mumbai Steel Traders Association.

TCR prides itself in being a Pan-India based material testing and inspection services company with global operations in Saudi Arabia, Qatar, Kuwait, Malaysia and Nigeria.

MATERIAL TESTING LAB

- Mechanical Testing
- Chemical Analysis Spectro
- NACE Sour Gas Corrosion
- CTOD & Fracture Toughness
- Coupler & Rebar Fatigue Test
- Railtrack butt joint Fatigue
- Microstructure Studies
- SEM & EDAX Analysis
- Welder Qualification
- Hot Tensile
- RoHS Compliance
- Construction/Civil Lab
- Composite Testing
- Wet Chemical

NDT & INSPECTION

- Cross Country Pipeline RT
- ToFD and PaUT
- Robotic Reformer Tube Inspect
- Robotic Tank Inspection
- Eddy Current Test for Tubes
- IRIS, RFET and MFL
- Metallographic Replica
- Helium Leak Detection
- PMI-Positive Material Id
- Gamma Radiography
- PWHT and Heat Treatment
- Civil NDT for Concrete
- Inspection of Bridges
- Third Party Inspection

ENGINEERING CONSULTING

- Asset Integrity Management
- Pipeline Integrity
- Fitness for Service
- Remaining Life Assessment
- Boiler Audit
- Failure Analysis Investigation
- Insurance & Litigation Referee
- Digitalization of RT Films
- Plant Relocation Advisory
- Manpower Supply for Turn Around
- CAD/CAM and Piping Stress Analysis
- Custom Research
- Welding Consulting
- Plant Reliability Training

Events

Celebrating 50 years of TCR





Mumbai Corporate Office
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TCR Assam
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Opp. K. J. Polytechnic College,
Above Sales India Showroom,
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ISO/IEC 17025 : 2017
Accredited Testing Laboratory by

NABL

Vide Certificate No. TC - 6905



TCR Arabia Company Limited
Inspection, Testing & Advisory
Redefining Reliability

Events

TCR Arabia will be participating in:

ORGANIZED BY

CLASS PRO
Saudi & GCC Operations Management

سابك
sabic

SABIC CONFEX 2025

JUBAIL INDUSTRIAL CITY - SAUDI ARABIA | 26th - 30th JANUARY 2025

🌐 www.sabic-confex25.com | [in](#) | [X](#) | [@](#) SABIC.confex25 | [✉ contact@sabic-confex25.com](mailto:contact@sabic-confex25.com)

The banner features a light blue background with several golden molecular structures scattered across it. The SABIC logo is prominently displayed in the top right corner, and the event title "SABIC CONFEX 2025" is centered in a large, bold, grey font.

SABIC CONFEX 2025
January 26-30, 2025

Events

Best employee awards 2nd Quarter





TCR Arabia Company Limited

Inspection, Testing & Advisory

Redefining Reliability

Events

Saudi ARAMCO RTR Inspection Technology Day 2024

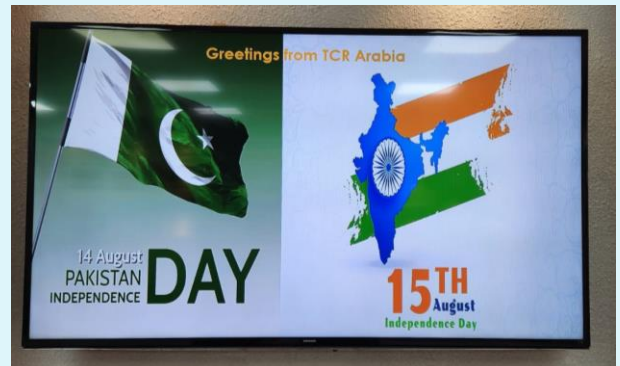


Events

SAC Audit



Pakistan & India Day





TCR Arabia Company Limited

Inspection, Testing & Advisory

Redefining Reliability

Events

Participated at Jubail Corrosion Conference 2024
JUBCOR



Events

Participated at Jubail Corrosion Conference 2024
JUBCOR



Events

Saudi National Day 2024



Trainings

Visual inspection training for TCR Arabia by Waygate Borescope Equipment



Trainings

Co-Op Training for Al Yamamah University Students Conducted by TCR Arabia

