

**CONTINUUM  
INSPECTION**

**SHUTDOWN/  
TURN-AROUND  
INSPECTION**

**IN-SERVICE  
INSPECTION**

**CONSTRUCTION &  
COMMISSIONING  
INSPECTION**

**SOURCING &  
PROCUREMENT  
INSPECTION**

MATERIAL SCIENCES, DESIGN & ENGINEERING



# TCR QATAR

## Actionable Test Results

A BRAND FROM THE LEGACY OF TCR ENGINEERING SERVICES, INDIA  
WITH BIEWU INTERNATIONAL TRADING WLL IN QATAR



## Delivering Outcomes, Fueling Growth

TCR empowers its clients through services that generate economic value by identifying and addressing customer needs effectively. It's comprehensive end-to-end offerings allow customers to procure wisely, planning damage specific inspection, manage shutdowns and use actionable insights for enhancing profitability and achieving growth.

## Materials Testing Laboratory

### Mechanical

#### Fatigue and Fracture Toughness

CTOD, K1c, J1c, Fatigue crack growth, High-Cycle/Low-Cycle Fatigue, S-N Curve

#### Mechanical Testing

Tensile & Bend, Impact, Hardness, Nick Break and Weldability, Creep, and Stress Rupture, Hydrogen Embrittlement ASTM F519/B577

#### Metallurgy Evaluation

Macro and Micro Examination on SEM/EDS & Optical Microscope

### Chemical

#### Material Composition

Spectrometers (XRF, OES, ICP, AAS), Wet Chemical, Oil Analysis by Ferrography, RoHS Compliance, Lead Inspection

#### Refractory Testing

Ores and Minerals Testing

#### Sand Content

Oxygen, Nitrogen and Hydrogen

### Corrosion

#### Corrosion Studies

Sour Gas (HIC/SSC/SOHIC) – NACE TM0284/TM0177/TM0103, Chloride Stress - ASTM G 36, SCC of Aluminum Alloy - ASTM G44/G47, Pitting/Crevice (Critical Temperature) - ASTM G48, Potentiostatic/Potentiodynamic Anodic Polarization - ASTM G5, Chloride Stress - ASTM G 36, Corrosion of Aluminum NASTM ASTM G67, Exfoliation of Aluminum - G66/G34, SCC of Aluminum – ASTM G103, Intergranular – ASTM A262/ DIN EN ISO 3651, Immersion Corrosion – ASTM G31, Ammonia Vapor Test – ASTM B858

## Non Destructive Testing (NDT)

### Conventional

#### Base Line NDT

Ultrasonic Flaw Detection, UT Thickness, Dye Penetrant, Magnetic Particle, Ferrite Measurement, Holiday Detection Surface Roughness, Demagnetization, Paint and Coating Thickness

#### Metallographic Replica

In-Situ Metallography Replica, SEM and EDS Analysis, Microstructure Characterization for RLA

#### Positive Material Identification (PMI)

### Advanced

#### Phased Array and ToFD

**Tube Inspection:** Eddy Current, RFET, IRIS, MFL, Helium Leak Testing, Acoustic Eye, Saturated Eddy Current, Automated Reformer Tube Inspection (ARTiS)

**Tank Inspection:** Robotic Inspection of Coker Drums, Acoustic Emission Testing of Tanks, Remote Inspection of Tank Bottom

**Boiler Health:** EMAT, Accelerated Creep Rupture Test, Oxide Scale Measurement

### In-Service

#### NDT targeting specific Corrosion

**Damages:** HTHA Inspection, One Micron Detection using UT, Carburization Detection, HIC Detection, High temperature Corrosion Mapping, Mid Wall Fissures Detection, Stepwise Crack Detection (SWC)

**Visual Inspection:** Thermography, Robotic Underground buried Pipeline Inspection, Underwater Inspection and cleaning by ROV, Boroscopy, Videoscopy

**Storage Tank:** In-service Robotic Tank Inspection, Tank Condition by Thermography

## Welder Certification and Procedure Qualification

Welding Inspectors visits for Qualification of Welder

WPS/PQR Testing per coupon as per ASME Section IX, AWS D 1.1, API 1104, QP-STD-R-006, QP-STD-R-002

Renewal of Welder ID Cards

Post Weld Heat Treatment: Electrical Resistance HT with Talented Team & Pre-Heating

Welding Procedure Specification (WPS) development

Weldability Evolution: Microstructure & Micro-hardness Tests

Welding Consumable Evaluation: Tests as per ASME Section 2 part C

## Plant Health Assessment

### Consulting

#### Failure Analysis

Pressure Equipment Integrity Incident Investigation per API 585

#### Remaining Life Assessment

Fitness for Service as per API 579 ASME FFS 1 (Level 1 and 3)

#### Fire Damage Assessment

**Engineering Design and Analysis Services:** Computer Aided Designing (CAD), Computer Aided Engineering, Reverse Engineering and Prototyping, 2D to 3D Conversion, Finite Element Modeling, Piping Stress Analysis

### Research

**Studies:** API 590/581 guideline based Risk-Based Inspection study program to research corrosion damages and mapping of Turnaround data based on Business/Operations Risk Integrity Operating Window Study as per API 584

**Contract Research and Development:** Technical Help For Indigenization, Selection of Materials, Quality Improvement, Solutions Of Critical Weld Problems

### Sourcing & Procurement

**Third Party Inspection and QA** Factory Audit, OEM Development, Raw Material Inspection, Picking of Samples and Testing Coordination, Initial Production Check, In-Production Check, Random Inspection, Loading Supervision **Product and Material Sourcing**

## Turnaround and Shutdown Management

### Expert Consultants

RBI and Asset Integrity Management Experts  
Metallurgists and Corrosion Scientists  
API Plant Inspectors with 510, 570, 653 as well as 579/580 certs  
ASNT Level III Experts and SNT-TC-1A or PCN Level II Techs  
QA/QC Inspectors for Static and Rotating Equipment  
Welding Inspectors with AWS or CSWIP  
Painting/Coating Inspectors with NACE or BGas  
Mechanical Destructive Testing and Lab Chemists

Refractory Consultant  
Valve Specialists  
Heat Treatment PWHT specialists  
Engineering Design Consultants on CAD/CAM  
Simulated Process and Engineering Researchers



Tensile/CTOD/Fatigue



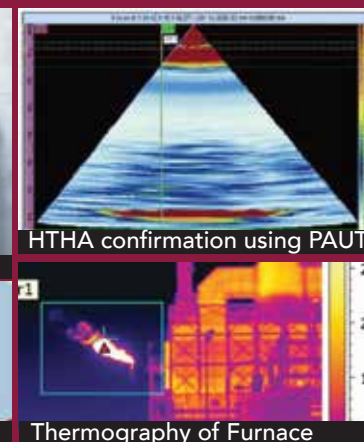
Chemical Analysis Spectrometer

HIC/SSCC Corrosion Test



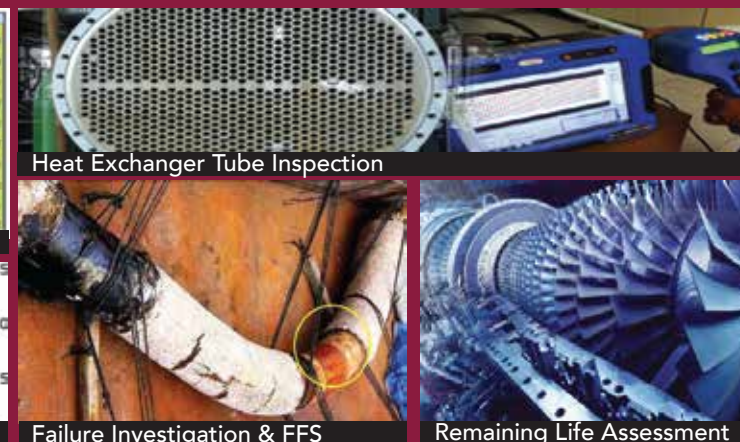
Replica Examination

Automated Reformer Tube Inspection



HTHA confirmation using PAUT

Thermography of Furnace

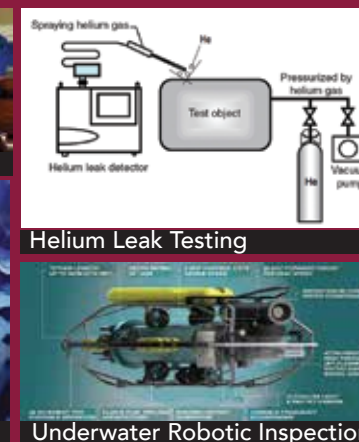


Heat Exchanger Tube Inspection

Failure Investigation & FFS

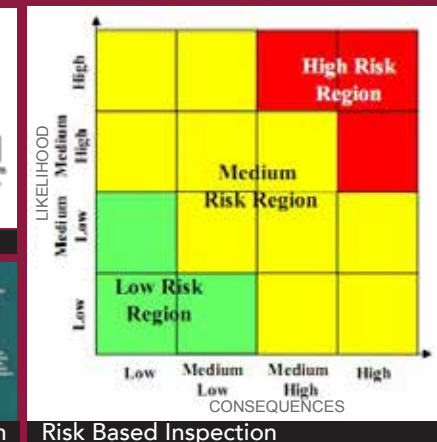


Remaining Life Assessment



Helium Leak Testing

Underwater Robotic Inspection



Risk Based Inspection

## MULTI-LEVEL SOLUTIONS

TCR brings about the necessary transformation for its customers and differentiates itself from the traditional cookie-cutter approach with comprehensive and actionable solutions with the assistance of expert team members across:

### I. SOURCING & PROCUREMENT INSPECTION

Identifying the needs of Traders and Suppliers to procure wisely by establishing material strength and composition

### II. CONSTRUCTION & COMMISSIONING INSPECTION

Addressing the needs of EPC and Infrastructure companies to create baseline data and faster completion of weld joints

### III. IN-SERVICE INSPECTION

Planning corrosion damage specific inspection with the usage of high temperature probes and robotics

### IV. TURN-AROUND INSPECTION

Manage shutdown through expert manpower as well as strong understanding of API 580/581 guidelines set by RBI

### V. CONTINUUM INSPECTION

Actionable insights for enhancing Plant's profitability and achieving growth through engineering research based on metallurgy and design

## MARQUEE CLIENTS



## Complete Quality Assurance Partner for Optimum Plant Health

TCR undertakes all aspects of mechanical destructive and NDT tests, metallurgical and asset integrity management-based consulting, engineering design, and simulated corrosion research. Global experts with deep industry-specific plant experience from TCR are passionate about metallurgy and problem-solving. A dedicated sample collection center and operational NDT setup are operational at the offices of TCR's representative agent BIEWU International Trading in Doha, Qatar.

**TCR Qatar**  
BIEWU International Trading WLL  
P.O. Box: 24534  
#3, Al Emadi Building,  
Ras Bu Aboud Street  
Ummgwillina, Doha, Qatar

✉ [Qatar@tcreng.com](mailto:Qatar@tcreng.com)

🌐 [www.tcr-qatar.com](http://www.tcr-qatar.com)

☎ +974 44354768

## OUR GLOBAL OFFICES



Mumbai



Baroda



TCR Arabia