



PARESH HARIBHAKTI

Founder & Managing Director, TCR Advanced Engineering

Chief Metallurgist & Global Technical Consultant, TCR Group

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30+

YEARS IN REFINERY &
PIPELINE INTEGRITY

10,000+

ROOT-CAUSE FAILURE
INVESTIGATIONS

190

ENGINEERS &
SCIENTISTS LED

1,800+

CLIENT
ORGANISATIONS
WORLDWIDE

EXECUTIVE SUMMARY

Paresh Haribhakti is a distinguished metallurgist with more than three decades of specialised expertise in **refinery equipment life assessment**, pipeline integrity, corrosion engineering, and failure investigation across the oil & gas, petrochemical, refinery, fertilizer, and power sectors. As Founder & Managing Director of TCR Advanced Engineering, and Chief Metallurgist & Global Technical Consultant to the TCR Group, he leads a team of nearly 190 engineers and scientists delivering fitness-for-service, remaining-life assessment, and mechanical integrity solutions to global asset-intensive industries. Backed by over 500 years of cumulative metallurgical and engineering experience and a client base exceeding 1,800 organisations worldwide, TCR Advanced holds NABL ISO/IEC 17025 and Nadcap AC7101 accreditations for materials testing.

Renowned for his scientific approach to solving complex integrity challenges, Paresh has personally led and supervised over 10,000 root-cause failure investigations, spanning refinery reactors, heat exchangers, boilers, reformer tubes, storage tanks, cross-country transmission pipelines, sour-service degradation, weld integrity, and fitness-for-service evaluations to API 579 / ASME FFS1. His experience covers the full lifecycle of refinery and pipeline assets — materials selection, welding qualification, construction quality control, commissioning failures, AC/DC interference corrosion, RBI-driven inspection planning, and long-term asset integrity management. He has developed a cloud-based Asset Integrity Management Platform aligned with API 580/581 risk-based inspection frameworks, enabling operators to enhance uptime, optimise inspection intervals, and minimise operational risk across refineries, transmission pipelines, offshore structures, and critical rotating equipment.

An accomplished author and thought leader, Paresh wrote *"Failure Investigation of Boiler Tubes: A Comprehensive Approach"*, published by ASM International (USA), and contributed a chapter to the ASM Handbook, Volume 11A. He is a pioneer of robotic NDT inspection (ARTiS), IoT-enabled metallographic replication (INSIPOL-2000), and AI-driven microstructure interpretation (MiC) — technologies now advancing predictive maintenance for refinery pressure systems, pipelines, and rotating machinery worldwide.

AREAS OF EXPERTISE

REFINERY EQUIPMENT LIFE ASSESSMENT

FITNESS FOR SERVICE (API 579 / FFS1)

REMAINING LIFE ASSESSMENT

CROSS-COUNTRY PIPELINE INTEGRITY

ROOT-CAUSE FAILURE INVESTIGATION

CORROSION PREVENTION & METALLURGY

BOILER TUBE / PRESSURE PARTS

APPLIED RESEARCH FOR MATERIALS SELECTION

EXPERIENCE

Founder & Managing Director

1999 – Present

TCR Advanced Engineering Pvt. Ltd.

Acclaimed as a one-stop solution provider for plant-related issues, TCR Advanced has worked with prestigious clients including Reliance, Saudi Aramco, SABIC, GE, Shell, QAFCO, QCHEM, KOC, Halliburton, OMIFCO, Godrej, and Unilever on complex metallurgical challenges and failure analysis assignments.

- Lead consultant for Reliance Industries at Asia's largest grass-root refinery, Jamnagar — investigated the VGO-HT2 crude unit fire, assessing metallurgical integrity of pipelines, flanges, heat exchangers, and reactors.
- Directed the complete health assessment of a relocated hydrogen plant for Godrej Industries (England to Valia, Gujarat).
- Led the fitness-for-service assessment of a refinery isomerization reactor per API 579 / ASME FFS1, delivering a direct cost saving of over USD 15 million.
- Contributed to a detailed study of the outer shield of the nuclear reactor for the ITER project, an eight-country consortium headquartered in France.
- Built and leads a 190-strong team of metallurgists, corrosion scientists, NDT Level III technicians, fracture mechanics specialists, and software engineers, while maintaining ISO 17025 regulatory responsibilities; TCR is recognised as a "Well-Known" Lab by the Indian Boiler Regulator and delivered growth every year since inception.

Sr. Research Engineer

1990 – 1999

Gujarat State Fertilizer & Chemicals Ltd.

Troubleshooting metallurgist responsible for failure investigation and remaining life assessment.

REFINERY & PIPELINE LIFE ASSESSMENT — NOTABLE PROJECTS

- **Reliance Industries, Jamnagar** — metallurgical damage assessment at Asia's largest grass-root refinery during the VGO-HT2 fire incident; RLA study at the Patalganga plant; fitness-for-service assessment of the isomerization reactor and VGO reactor/exchanger.
- **Saudi Aramco, KSA** — RO plant corrosion investigation including inlet flange failure of a furnace reactor, and RLA of furnace tubes using the Omega method per API 579.
- **SABIC, KSA** — failure investigation, RLA, and FFS assignments for high-pressure, high-temperature refinery components.
- **OMIFCO, Oman** — fertilizer plant component assessments including reactor outlet lines, gasket failures, and reformer tube failure investigation.
- **QAFCO, Qatar** — RLA, failure investigation, and condition assessment of high-pressure, high-temperature components at the world's largest integrated fertilizer plant, including on-site repair decisions.
- **Pemex, Mexico & Natore, Nigeria** — reformer tube life assessment using ARTiS robotic NDT; ammonia storage tank failure investigation, Nigeria.
- **Kuwait Cement Company & Shell Gas Terminal, Sri Lanka** — ball mill NDT assessment; on-site plant evaluation.
- **Gujarat State Fertilizers & Chemicals** — repair weld solution for a used Incoloy 800H ammonia plant header, India's largest fertilizer and petrochemical complex.
- **Hindustan Lever / Bangladesh Lever** — remaining life assessment of power and utility boilers and package boilers.
- Marine corrosion consulting for underwater and metallic structures at seashores, dams, bridges, and sea-transport components; crevice corrosion and electrochemical study for ITER-India; material selection for corrosion service at Solvay.

SELECTED CROSS-COUNTRY PIPELINE INTEGRITY & RCA PROJECTS

- **L&T Hydrocarbon Engineering Ltd.** — failure and FFS assessment for the ONGC 42" to 36" interconnecting pipeline per API 579, including defect characterization and life estimation.
- **BG Exploration & Production India Ltd.** — root cause investigation of PGC#3 HPC liquid & PE riser line failures, including service-induced degradation assessment.
- **Bharat Petroleum Corporation Ltd., Odisha** — failure analysis of two 90° elbows in the SV02 bypass line, including internal corrosion assessment.
- **GAIL (India) Ltd., Bangalore** — metallurgical investigation of a damaged 30" DBPL pipeline section, assessing thinning, defect morphology, and remaining life.

INNOVATIONS

AiOM — Asset Integrity Optimization & Management

A cloud-based platform combining fracture mechanics and corrosion damage-mechanism expertise to raise plant productivity — tracking availability, reliability, downtime, maintenance cost, and failure rates against API 580/581 RBI frameworks.

INSIPOL-2000

A tool that reduces human error in in-situ metallographic replication, speeding decision-making while preparing large numbers of on-site microstructures.

ARTiS

An indigenously developed robotic crawler for ultrasonic inspection of reformer tubes, capturing attenuation levels, tube diameter, and bowing angle in digital format.

Microstructure Characterizer (MiC)

AI-driven image processing software used by research labs worldwide, including National Oilwell Varco (USA), to characterise grain size, coating thickness, and phase composition.

EVOLVE BY TCR

Principal expert at Evolve, TCR Advanced's training school, where Paresh mentors the next generation of QA/QC professionals in asset integrity management, working alongside industry experts to train and guide future leaders of the industrial inspection field.

QUALIFICATION

Maharaja Sayajirao University of Baroda, Vadodara

Master of Engineering (ME), Material Technology

Bachelor of Engineering (BE), Metallurgical Engineering

RECOGNITION & AWARDS

- **IIM-KK Award (2016)** — Indian Institute of Metals, Baroda Chapter, for outstanding, selfless & meritorious contribution to the metallurgical profession in Gujarat.
- Appreciation from Jeddah Refinery for a presentation on "Fitness For Service" (2015); HADEED, SABIC KSA, for the Reliability Campaign (2016); SABIC STM 12 (2016).
- Invited-speaker recognitions from Saudi Aramco (Corrosion Awareness Day, Inspection Technical Exchange, GO Inspection & Corrosion Forum), NACE Middle East & West Africa, ASNT sections, ASM International, and the Indian Institute of Metals — spanning 2007 to 2019.
- Joint workshop partnership with IIM on Remaining Life Assessment of Power & Process Boilers (2013).

TECHNICAL PAPERS & PRESENTATIONS (SELECTED)

- FLEX India Conference; Bharat Corrosion Meet; ASNT India NDT Network Event, Vadodara; SPE India, Vadodara Chapter — 2026
- Technical Session, Indorama, Nigeria; FGI, Vadodara — 2026
- 12th National Conference on Boiler & Steam Systems — 2019; Two Day Symposium on Corrosion & Its Control, SCES — 2018; Indian Society for Non-Destructive Testing — 2018; SME Meta-Fiesta, MSU Baroda — 2017
- SABIC STM 12 & HADEED Reliability Campaign, SABIC KSA — 2016; Saudi Aramco Corrosion Awareness Day — 2014
- Indian Institute of Metals — 2013; 1st NACE Jubail Industrial Forum — 2011; NACE West Africa, Dhahran — 2010; ASM Heat Treat Show — 2010; Saudi Aramco GO Inspection & Corrosion Forum — 2010; 13th Middle East Corrosion Conference, NACE — 2010
- 5th Middle East NDT Conference, ASNT — 2009; 6th International Conference, MICMEP — 2009; Saudi Aramco Inspection Technical Meeting — 2008; 4th Middle East Conference, ASNT — 2007

PUBLICATIONS

- "Failure Investigation of Boiler Tube – A Comprehensive Approach" — American Society for Metals, 2019
- ASM Failure Investigation Handbook, Vol. 11A — chapter on "Failures of Boilers and Related Equipment," 2021
- "Optimizing Tube Life" — World Fertilizer Magazine, 2019
- "Knowledge Based Life Management of Boilers" — SteamTech-2018; "Preventive Approach for Failure Free Boilers" — SteamTech-2016
- "An Integrated Approach for RLA of Reformer Tubes by NDT (ARTiS)" — APCNDT 2013; "Boiler Tube Failure, Root Cause Investigation & Mitigation: Case Studies" — SteamTech-2014
- "Corrosion Failures in Water-Wall Tubes" — Corcon-2014; "Material Testing and Characterization" — ASM, 2014
- "Fitness For Service: Using NDT and Inspection" — with Ketan Upadhyay, Jaidev Patel & V.K. Bafna, 14th Asia Pacific Conference on NDT, 2013
- "In-situ Metallography for Plant Health Assessment and Failure Investigation" — MENDT-2007

TRAINING IMPARTED

- Risk Based Inspection (RBI) in process, petrochemical, oil & gas plants
- Heat exchanger inspection, condition assessment, FFS & failure investigation
- Reformer & boiler tube damage mechanisms, failure investigation, RLA
- Pressure vessel mechanical design per ASME PV Codes
- Failure prevention, repairs, and life enhancement of piping, vessels & tanks
- REAC (Reactor Effluent Air Cooler): damage mechanisms, corrosion, FFS & inspection
- Hydrogen damage for industries: asset integrity & damage mechanism
- **Asset Integrity Management for Cross-Country Pipelines**
- Fitness for service per API 579 and ASME FFS1
- Damage mechanisms and life management of gas & steam turbine components
- T-91/P-91 high-pressure welding technology; welding metallurgy for engineers
- Damage mechanisms for static equipment in refineries and process industries
- Low temperature service: metal properties, manufacturing & testing
- Localized & intergranular corrosion of austenitic stainless steel
- High temperature degradation of industrial components
- Asset integrity management for process industries