

MAJOR PROJECTS

Each one of the below listed jobs were part of a unique and interesting challenge to our teams at TCR Engineering Services. TCR's clients saw a measurable value and hence, companies were able to bring the right products/services to the market, at the right time and at the right cost. TCR's noteworthy projects include:

FAILURE ANALYSIS PROJECTS



Schlumberger Oilfield Services
Failure Investigation (FI) of Mandrel Bypass of Equalizer Sub.



GAIL India
Root Cause Analysis at a Lpg Recovery Plant



Wartsila, Finland
Failure Investigation of Crank Shaft



Man Industries India
FI of Mechanical Expander Pull Rod



Thermax
Failure Analysis of Cupro Nickel Tubing of Chiller Unit



Siemens Ltd.
Failure Investigation of ESV Sleeve DN 200



Weir Mineral India
Root Cause Analysis of Shaft Failures in Vertical Pumps (Cantilever Design)



Hydril Jindal
Failure Investigation of Die Cracking In Swaging Process (Cold Forming Process)



Sterlite Industries India Ltd
Volute Casing, Crane Hook / Pump Failure Investigation



Welspun Gujarat Sthal Rohen Ltd
Failure Investigation of Api 5l Psl 2 X60, (Pipe No: 3612) Line Pipe Failed During Hydro Test at site



Torrent Power Ltd.
Failure Investigation Of Blade of Lp Rotor Stage 4A Of ESM 110MW Unit



Oil India Ltd.
Corrosion Evaluation of Oil Well Tubing through Root Cause Failure Investigation



Caparo Engg P. Ltd
FI of Axel A Rear Suspension Of Car



Munjial Auto Ltd.
FI of Exhaust Muffler KTPA



Godrej Industries Ltd.
Failure Investigation of Reformer Tubes



ALSTOM Projects
Failure Investigation of High Density Balancing Weight



Hindustan Petroleum Corporation
Failure Investigation Of Radiant Heater Outlet Header Cap



Avtec Ltd.
Failure Investigation Of Crank Shaft Of Diesel Car Engine.



Bombardier Transportation India
Failure Investigation Of Notching Spring Of Tap Changer



Ratnamani Metals & Tubes Ltd.
Failure Investigation Duplex R 2205 (50.8 X 2.13 Mm) Tube Failed During Hydro-Forming Expansion

POSITIVE MATERIAL IDENTIFICATION



Kuwait Oil Company
2 crews of PMI using portable XRF and portable Optical Emission spectroscopy



Indian Oil Corporation
4 PMI crews deployed for a period of 2 years using portable XRF spectrometers



Hyundai Heavy Industries
Portable XRF on Pipe Joints



Bharat Petroleum
One PMI crew for identifying incoming materials at site



Cochin Refinery
PMI for Stock sorting purposes



Larsen & Toubro, Mumbai | Godrej & Boyce Mfg., Mumbai | Oswal Petro Chemicals | Tyco Sanmar, Tamil Nadu | Virgo valves, Pune | Hawai valves | Endress+Hauser india pvt ltd, Mumbai
Bombay Fluid / Swagelok
Ongoing on-call PMI services provided using portable XRF spectrometers



Reliance Industries
Detection of Carbon using portable Optical Emission Spectroscopy



Petronas, Malaysia
PMI crew on assignment on behalf of L&T, India

METALLOGRAPHY ASSIGNMENTS



Constar, USA
SEM Analysis of Plastic samples taken on 3-4 KX, 20 KV voltage magnification



Biosync Scientific Pvt. Ltd.
Measurement of drug Coating layer on Drug coated stent used in Angioplasty



NDT-CCS
Evaluation of Metallographic Replicas



Godrej Industries Ltd.
Remaining life assessment was carried out through Insitu Metallography route



Reliance
Over 1200 metallographic replicas created and analyzed to evaluate post fire damage



Lupin Ltd.
Remaining life assessment of fermentor vessel was carried out by Evaluating microstructure at critical locations



Zamil Group
Micro Hardness Testing



Gujarat Power Generation Co. Ltd. Bharuch
Microstructure evaluation at critical locations of HRSG Unit



Alsom
SEM and EDAX Analysis



Massod John Brown, Dubai
SEM analysis to characterize the carbide morphology types in cobalt based alloys such as FXS 414



National Thermal Power Corporation
In situ Metallography conducted on critical components of turbine.

METALLOGRAPHY ASSIGNMENTS (CONT.)



IFFCO
Insitu Metallography for evaluation degradation of microstructure of ammonia plant for remaining life assessment.



IPCL
Insitu metallography at critical locations of naphtha plant



L & T
Insitu Metallography for microstructure evaluation after various manufacturing stages of critical components



Bharat Petroleum Corporation Ltd.
Damage assessment of Scrubber column and condenser tubes.



Zuari Industries Ltd.
Metallography Work Conducted On Various Critical Locations Of Process Steam Supply Heater Outlet Piping



Hindustan Petroleum Corporation Ltd.
Insitu Metallography of reformer tubes



Suzlon Windfarm Services Ltd.
Damage assessment of windmill caught in accidental fire through insitu Metallography route



Tata Power Company
Insitu Metallography work conducted on critical locations of Gas Turbine Unit -7 during outage.



Elecon Engineering Ltd.
Insitu Metallography at various locations of large size Gear



Gulbrandsen Limited
Damage assessment through Insitu Metallography route on ammonium chloride anhydrous vessel



Nagarjuna Fertilisers & Chemical Ltd.
Insitu Metallography of ammonia plant



United Phosphorus Ltd.
Insitu Metallography of evaporator support to assess the stress corrosion cracking



Indian Oil Corporation Ltd.
Insitu Metallography of FCC plant



Gujarat State Fertilizer Company
Insitu-metallography work on Reducer of Outlet Bottom Header of Reformer at Ammonia – IV Plant



Tata Chemicals Ltd.
Various critical locations of Urea Plant



Essar Steel Ltd.
Insitu Metallography on cooling coil of furnace.

FATIGUE & FRACTURE TOUGHNESS



Naval Materials Research Laboratory, India
Crack tip opening displacement testing as per client Requirement



Jindal Steel & Power Ltd., India
Fatigue crack growth rate test as per ISO 12108



Amsafe Bridport, Sri Lanka
Fatigue testing of Bulk-hold baggage nuts (Belts) as per client Requirement

REMAINING LIFE ASSESSMENTS



Torrent Power
Remaining Life Assessment and Investigation of Blade failed from root for LP Rotor stage 4A of E-Station 110MW Unit



Zuari Industries
Remaining life assessment of steam pipe line and surface cracks.



Alstom Power
RLA study through Insitu-metallography work of critical components of 120MW Turbine at MSEB-KTPS; Koradi



Asha Cellulose
Health assessment work on R-1 Reactor at Mech Engineering; Valsad



Vanakbori Thermal Power station
RLA Study of various components of Boiler No.- 2



Unilever Bangladesh
RLA (Visual, MPI, DP, Metallography, Hardness & Thickness Survey) on critical locations of Package Boiler at Unilever Bangladesh Ltd; Chittagong, Bangladesh



Atul Industries Vapi, Gujarat
– RLA of Chlorine storage tank
– RLA Study (Insitu-metallography, MPI & Hardness) on Old Autoclave – G 2101



Alembic Limited, Vadodara
RLA of fermentor



Godrej, Valia, Gujarat
– Remaining Life Assessment of Used N9 Pipe for Alcohol Synthesis Plant
– Remaining Life Assessment Of Alcohol Synthesis Plant



Hindustan Unilever
RLA study of critical components of MP Boiler No.- 1 (G-122) at Kundain Ind., Goa
RLA study of critical components of Boiler No.- 1 at V.D.L. at Khed, Chiplun Location
– Insitu-metallography work on various components of Boiler No.- 1 (UP – 4702) at Orai Location
– RLA study of various pressure components of Stein Mullar Boiler No.- MR 6495 at Sewri



Gujarat Fluoro-Chemicals Ltd.
– Metallurgical Assessment of CFC Reactor R-501 and Column C-513 at Formosa Plastics company Taiwan Roc
– Condition Assessment work (V.E, metallography, U.T, MPI, Hardness & Thickness Survey) on AHF Bullet: V-31B
– Health assessment work on R-201 Main Reactor CFC plant [Metallography & hardness] at Alfa-laval; Pune



IOCL
Health Assessment Study of C-0.5Mo Piping in Hydrogen Unit-I Plant.



Siemens Ltd
Remaining Life assessment of turbine.



Jaghadia Copper
Condition assessment of landle furnac



Aarti Industries
RLA of turbine

CORROSION DETECTION

	Caterpillar, USA Weight loss corrosion test for over 35 sampl.		Jutal, China SSC test based on Sinopec approved standard(closely adopted to NACE guidelines)
	KPIOS, Kuwait Hydrogen Induced Cracking Test as per NACE standard for over 15 plate samples		Xalloy, Thailand Chloride Stress Corrosion Cracking, Intergranular Corrosion as per ASTM A262
	Enerflex Canada HIC and SSC corrosion tests as per NACE TM 0177 and TM 0284 for over 20 samples		Johnson Screens, Australia Weigh Loss Corrosion Tests
	Ecolab Canada Salt Spray test at a Coca Cola plant		Walchandnagar Industries HIC and SSC Testing
	GMMOS, UAE HIC and SSC testing on over 15 samples		Godrej, Mumbai Stress Oriented Hydrogen Induced Corrosion as per NACE 0177 method D
	Larsen and Toubro (L&T) - HIC testing as per NACE TM 0284 on an ongoing basis and Intergranular Corrosion of Aluminium Alloys by Mass Loss After Exposure to Nitric Acid As per ASTM G67		Bay-Forge Pvt. Ltd., India Visual Assessment of Exfoliation Corrosion Susceptibility of Aluminum Alloys as per ASTM G66

NON-DESTRUCTIVE TESTING (NDT)

	ONGC, Iran 40 team member crew deployed for shutdown activity including conventional NDT, scaffolding, and shutdown project management		KOC, Kuwait Automated UT using ToFD for Storage Tanks based on API 650 Appendix U. Project undertaken with HHI as EPC contractor
	NPCIL, Kota Shutdown Crew deployed for NDT including 20 NDT Level II and a NDT Level III person		Tekfen, KSA Automated UT using ToFD based on Code Case 181 undertaken at Aramco's PetroRabigh site
	Unilever Bangladesh Ferrite Survey, UT Thickness Measurement and Hardness Checking		Mass Construction, India Conventional Radiography by using X-ray source based on ASME SEC VIII Div. 1 Conventional Radiography by using Gamma ray source by API 1104
	Indian Naval Shipping NDT and RLA Study of LPG Tanker		NMRL, Mumbai NDT for WPS as per ASME SEC IX
	Several projects for EIL and L&T Ongoing daily callouts for UT, DP, MP, PT, Ferrite Measurement, Portable Hardness		

THIRD PARTY INSPECTION SERVICES

	Saudi Chemanol Third party inspection at various locations (Kolkatta, Tarapur & Pune) as per Client provided ITP/QAP		Elliott Company, USA Factory Audit and QA/QC inspection on behalf of the USA based company at their supplier site in western India for a 3-year duration project
	Komline Sanderson, USA AWS Welding Inspector as well as QA/QC Personnel deployed at a vendor site in India		Uniflex Cables, Kuwait Inspection and Witness of Goods at a supplier site in India
	EMC Sp. Z.o.o., Poland QA/QC inspection and Pre-shipment loading audit of electric light bulbs at a vendor site in Mysore, India		Bloxwich, UK QA/QC inspection with daily photographs and status reports advising client of vendor's progress and quality status
	Permapipe, UAE 6-Month duration project for QA/QC inspection including dimensional verification and specification compliance of insulation material used in refinery piping		Metpost, UK Inspection of fabrication and Factory Audit of casting and forging companies in India
	Aventech, Candada Factory Audit and Sourcing Assistance of Casting Suppliers		American Industrial Supply, USA Third party Inspection, Stamp Transfer and Shipment Audit
	Flowserve, UK QA/QC inspection at Audco in Chennai on an ongoing basis		

RoHS COMPLIANCE SERVICES

	Sys Concept, Canada Detection of RoHS restricted elements using the screening and verification methods		Parveen Industries RoHS compliance for 28 plastic samples
	Birla Copper Test of Lead content in samples		Godrej Lawkim Group RoHS testing on an ongoing basis for over 600 samples
	Emerson Climate Technologies RoHS testing on an ongoing basis for over 500 samples		