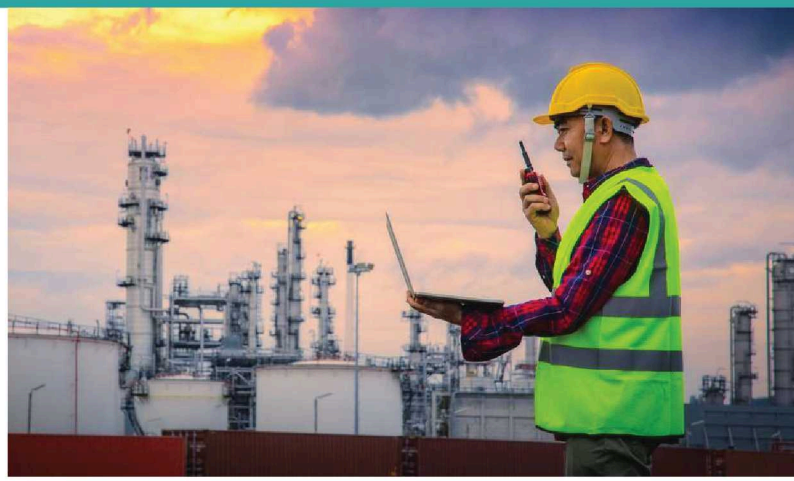
EVOLVE by TCR
Innovate your skillset, Empower the mind

TCR ADVANCED

INTEGERITY DESPITE DEFECTS

2-DAY TRAINING PROGRAM

ENSURING EQUIPMENT INTEGRITY: FITNESS-FOR-SERVICE (FFS) ASSESSMENTS AS PER API 579 / ASME FFS-1

Fitness-For-Service (FFS) assessments are required through engineering analysis to demonstrate the structural integrity of components containing flaw or damages. The guidelines provided in API 579/ ASME FFS-1 are used to make run-repair-replace decisions of pressurised components after inspection, if they can continue to operate safely. Recommended practice as presented supplement and augment requirements and decisions while implementing inspections as per API 510, API 570 and API 653.

The course will cover situations encountered in pressure vessels, heat exchangers, tanks and connected piping in refining and petrochemical industry.

Why Is FFS Training Important?

FFS study is crucial in process industries to evaluate the integrity of damaged or corroded equipment and ensure safe continued operation. It reduces maintenance costs by avoiding premature replacements and supports compliance with standards like API 579. FFS also aids in making informed decisions on repair, inspection, or life extension.

FFS A New Era of Engineering Judgement

Key Benefits of FFS Training:

FFS training helps understand the safety risks posed by defects and damages found during inspections. It includes real-world case histories to highlight failures, timely remedial actions, and remaining life estimation.
The training supports experienced professionals in updating their knowledge on current integrity evaluation practices. It also provides foundational orientation for engineers and technologists from diverse technical backgrounds. Participants gain insight into equipment damage mechanisms, detection methods, and defect acceptance criteria.

Program Overview : Course Structure

Day 1 : Understanding of FFS Principles & Damage Mechanism -

- Understanding Damage Mechanisms and Their Impact on Equipment Integrity (Corrosion, fatigue, creep, SCC, and inspection planning)
- General and Local Metal Loss Assessment Techniques (Applicability, data requirements, acceptance criteria)
- Pitting Corrosion and Crack-Like Flaws: FFS Approach and Life Estimation (Critical flaw assessments and case-based discussions)
- Shell Distortions and Weld-related Degradations (Evaluation, inspection methods, and remaining life assessment)

Day 2 : Practical Application of FFS in the Process Plants -

- Role of Material Properties in FFS – Strength, Toughness, and Degradation (Fracture toughness, Charpy data interpretation, service degradation)
- Crack Growth Phenomena and Damage Evaluation Under Cyclic and Creep Conditions (Fatigue, SCC, creep mechanisms, and crack growth rate calculations)
- Case Studies: Failures from Field – From Detection to Mitigation (Pressure vessels, reactors, heat exchangers, tanks)
- Mock Test and Discussion on Practical Plant Scenarios (Interactive Q&A and assessment)

Course Material and Resources

Participants will receive comprehensive course material including:

- Presentation Slides and Handouts.
- A training kit and certification.

Faculties

Mr. Paresh Haribhakti, MD

- He holds a post-graduate degree in Materials Technology from M.S. University, giving him a strong foundation in metallurgy and materials science. In his leadership role at TCR Advanced Engineering Services, he has gained extensive experience in metallurgical engineering, solving over 9,500 + industrial challenges, with expertise in risk mitigation and management. Paresh is the author of Failure Investigation of Boiler Tubes: A
- Comprehensive Approach, published by ASM International, USA. He actively promotes failure prevention and a predictive approach across industries, and regularly contributes to global conferences and leading metallurgical journals. Recognized for his expertise in damage mechanisms across oil & gas, refineries, petrochemicals, power, and fertilizers, he provides advanced insights into boiler tube failures and analysis.

Mr. Ketan Upadhyaya, GM (Reliability), TCR Advanced Enginering

- BE in Metallurgical engineering, PGD in computer science. He has experience of 35+ years in the field of NDE, Acoustic emission techniques, Vibration measurement and signature analysis, Failure Investigations, microstructure interpretation, Scanning electron microscopy and digital imaging system
- He is a qualified level II for Acoustic Emission testing (IISC Bangalore), Vibration Analyst VT-II (Entec IRD) and Ultrasonic Flaw Detection (EEC Mumbai) techniques. He has expertise in Engineering Critical Analysis, high-temperature degradation of materials, Remaining Life Assessment (RLA), and Fitness-for-Service (FFS) evaluations. He has investigated over 1,000 failure cases related to petrochemical and oil & gas plants.

Mr. Nikhil Sabhya

NDT Level III expert at TCR, specializes in ultrasonic evaluation of hydrogen-induced damage using TOFD, PAUT, and backscatter techniques. He brings practical knowledge of implementing ASME Section V-compliant testing strategies and has led inspection campaigns on high-pressure equipment operating above Nelson Curve limits. Nikhil will present real-case UT scans and teach the art of interpreting signal fidelity to separate genuine flaws from false indications. His role is crucial in ensuring that the metallurgical findings are seamlessly integrated with inspection data for comprehensive integrity assessments.

Who Should Attend This Program?

This two-day training program is designed for professionals that handle integrity and reliability of plant assets. It is particularly suited for:

- Equipment Design Engineers & Plant Managers.
- Inspection, QA/QC, and Safety Engineers
- Operation and Maintenance Engineers.
- Asset Integrity and Reliability. Professionals.
- Fresh graduates or technologists aiming to understand equipment damage evaluation.

Registration Fee: Rs. 15,000/- +18% GST per candidate.

10% Discount on total amount of invoice for 03 or more nominations from the same organization.

For NFET/ RTGS/ Bank transfer:
Account No: 05730400000034
IFSC: BARBOINDMAK (5th letter is zero)
Bank: BOB, Makarpura Branch
Merchant Name : TCR ADVANCED ENGINEERING PVT LTD
UPI ID : tcrad93762@barodampay

QR code for payment