

API 579-1/ASME FFS-1 Fitness- For-Service Training

COURSE CONTENT

GET IN TOUCH



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About Multisoft

Train yourself with the best and develop valuable in-demand skills with Multisoft Systems. A leading certification training provider, Multisoft collaborates with top technologies to bring world-class one-on-one and certification trainings. With the goal to empower professionals and business across the globe, we offer more than 1500 training courses, which are delivered by Multisoft's global subject matter experts. We offer tailored corporate training; project Based Training, comprehensive learning solution with lifetime e-learning access, after training support and globally recognized training certificates.

About Course

API 579-1/ASME FFS-1 Fitness-For-Service training by Multisoft Systems is designed to equip professionals with the knowledge and practical skills required to assess the structural integrity and remaining life of pressure equipment. This globally recognized standard provides engineering procedures for evaluating equipment that contains flaws or damage, helping organizations make informed decisions about repair, replacement, or continued operation.

Module 1: Introduction to Fitness-For-Service (FFS)

- ✓ Overview of Fitness-For-Service Philosophy
- ✓ Purpose and Benefits of FFS Assessments
- ✓ Scope and Limitations of API 579-1 / ASME FFS-1
- ✓ Difference Between FFS and Design-by-Rule
- ✓ Typical Equipment Covered (Pressure Vessels, Piping, Tanks)
- ✓ When and Why FFS Assessments Are Required?

Module 2: API 579-1 / ASME FFS-1 Standard Framework

- ✓ Structure of the API 579-1 / ASME FFS-1 Standard
- ✓ Overview of Parts 1 to 14
- ✓ Assessment Levels – Level 1, Level 2, and Level 3
- ✓ Inputs Required for an FFS Assessment
- ✓ Inspection Data and Damage Characterization
- ✓ Documentation and Reporting Requirements

Module 3: Brittle Fracture Assessment

- ✓ Understanding Brittle Fracture Mechanisms
- ✓ Material Toughness and Temperature Effects
- ✓ Minimum Safe Operating Temperature (MSOT)
- ✓ Level 1 Brittle Fracture Assessment Procedure
- ✓ Level 2 Brittle Fracture Assessment Overview
- ✓ Practical Examples and Case Discussions

Module 4: General Metal Loss Assessment

- ✓ Causes of General Metal Loss (Corrosion, Erosion)
- ✓ Inspection Methods for Thickness Measurement
- ✓ Remaining Strength Factor (RSF) Concept
- ✓ Level 1 General Metal Loss Assessment

- ✓ Level 2 General Metal Loss Assessment
- ✓ Acceptance Criteria and Remaining Life Estimation

Module 5: Local Metal Loss

- ✓ Identification of Localized Corrosion
- ✓ Difference Between General and Local Metal Loss
- ✓ Data Requirements for Local Metal Loss
- ✓ Level 1 Assessment Procedure
- ✓ Level 2 Assessment Procedure
- ✓ Case Studies and Engineering Examples

Module 6: Pitting Corrosion

- ✓ Characteristics of Pitting Corrosion
- ✓ Measurement and Pit Density Evaluation
- ✓ Pit Depth and Diameter Considerations
- ✓ Level 1 Pitting Assessment
- ✓ Level 2 Pitting Assessment
- ✓ Practical Applications and Examples

Module 7: Crack-Like Flaws

- ✓ Types of Crack-Like Flaws
- ✓ Introduction to Fracture Mechanics Concepts
- ✓ Stress Intensity Factor (K) Fundamentals
- ✓ Level 1 Crack-Like Flaw Assessment
- ✓ Level 2 Crack-Like Flaw Assessment
- ✓ Engineering Examples and Problem Solving

Module 8: Hydrogen Damage

- ✓ Overview of Hydrogen Damage Mechanisms

- ✓ Hydrogen Blistering
- ✓ Hydrogen-Induced Cracking (HIC)
- ✓ Stress-Oriented Hydrogen-Induced Cracking (SOHIC)
- ✓ Inspection and Damage Identification
- ✓ Acceptance Criteria and Assessment Guidance

Module 9: Weld Misalignment and Distortion Assessment

- ✓ Types of Weld Misalignment
- ✓ Shell Distortions and Out-of-Roundness
- ✓ Causes and Impact on Structural Integrity
- ✓ Inspection and Measurement Techniques
- ✓ Assessment Methodology per API 579-1
- ✓ Practical Evaluation Examples

Module 10: Creep Damage Assessment

- ✓ Fundamentals of Creep Damage
- ✓ Materials Susceptible to Creep
- ✓ Operating Conditions Influencing Creep
- ✓ Creep Damage Identification
- ✓ Remaining Life Estimation
- ✓ Assessment Examples

Module 11: Fire Damage Assessment

- ✓ Effects of Fire Exposure on Materials
- ✓ Identification of Fire Damage
- ✓ Metallurgical Changes Due to Fire
- ✓ Inspection and Data Collection
- ✓ Fitness-For-Service Evaluation Approach
- ✓ Case Discussions

Module 12: Dents, Gouges, and Mechanical Damage

- ✓ Types of Mechanical Damage
- ✓ Dent Severity and Shape Considerations
- ✓ Gouges and Dent-Gouge Combinations
- ✓ Inspection Requirements
- ✓ Assessment and Acceptance Criteria
- ✓ Engineering Examples

Module 13: Lamination Assessment

- ✓ Causes of Material Laminations
- ✓ Detection Methods
- ✓ Classification of Laminations
- ✓ Structural Impact Evaluation
- ✓ Assessment Procedures

Module 14: Integrated Case Studies and Problem Solving

- ✓ End-to-End FFS Assessment Workflow
- ✓ Multi-Damage Scenario Evaluations
- ✓ Selection of Appropriate Assessment Levels
- ✓ Interpretation of Results
- ✓ Decision-Making: Repair, Monitor, or Replace
- ✓ Course Wrap-Up and Key Takeaways