# *API 579-1/ASME FFS-1 course content*

## *DAY ONE*

## 1 Overview and Opportunities for FFS documents

## 2 Introduction to API 579-1/ASME FFS-1

## 3 FFS Assessment Procedures

- 3.1 Applicability and limitations of the FFS assessment procedures
- 3.2 Data requirements
- 3.3 Acceptance Techniques and Acceptance criteria
- 3.4 Remaining life evaluation
- 3.5 Remediation
- 3.6 In-service monitoring
- 3.7 Documentation
- 3.8 Example problems

## 4 Damage Mechanisms

- 4.1 Introduction
- 4.2 The need to identify damage mechanisms
- 4.3 Assessing potential damage mechanisms
- 4.4 Damage types
- 4.5 Sources of information on damage types
- 4.6 Inspection techniques for damage mechanics with focus on flaw characterization

***DAY TWO***

## 7 Assessment of General Metal Loss

- 7.1 Applicability and limitations of the FFS assessment procedures
- 7.2 Data requirements
- 7.3 Acceptance Techniques and Acceptance criteria
- 7.4 Remaining life evaluation
- 7.5 Remediation
- 7.6 In-service monitoring
- 7.7 Documentation
- 7.8 Example problems

## 8 Assessment of Localised Metal Loss

- 8.1 Applicability and limitations of the FFS assessment procedures
- 8.2 Data requirements
- 8.3 Acceptance Techniques and Acceptance criteria
- 8.4 Remaining life evaluation
- 8.5 Remediation
- 8.6 In-service monitoring
- 8.7 Documentation
- 8.8 Example problems

# 11 Assessment of Weld Misalignment and Shell Distortions

## 11.1 Applicability and limitations of the FFS assessment procedures

## 11.2 Data requirements

## 11.3 Acceptance Techniques and Acceptance criteria

## 11.4 Remaining life evaluation

## 11.5 Remediation

## 11.6 In-service monitoring

## 11.7 Documentation

## 11.8 Example problems

***DAY THREE***

## 12 Assessment of Crack-Like Flaws

- **12.1 Applicability and limitations of the FFS assessment procedures**
- **12.2 Data requirements**
- **12.3 Acceptance Techniques and Acceptance criteria**
- **12.4 Remaining life evaluation**
- **12.5 Remediation**
- **12.6 In-service monitoring**
- **12.7 Documentation**
- **12.8 Example problems**

## 13 Assessment of Creep Damage and Remaining Life

- **13.1 Applicability and limitations of the FFS assessment procedures**
- **13.2 Data requirements**
- **13.3 Acceptance Techniques and Acceptance criteria**
- **13.4 Remaining life evaluation**
- **13.5 Remediation**
- **13.6 In-service monitoring**
- **13.7 Documentation**
- **13.8 Example problems**

## 14 Assessment of Fire Damage

- **14.1 Applicability and limitations of the FFS assessment procedures**
- **14.2 Data requirements**

***DAY FOUR***

## 19 Introduction to ASME PCC-2 standard (Scope, Organization, and Intent)

- **19.1 Applicability and limitations of repair methods covered by ASME PCC-2**
- **19.2 Repair methods and techniques**
- **19.3 Welded Repairs**
- **19.4 Butt-Welded Insert Plates in Pressure Components**
- **19.5 Weld Overlay to Repair Internal Thinning**
- **19.6 Welded Leak Box Repair**
- **19.7 Full Encirclement Steel Reinforcing Sleeves for Piping**
- **19.8 Fillet Welded Patches**
- **19.9 Alternatives to Post weld Heat Treatment**
- **19.10 In-Service Welding Onto Carbon Steel Pressure Components or Pipelines, Weld Build-up, Weld Overlay, and Clad**
- **19.11 Restoration, Mechanical Repairs (Non-welding repairs)**
- **19.12 Mechanical Clamp Repair, Inspection and Repair of Shell and Tube Heat Exchangers, Mechanical repairs, with sealant.**
- **19.13 Non-metallic Composite Repair Systems**
- **19.14 Examination and Testing, Pressure and Tightness Testing of Piping and equipment,**
- **19.15 Non-destructive Examination in Lieu of Pressure Testing for Repairs and alterations**
- **19.16 Documentation and Records of repairs**
- **19.17 Real-world examples and case studies**