

## Course Content

**Title:** Metal Loss FFS Training Course

**Potential PDH:** 16

**Code:** BTT007

### Description:

The API-579/ASME FFS-1 and B31G Fitness for Service course provides theory and practical application of API-579/ASME FFS-1 methods for assessing the acceptability of equipment with metal loss. The Fitness-for-Service training provides direction for performing FFS assessments using procedures specifically prepared for pressurized equipment. For the topics covered in the training, example problems will be solved using hand calculations supplemented with BechtFFS software.

### Outline:

1. Introduction to Fitness-for-Service
  - Overview of API 579/ASME FFS-1
  - Scope and Objectives
  - Responsibilities in FFS
  - FFS Methods and Margins
  - Design Margins for New Equipment
  - Remaining Strength Factor
  - Margins for In-Service Equipment
  - Three Levels of FFS Analysis
2. General Metal Loss-PTR and CTP Approaches (API 579/ASME FFS Part 4)
  - Local vs General Thinning
  - Applicability and Limitations
  - Data Requirements
  - Level 1 and 2 Assessment
  - Remaining Life Assessment
3. Local Metal Loss (API 579/ASME FFS Part 5 and B31G)
  - Applicability and Limitations
  - Data Requirements
  - Level 1 and 2 Assessment
  - B31G Level 1 and Level 2 Remaining Strength Assessment
  - Remaining Life Assessment
  - Remediation
4. General Metal Loss Nozzles and Branch Connections(API 579/ASME FFS Part 4)
  - Applicability and Limitations
  - Data Requirements
  - Level 2 Assessment
  - Remaining Life Assessment
  - Remediation
5. Pitting Corrosion (API 579/ASME FFS Part 6)
  - Applicability and Limitations

## Course Content

- Level 1 Assessment
- Remaining Life Assessment
- Remediation

### Instructor:

Nadarajah ("Ranjan") Chithranjan, Ph.D, PE, career has spanned over 18 years of worldwide involvement in petrochemical industries for ExxonMobil Research and Engineering. Prior to joining Becht Engineering, he worked as a fixed equipment specialist at ExxonMobil Research and Engineering and he has worked in more than a dozen countries worldwide to solve complex mechanical plant problems as well as mechanical support for large scale projects. He has extensive knowledge in pressure vessels, piping, and storage tanks, design and maintenance codes. At ExxonMobil, he was the lead fitness for service specialist and he is very well versed with the fitness for service codes as well as linear and non-linear finite element methods to solve complicated plant problems. Ranjan was also the Mechanical Delayed Coker and Storage Tank subject matter expert at ExxonMobil Research and Engineering. He was a former member of API-650 Welded Steel Tank for Oil Storage and presently he is a member of the ASME Working Group on Section VIII, Division II, Design by Analysis and Working Group on Section VIII, Division II, High temperature design. He has more than twenty publications and two patents. Dr. Nadarajah received his PhD and Bachelors in Mechanical Engineering from the University of Strathclyde, Glasgow, United Kingdom.