ASME B31.4 Liquid Pipelines and ASME B31.8 Gas Pipelines

Potential PDH: 40

Description:

A five-day course that covers the requirements and practices of the oil and gas pipeline codes ASME B31.4 and ASME B31.8. The course explains the technical bases of the pipeline code requirements and their practical application to design, construction, operation, inspection and mechanical
integrity.

Outline:

1. Overview and Codes and Standards
   - Course Contents
   - Objectives
   - Historical Perspective
   - ASME B31 Pressure Piping Codes
   - Scope of ASME B31.4 and B31.8
   - ASME B31G and B31.8S Integrity Codes
   - ASME Pressure Vessels Codes
   - API Codes and Standards
   - Other Applicable Standards
   - Integrity Management Regulation

2. Fundamentals of Pipeline Engineering
   - Contents and Structure of ASME B31.4 and B31.8
   - System Design
   - Materials
   - Detailed Design
   - Procurement and Field Construction
   - Operation
   - Inspection, Maintenance and Repairs

3. Materials
   - Material Specifications
   - API 5L Line Pipe Specification

- Mechanical and Metallurgical Properties
- Seamless and Welded Pipe
- Fittings

4. Design
   - Design Loads
   - Pressure design
   - Weight Supports
   - Soil Loads and Subsidence
   - Thermal expansion and Contraction
   - Vibration
   - Pressure Transients and Hammer
   - Subsea Pipelines Waves and Currents
   - Subsea Pipelines External Pressure

5. Construction
   - Ditching
   - Bending
   - Welding Methods and Qualification
   - Welding on In-service Pipelines
   - Flange Joint Assembly
   - Non-Destructive Examination
   - Hydrotesting and Leak Testing

6. Integrity Management
   - General Introduction to Corrosion
   - Mechanisms
   - Integrity Management Program
   - Inspection Techniques and Pigging
   - Assessment of Metal Loss
   - Technical Basis of ASME B31G Method
   - New ASME B31G Options
   - API 579 / ASME FFS-1
   - Assessment of Pitting
   - Assessment of Grooving
   - Assessment of Crack-Like Flaws
   - Assessment of Dents and Gouges

7. Repair Techniques
   - Replacement
   - Grinding
   - Weld Deposition
   - Type A Sleeve Reinforcing
   - Type B Sleeve Pressure Containment
   - Composite Wrap Repairs
   - Mechanical Bolt-On Clamp
   - Inserted Liners
   - Hot Tap
   - Fittings

Subject Matter Expert (SME):

George Antaki, Fellow ASME, has over 40 years of experience in nuclear power plants and process facilities, in the areas of design, safety analysis, startup, operation support, inspection, fitness for services and integrity analysis, retrofits and repairs. George has held engineering and management positions at Westinghouse and Washington Group International, where he has performed work at power and process plants, and consulted for the Department of Energy (DOE), the Nuclear Regulatory Commission (NRC) and the Electric Power Research Institute (EPRI). He also is an instructor of failure prevention, inspection and equipment integrity courses for ASME, and has done teaching assignments for the Department of Energy as well as many other private organizations. Mr. Antaki has authored several articles, publications and two textbooks on design and mechanical integrity of plant systems and components. George serves as a member of several committees including:

- ASME/API Joint Committee on Fitness for Service Member
- B31 Mechanical Design Technical Committee Vice Chair
- Post Construction Subcommittee on Repair and Testing (PCC) Member
- Pressure Technology Post Construction Committee Member
- Pressure Technology Post Construction Executive Committee Member

- Subgroup on Dynamic Qualification Member
- Task Group on Impulsively Loaded Vessels (SC VIII) Member
- Working Group on Piping (SG-D) (SC III) Chairman