Engineering Criticality Assessment (ECA) to BS7910/DNV OS-F101

Course Title: Engineering Criticality Assessment (ECA) to BS7910/DNV OS-F101

Duration: 3 Days

Course Description:

Assessing cracks or crack-like flaws in welded and non-welded components such as pipelines, pressure vessels, structures and piping components under static and cyclic loading condition is of high interest for safe operation of the assets. This course focuses on the methodology defined by BS7910 and DNV OS-F101 as the main assessment procedures.

The attendees will receive a certificate from Z-Subsea by completion of the training course.

This training course helps to gain understanding on:

Typical fracture and fatigue failures
Overview of Fitness for Purpose Methods
Fracture Mechanics and Fatigue Theory
Fracture Mechanics testing
Non-Destructive Testing (NDT) techniques
Introduction to BS7910 and DNV OS-F101 and Failure Assessment Diagram (FAD) approach
Fatigue assessment to BS7910 and DNV RP-C203
Sour-Service ECA
Reinforce learning using case studies and worked examples

Who should attend?

Integrity engineers
Safety engineers
Material Corrosion engineers
Pipeline engineers;
Subsea and offshore engineers;
Project engineers and managers;
Engineers from other sectors of the Oil and Gas industry who wish to gain understanding of Integrity assessment of pipelines and welded assets.

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Course Contents:

1. Typical Fatigue and Fracture related Failures

- Failure case studies
- Actual failures and lesson learned

2. Overview of Fitness-for-purpose methods

- Concept of fitness-for-purpose methods and engineering critical assessment (eca)
- Background
- Parameters that influence structural integrity

3. Fracture mechanics and Fatigue theory

4. Materials issue

- Awareness of flaw types (mainly in welds) including fabrication and service flaws
- Materials/service issues and their effects on fracture toughness

5. Fracture mechanics testing

6. Non-destructive testing (inspection)

- Role of NDT in ECA
- Capabilities of major NDT methods

7. Introduction to BS7910/DNV OS-F101

- Background and definitions (flaw types and stress categorisation

8. Failure Assessment Diagram Approach

Fracture assessment procedures in BS 7910 and DNV OS-F10 (calculation steps)

Fatigue of welded structures:

- Background to fatigue design of welded joints
- Factors which affect the fatigue of welds

9. Fatigue assessment to BS7910 and DNV RP-C203

- Fracture mechanics based calculations of fatigue crack growth

10. Extension of the ECA methodology

- BS7910 and DNV OS-F101 Annexes

11. Sour-service ECA

- Determination of materials properties
- Relevant published data
- Assessment of flaw tolerance
- Fracture assessment of circumferential girth weld flaws
- Guidance in BS7910 and DNV-OS-F101
- Guidance in DNV-RP-F108