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Course Name

Pressure Equipment Integrity & Engineering Assessment

Sector Name

Mechanical Engineering

Document Type

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Pressure Equipment Integrity & Engineering Assessment

Course Introduction

Pressure vessels and other pressure-containing equipment operate under combinations of pressure, temperature, process conditions, mechanical loads, and material degradation that can change significantly throughout their service life. Corrosion, cracking, erosion, deformation, overheating, and other damage mechanisms may gradually reduce equipment integrity, while inspection findings alone do not always indicate what the equipment can safely continue to withstand. Engineers therefore need to connect equipment design, operating history, degradation, and inspection evidence before making decisions about continued operation or corrective action.

Boost Consulting & Training offers this course to develop a practical engineering approach to evaluating the mechanical integrity of pressure equipment. Participants examine equipment construction and loading, materials, degradation mechanisms, inspection findings, remaining condition, engineering assessment principles, and integrity decisions. Practical cases focus on interpreting real equipment evidence and determining when continued operation, further assessment, repair, monitoring, or other engineering intervention is appropriate.

The **main concept of this course** is to convert pressure equipment condition and inspection evidence into sound engineering decisions that protect mechanical integrity throughout the equipment lifecycle.

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Target Audience

- ✓ Mechanical and pressure equipment engineers
- ✓ Plant and inspection engineers
- ✓ Mechanical integrity professionals
- ✓ Technical engineers responsible for pressure equipment condition and performance

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Learning Objectives

- ✓ Explain the mechanical behavior and integrity requirements of pressure equipment.
- ✓ Identify major loads and operating conditions affecting equipment condition.
- ✓ Recognize common degradation and damage mechanisms in pressure-containing equipment.
- ✓ Connect material behavior and service conditions with potential deterioration.
- ✓ Interpret inspection findings from an engineering integrity perspective.
- ✓ Evaluate the significance of wall loss, cracking, deformation, and other detected damage.
- ✓ Determine appropriate responses to equipment integrity concerns.
- ✓ Apply structured engineering assessment to pressure equipment condition cases.

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Pressure Equipment Integrity & Engineering Assessment

Course Outline

✓ Day 01

Understanding Pressure Equipment Integrity

Reading Equipment Design and Loading

- ✓ Examine pressure vessels and common pressure-containing equipment configurations.
- ✓ Understand the effects of pressure, temperature, weight, and external mechanical loads.
- ✓ Connect operating conditions with stresses acting on equipment components.

Recognizing Integrity Boundaries

- ✓ Identify shells, heads, nozzles, welds, supports, and other integrity-critical areas.
- ✓ Understand how design features influence local mechanical behavior.
- ✓ Build a **Pressure Equipment Integrity Map** for a representative vessel.

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Pressure Equipment Integrity & Engineering Assessment

Course Outline

✓ Day 02

Understanding How Pressure Equipment Deteriorates

Identifying Degradation Mechanisms

- ✓ Examine corrosion, erosion, cracking, fatigue, creep, and temperature-related deterioration.
- ✓ Connect degradation mechanisms with material, environment, and operating conditions.
- ✓ Distinguish general deterioration from localized damage requiring focused assessment.

Reading Damage Evidence

- ✓ Recognize wall loss, surface damage, cracking indications, distortion, and other condition findings.
- ✓ Evaluate how location and damage geometry influence engineering significance.
- ✓ Complete a **Damage Mechanism Investigation** using equipment history and observed condition.

Pressure Equipment Integrity & Engineering Assessment

Course Outline

✓ Day 03

Turning Inspection Findings into Engineering Information

Interpreting Inspection Results

- ✓ Review thickness measurements, visual findings, crack indications, and other inspection information.
- ✓ Distinguish isolated readings from meaningful deterioration patterns.
- ✓ Compare current findings with previous inspection history to understand condition progression.

Evaluating Remaining Condition

- ✓ Assess remaining wall thickness and deterioration trends against equipment requirements.
- ✓ Consider uncertainty, measurement limitations, and future degradation when interpreting condition.
- ✓ Complete a **Pressure Equipment Condition Assessment** using realistic inspection data.

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Course Outline

✓ Day 04

Assessing Equipment with Detected Damage

Applying Engineering Assessment Principles

- ✓ Understand the role of engineering assessment when inspection identifies significant deterioration.
- ✓ Evaluate damage according to type, extent, location, loading, and operating conditions.
- ✓ Recognize when simplified evaluation is insufficient and specialist analysis is required.

Making Integrity Decisions

- ✓ Compare continued operation, increased monitoring, operating restrictions, repair, and replacement options.
- ✓ Consider remaining service requirements and consequences when selecting an engineering response.
- ✓ Run an **Integrity Decision Case** involving competing operational and engineering considerations.

Pressure Equipment Integrity & Engineering Assessment

Course Outline

✓ Day 05

Managing Pressure Equipment through Its Remaining Service

Selecting the Appropriate Engineering Response

- ✓ Define repair, monitoring, inspection, and operating actions according to assessed equipment condition.
- ✓ Determine what evidence is required before returning affected equipment to normal service.
- ✓ Establish follow-up requirements for equipment operating with known degradation.

Completing the Engineering Assessment

- ✓ Combine operating history, degradation mechanisms, inspection evidence, and engineering evaluation.
- ✓ Document assumptions, findings, limitations, and recommended actions clearly.
- ✓ Complete a **Pressure Equipment Engineering Assessment Case** from initial inspection findings through the final integrity decision.

Pressure Equipment Integrity & Engineering Assessment

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 7, 2026	Dec. 11, 2026	5 days	4250.00 \$	UAE , Dubai

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