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Course Name

Instrumentation Calibration & Measurement Accuracy

Sector Name

Instrumentation & Controls

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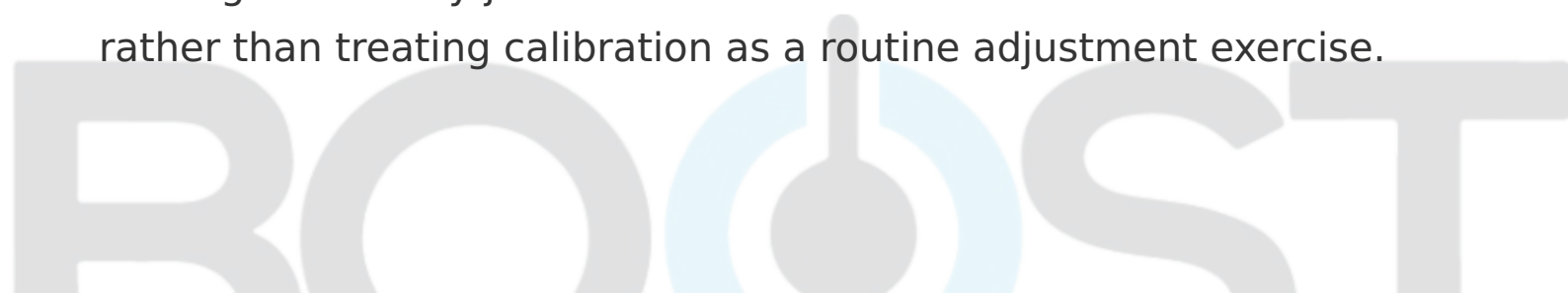
Instrumentation Calibration & Measurement Accuracy

Course Introduction

A process measurement can appear stable and still be wrong. Instrument drift, incorrect range configuration, installation effects, environmental conditions, reference-equipment limitations, or poor calibration practices can introduce errors that influence process control, product quality, equipment protection, and operational decisions. Effective calibration therefore requires more than adjusting an instrument until its indication matches a reference value; engineers and technicians need to understand whether the complete measurement result is accurate, traceable, and suitable for its intended application.

Boost Consulting & Training offers this course to develop practical capability in industrial instrument calibration and measurement accuracy. Participants work with calibration principles, reference standards, error evaluation, tolerance, uncertainty, traceability, calibration procedures, documentation, and common pressure, temperature, flow, and level applications.

The course emphasizes interpreting calibration results and making technically justified decisions about instrument condition rather than treating calibration as a routine adjustment exercise.



The **main concept of this course** is to establish confidence in industrial measurements by connecting correct calibration practices with measurement accuracy, traceability, and evidence-based instrument decisions.

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Target Audience

- ✓ Instrumentation and control engineers
- ✓ Calibration and instrument technicians
- ✓ Measurement and metrology professionals
- ✓ Engineers responsible for process measurement quality

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Learning Objectives

- ✓ Explain the principles and purpose of industrial instrument calibration.
- ✓ Distinguish accuracy, precision, error, tolerance, uncertainty, repeatability, and resolution.
- ✓ Select appropriate reference standards and calibration equipment.
- ✓ Perform and evaluate calibration across common industrial measurement applications.
- ✓ Identify zero, span, linearity, hysteresis, and repeatability problems.
- ✓ Interpret calibration results against defined acceptance criteria.
- ✓ Apply traceability and measurement uncertainty principles to calibration activities.
- ✓ Document calibration results and determine appropriate actions for instruments outside acceptable limits.

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Instrumentation Calibration & Measurement Accuracy

Course Outline

✓ DAY 01

Understanding Measurement Accuracy

Reading Measurement Performance

- ✓ Distinguish accuracy, precision, repeatability, resolution, sensitivity, and stability.
- ✓ Understand absolute, relative, and percentage measurement errors.
- ✓ Recognize how instrument performance can change across its measurement range.

Defining Calibration Acceptance

- ✓ Establish expected values, tolerances, and acceptance limits for measurement applications.
- ✓ Distinguish calibration from adjustment, verification, and functional testing.
- ✓ Complete a Measurement Accuracy Assessment using contrasting instrument results.

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Course Outline

✓ DAY 02

Building a Reliable Calibration Process

Selecting Calibration References

- ✓ Understand the role of reference standards and calibration equipment.
- ✓ Match reference accuracy and range with the instrument being calibrated.
- ✓ Recognize limitations that can make a reference unsuitable for a calibration task.

Establishing Measurement Traceability

- ✓ Trace measurement results through reference standards to recognized measurement standards.
- ✓ Understand calibration certificates and the information required to support traceability.
- ✓ Build a Calibration Traceability Chain for an industrial measurement application.

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Course Outline

✓ DAY 03

Calibrating Industrial Instruments

Calibrating Pressure and Temperature Instruments

- ✓ Establish suitable test points across the operating range.
- ✓ Identify zero, span, linearity, hysteresis, and repeatability behavior.
- ✓ Evaluate calibration results before and after instrument adjustment.

Applying Calibration to Flow and Level Measurement

- ✓ Understand calibration and verification approaches for common flow and level applications.
- ✓ Account for process variables and configuration factors influencing measurement results.
- ✓ Complete a Multi-Instrument Calibration Exercise across different measurement technologies.

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Course Outline

✓ DAY 04

Evaluating Calibration Quality

Understanding Measurement Uncertainty

- ✓ Identify significant sources of uncertainty within a calibration process.
- ✓ Understand how reference equipment, resolution, environment, and repeatability affect confidence in results.
- ✓ Evaluate whether measurement uncertainty is suitable for the required application.

Making Pass or Fail Decisions

- ✓ Compare calibration results with defined tolerance and acceptance requirements.
- ✓ Assess borderline results where uncertainty influences the decision.
- ✓ Run a Calibration Decision Challenge involving instruments with different errors and uncertainty conditions.

Instrumentation Calibration & Measurement Accuracy

Course Outline

✓ DAY 05

Managing Instruments after Calibration

Handling Out-of-Tolerance Results

- ✓ Determine appropriate actions when an instrument fails calibration.
- ✓ Evaluate the potential significance of measurements made since the previous acceptable calibration.
- ✓ Distinguish adjustment, repair, replacement, and further investigation requirements.

Strengthening Calibration Performance

- ✓ Analyze recurring calibration failures, drift patterns, and unnecessary calibration activity.
- ✓ Use historical calibration evidence to support appropriate calibration intervals and priorities.
- ✓ Complete an Instrument Calibration Case from initial test results through error evaluation, adjustment, verification, and final calibration decision.

Instrumentation Calibration & Measurement Accuracy

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Nov. 30, 2026	Dec. 4, 2026	5 days	4250.00 \$	UAE , Abu Dhabi
Jan. 17, 2027	Jan. 21, 2027	5 days	4250.00 \$	KSA , Riyadh
May 31, 2027	June 4, 2027	5 days	4250.00 \$	UAE , Dubai
Sept. 6, 2027	Sept. 10, 2027	5 days	4950.00 \$	England , London

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