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COURSE BROCHURE

Advanced Flow Measurement and Custody Transfer Training Course

17 – 28 January 2027
Muscat

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Registered in the United Kingdom and Saudi Arabia

Advanced Flow Measurement and Custody Transfer Training Course

Ref: 124_3179 **Date:** 17 – 28 January 2027 **Location:** Muscat **Fees:** 11700 GBP

Advanced Flow Measurement and Custody Transfer is a 2-week training course for metering engineers, measurement technicians, allocation specialists and custody transfer supervisors, ending with a metering station audit file covering flow computer checks, calibration intervals and mismeasurement correction. Small fiscal meter errors quickly become disputed invoices. Jupiter Prime Training delivers this course for measurement professionals.

Why Flow Measurement and Custody Transfer Matters Now

Three forces are reshaping custody metering. Operators are replacing orifice runs with ultrasonic and Coriolis meters whose diagnostics generate far more evidence than older stations ever did. Buyers, sellers and joint-venture partners now challenge allocation figures quickly, often with their own check meters. A station that drifts unnoticed produces lost revenue, contract disputes and costly retrospective adjustments. The course rests on recognised industry measurement standards, including API standards for liquid hydrocarbon metering and proving, described in general terms throughout.

Who Gains Most from Flow Measurement and Custody Transfer

- Engineers who select, size and specify fiscal and allocation meters
- Technicians who maintain transmitters, provers, samplers and flow computers
- Specialists who reconcile allocation between fields, partners and pipeline entry points
- Supervisors who witness proving runs and approve measurement tickets
- Auditors who test whether a station's records, seals and calculations would survive a counterparty challenge

A measurement group that sends its engineer, its senior technician and its allocation lead together gains most.

Flow Measurement and Custody Transfer Capabilities

Participants leave able to defend a fiscal quantity from the primary element to the printed ticket.

- Specify the meter technology suited to fluid, flow range and turndown — station design and procurement decisions
- Calculate an uncertainty budget for a complete metering train — contract tolerance negotiations with counterparties
- Assess proving results and meter factor trends against control limits — decisions to accept or reject a meter
- Test flow computer configuration, constants and alarm handling — the integrity of every reported batch
- Design calibration and verification intervals from risk and history — maintenance planners and budget holders
- Build a mismeasurement correction with transparent assumptions — commercial teams settling a disputed period

Key Flow Measurement and Custody Transfer Terms

- Custody transfer — the point where ownership of a fluid passes between parties, measured to a contractually agreed accuracy for billing.
- Meter factor — the ratio of a prover's reference volume to the volume the meter indicated, applied to correct later readings.
- Prover — a reference device, such as a pipe prover, tank prover or master meter, used to verify a meter in service.
- Uncertainty budget — an estimate combining every error source in a metering train into one stated uncertainty.
- Flow computer — an electronic device that converts meter signals, pressure, temperature and density into standard quantities and audit records.
- Mismeasurement — a period in which a station reported incorrect quantities, requiring an agreed correction between the affected parties.

Flow Measurement and Custody Transfer Day by Day

Day 1: Commercial Context of Fiscal Metering

- Sales Contracts and Measurement Clauses — Tolerances Each Party Can Enforce
- Fiscal, Allocation and Operational Metering Tiers — Choosing the Accuracy Each Point Needs
- Recognised Industry Measurement Standards — Which Practice Governs Each Station Element
- Base Conditions and Standard Volumes — Consistent Quantities Across Buyers and Sellers
- Measurement Ticket Anatomy — What a Counterparty Will Check First

Day 2: Differential Pressure Meters

- Orifice Plate Geometry and Discharge Coefficient — When an Existing Run Stays Acceptable
- Venturi and Cone Meters — Lower Pressure Loss Against Installation Cost
- Flow Conditioners and Straight Lengths — Velocity Profile Effects on Accuracy
- Plate Inspection, Edge Sharpness and Bowing — Inspection Frequency Decisions
- Differential Pressure Transmitter Stacking — Covering Wide Turndown Without Losing Resolution

Day 3: Ultrasonic Meter Performance

- Transit-Time Path Configurations — Selecting Chordal Layouts for Gas and Liquid Service
- Velocity of Sound Comparison — Early Warning of Path or Composition Faults
- Profile Factor, Symmetry and Swirl Diagnostics — Condition-Based Verification Instead of Removal
- Fouling, Noise and Valve Interference — Locating Meters Away from Control Valves
- Dry Calibration Versus Flow Calibration — Evidence a Counterparty Will Accept

Day 4: Coriolis and Turbine Metering

- Coriolis Mass Measurement and Density Output — Replacing Separate Densitometers
- Zero Stability and Two-Phase Effects — Limits of Coriolis in Wet Service
- Turbine Meter Linearity and Viscosity Sensitivity — Fit for Crude Versus Refined Products
- Positive Displacement Meters — Heavy Oil and Low-Flow Fiscal Duties
- Technology Selection Matrix — Matching Fluid, Range and Maintenance Capacity

Day 5: Meter Proving Practice

- Bidirectional and Unidirectional Pipe Provers — Sizing Against Meter Flow Range
- Small Volume Provers and Pulse Interpolation — Proving Low-Pulse Meters Reliably
- Master Meter Proving — Where a Fixed Prover Is Not Practical
- Repeatability Criteria and Run Selection — Accepting or Rejecting a Proving Sequence
- Meter Factor Control Charts — Spotting Drift Before It Reaches the Invoice

Day 6: Secondary Instruments and Sampling

- Pressure and Temperature Element Placement — Correction Factor Accuracy for Volumes
- Online Densitometers and Gas Chromatographs — Composition Inputs to Energy Quantity
- Automatic Sampling and Mixing — Representative Samples for Water and Sediment
- Sediment and Water Determination — Net Standard Volume for Crude Sales
- Instrument Verification Records — Traceable Evidence for Each Secondary Input

Day 7: Uncertainty and Calculation Integrity

- Measurement Uncertainty Propagation — Combining Primary and Secondary Error Sources
- Sensitivity Coefficients for Each Input — Where Calibration Effort Pays Back Most
- Gas Volume and Energy Calculations — Compressibility and Calorific Value Inputs
- Liquid Volume Correction Factors — Temperature and Pressure Effects on Liquid
- Uncertainty Statements in Contracts — Tolerances Both Parties Can Verify

Day 8: Flow Computers and Station Records

- Flow Computer Configuration Audit — Constants, Units and Calculation Versions
- Alarm, Event and Audit Trail Logs — Evidence for a Disputed Batch
- Batch and Daily Reports — Reconciling Tickets with Supervisory Records
- Security Seals and Access Control — Protecting Fiscal Settings from Unauthorised Change
- Data Transmission and Supervisory Checks — Integrity from Skid to Accounting

Day 9: Allocation, Losses and Corrections

- Allocation Methods for Shared Pipelines — Fair Splits Between Producers and Partners
- Line Pack and Imbalance Tracking — Explaining Gains and Losses Between Meters
- Calibration Interval Design — Risk-Based Frequency for Each Station Element
- Mismeasurement Detection Triggers — When a Correction Becomes Necessary
- Mismeasurement Correction Methods — Agreed Recalculation for an Affected Period

Day 10: Practising the Metering Station Audit File

- Station Walkdown Against Meter Selection Criteria — Confirming Installation Effects
- Proving History and Control Chart Review — Judging Current Meter Health
- Uncertainty Budget for the Audited Station — Comparing Against Contract Tolerance
- Flow Computer and Record Verification — Testing Every Fiscal Constant
- Metering Station Audit File — Findings, Intervals and Correction Recommendations

Applying Flow Measurement and Custody Transfer After the Course

- Lead a configuration audit of one fiscal flow computer, comparing every constant and calculation version against the station design basis.
- Set up meter factor control charts for the busiest proving station and agree action limits with the operations supervisor.

Flow Measurement and Custody Transfer Questions FAQ

What is flow measurement and custody transfer, and why does it matter now?

Flow measurement and custody transfer is the metering practice that fixes the quantity billed when ownership of oil, gas or chemicals changes hands. It matters now because newer meters provide richer diagnostics while counterparties scrutinise allocation more closely, so weak stations are exposed faster.

Which roles gain most from advanced flow measurement and custody transfer training?

Metering engineers, instrument technicians, allocation specialists and custody transfer supervisors gain most. The course shows how a choice at the meter, prover or flow computer changes the invoiced quantity.

How does advanced flow measurement and custody transfer differ from a general instrumentation course?

It focuses on fiscal quantities rather than process control. It follows every signal to a contract ticket, covering proving, uncertainty budgets, flow computer integrity and correction between commercial parties.

What do you bring back from flow measurement and custody transfer training?

You bring back an audit file for a metering station you know. It records meter suitability, proving history, an uncertainty budget, flow computer findings, calibration intervals and a correction method.

Flow Measurement and Custody Transfer: The Way Forward

The metering station audit file first informs whether a station can stay in fiscal service unchanged or needs recalibration, re-proving or redesign. Measurement engineers and commercial staff use it together when quantities are questioned. After its first use, revisit the calibration intervals it proposes, because meter diagnostics and proving trends will show whether risk was judged correctly.