

# Metering and Hydrocarbon Allocation Services

Design, implementation, operation and maintenance of metering installations for Oil, Gas or Petrochemical products present many complex issues, specifically if custody transfer is involved. For these metering installations it must be proven and guaranteed that the gas or liquid products delivered meet the contractual quality specification and that the delivered quantities are correct and remain within the acceptable band of measurement uncertainty for the type of measurement.



These requirements are demanded both by legislations/tax authorities and by contractual agreements with customers and partners. Obviously these requirements have to be met throughout the lifecycle of the installation and need to be verified and validated at regular intervals.

Hint has extensive expertise and experience in the field of (custody transfer) metering systems. Hint metering services help you to optimize metering accuracy, recalculating production figures, reducing costs of materials and making engineering and maintenance activities more efficient by using intelligent IT tools (e.g. AML Metering Dashboard, MESREPA, HUST). It is our policy to design for a minimum Total Cost of Ownership. This might require higher initial costs for equipment and engineering, but is lowering the costs during the operational phase and in maintenance.

Hint is familiar with the latest metering principles (e.g. ultrasonic flow, multi phase flow, wet gas measurement, multi-variable devices, emissions, pc-based flow computer and virtual metering), smart instruments and the development of international standard (Fieldbus) for such instruments.

Correct and validated quality measurements are an integral part of hydrocarbon allocation. This involves field and laboratory analysers, LIMS functions and a well founded QMI concept. Hint has proven capability to include process analysers in the metering concept and to continuously validate the accuracy of the analyser system (for more details see Hint AML Analyser Management).

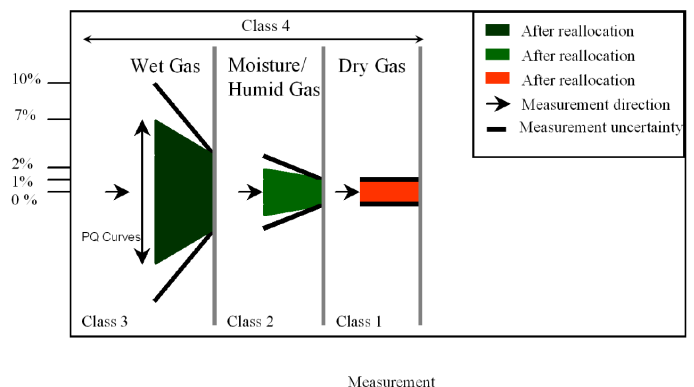
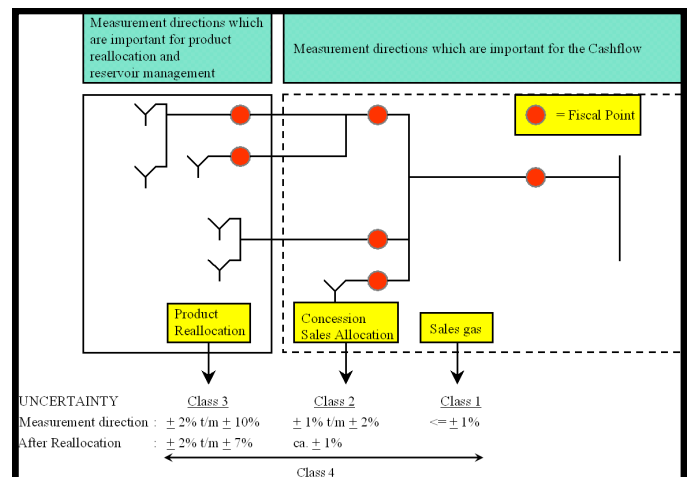
Finally Hint is strong in using remote and secure interfaces between Process Automation- and Business Systems e.g. in AML Metering Dashboard, to allow for intelligent performance monitoring (KPI's and CSF's), data registration and analysis. Frequently the use of such modern technology helps reducing the total cost of ownership during the lifetime of an installation.

## Metering and Re-allocation measurement points

The diagram below shows schematically the issues involved. The focus for Product re-allocation and reservoir management differs from the focus for sales allocation.

## Metering and Hydrocarbon Allocation Classes and Expected Accuracies

- Class 1: Fiscal metering and sales
- Class 2: Out of concession, sales allocation
- Class 3: Product allocation
- Class 4: Environmental (emissions)



## Hint Metering and Hydrocarbon Allocation Services

Hint services focus on (custody transfer) Metering, Analyser management, Loading control, Reallocation measurements, Product reallocation, Concession reallocation and Production- and Reservoir management.

### Key Features

- + Top Down Lifecycle Design of Metering applications
- + Metering and Allocation Audits
- + Web based monitoring of Metering Performance
- + Experienced professionals

The following table indicates the services available from Hint for the phases in the lifecycle of an installation, from the conceptual design, up to the operational period and maintenance.

### Conceptional design

- Feasibility study
- Determination of
  - Reallocation/Reconciliation system
  - Overall measurement uncertainty
  - Fiscal Metering / QMI Standards
  - Operation & maintenance philosophy
  - Metering principles

### Basis of design

- Basic function blocks
- Selection of standards
- Typical measurement configurations
- Cost aspects
- System integration
- Environmental and site conditions
- Instrument and support equipment

### Project specification

- Specification of metering elements
- Specification of piping
- Specification of field instrument cabinets
- Specification of flow metering cabinets
- Specification of analysers
- Specification of analyser cabinets
- Specification of sample conditioning equipment
- Specification of electrical requirements
- Specification of a supervisory computer system

### Detailed engineering

- Project management
- Station manuals
- Reallocation diagrams
- Equipment evaluation/ specification
- Requisitioning
- Vendor selection / list of approved equipment
- Sizing of flow meters
- Design of procedures (Calibration, Test, ...)
- Sampling interval/procedures
- Software development
- Definition of maintenance contract
- Determination of flow computer configurations/ parameters
- Determination of calibration limits
- Determination of physical properties
- Authority approval
- Drawings / schedules (loopdiagrams, PEF's, ...)

### Project execution & commissioning

- Software development and Implementation of complete AML systems
- Installation procedures
- Education
- Construction & installation of
  - AML software systems
  - flow cabinets
  - metering cabinets
  - dew point analyzers
  - PGC's
- Project execution plan
- Inspection (FAT, CAT, SAT)
- Commissioning
- Start-up
- Training and metering courses
- Seminars, workshops and lectures

### Operation & maintenance

- Interpolation of sampling results
- Interpolation of measurement uncertainties
- Interpretation of analysis results
- Data management and analysis
- Outlier tests on analysis results
- Flow calculation
- Orifice bending
- Uncertainty calculation
- Calculation of physical properties
- Education
- Maintenance management (cost optimization)
- Performance monitoring of instruments (reliability, MTBF)
- Fiscal metering / QMI audits
- Verification of calibration limits
- (Re) calibration
- Interpretation of calibration results
- Validation
- Test certification
- Sampling
- Re-engineering based on plant changes



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