

ISO/TS 26762:2025-04 (E)

Design and operation of allocation systems used in gas productions facilities

Contents

Page

Foreword vii

Introduction viii

1 Scope 1

2 Normative references 1

3 Terms and definitions 1

3.1 Fluids 2

3.2 Definitions for allocation systems 4

3.3 Streams 6

4 Allocation fundamentals 7

4.1 Allocation definition and objective 7

4.2 Allocation and metering 7

4.3 Gas productions facilities 7

4.4 Allocation applications and cases 8

4.5 Allocation types and classification 8

4.5.1 General 8

4.5.2 Technical allocation 8

4.5.3 Contractual and fiscal allocation 9

4.6 Allocation in the value realization chain 9

4.7 Allocation boundaries and steps 11

4.8 Physical streams 12

4.8.1 General 12

4.8.2 Products 12

4.8.3 Input streams 13

4.8.4 Fluid characteristics 13

4.8.5 Gas and liquid compositions 13

4.9 Allocation process 13

4.10 Gas allocation cases summary 14

4.11 Allocation methodology 14

4.12 Balance and reconciliation 15

4.12.1 Balance 15

4.12.2 Reconciliation 17

4.13 Units 17

4.14 Upstream allocation example 17

4.15 Contractual gas allocation 18

4.15.1 General 18

4.15.2 Gas-allocation issues 19

4.15.3 Measurement 19

4.15.4 Terminal products 20

4.15.5 Pipeline capacity 20

4.15.6 System response time 20

4.15.7 Agreements 20

4.15.8 Regulatory 21

4.15.9 Commercial issues 21

4.15.10 Time period 21

4.15.11 Forecasting 21

4.15.12 Pipeline stock 22

4.15.13 Existing systems 22

4.15.14 Data timing 22

4.15.15 Data flow and reporting 22

	4.15.16 Auditing.....	22
	4.15.17 Fallback.....	22
	4.15.18 Summary.....	22
5	Fluid property and parameters for allocation.....	23
	5.1 Fluid types.....	23
	5.2 Gas and liquid properties.....	24
	5.2.1 General.....	24
	5.2.2 Stabilized fluids.....	24
	5.2.3 Equilibrium gas (separated gas at dew point).....	24
	5.2.4 Equilibrium liquid (separated liquid at bubble point).....	24
	5.2.5 Flash calculations for non-stabilized and wet gas flows.....	24
	5.3 Fluid information for allocation.....	25
	5.3.1 Fluid compositions.....	25
	5.3.2 Fluid properties.....	25
	5.3.3 Allocation process factors for gas allocation.....	26
	5.3.4 Blending effect.....	29
	5.4 Use of phase behaviour/process simulation models.....	29
	5.4.1 Introduction.....	29
	5.4.2 Applications.....	30
	5.4.3 Process simulation model types.....	30
	5.4.4 Fundamentals of a process simulation model.....	31
	5.4.5 Using process simulation models.....	31
	5.4.6 Construction of a process simulation model.....	32
	5.4.7 Modelling approaches.....	33
	5.4.8 Example of process simulation modelling for allocation: calculation of shrinkage factors.....	34
6	Measurements, sampling and analysis.....	36
	6.1 General.....	36
	6.2 Flow measurements.....	36
	6.2.1 Single-phase liquid measurement.....	36
	6.2.2 Multiphase measurements.....	37
	6.2.3 Gas measurement.....	37
	6.2.4 Wet gas and multiphase fluids.....	39
	6.2.5 Indirect methods.....	40
	6.2.6 Virtual metering.....	40
	6.2.7 Measurement uncertainty.....	40
	6.3 Sampling.....	41
	6.3.1 General.....	41
	6.3.2 Single phase gas.....	41
	6.3.3 Single-phase liquid.....	41
	6.3.4 Wet gas sampling.....	41
	6.3.5 Multiphase sampling.....	42
	6.3.6 PVT sampling.....	42
	6.3.7 Considerations on sampling points.....	42
	6.3.8 Sampling of gas containing sulfur compounds.....	42
	6.4 Analysis.....	43
	6.4.1 Wet gas composition analysis.....	43
	6.4.2 Gas chromatographic method for compositional analysis.....	43
	6.4.3 Laser Raman spectroscopy and infrared spectroscopy method.....	43
	6.4.4 Analysis for geochemical fingerprinting.....	43
	6.4.5 Sulfur content analysis.....	43
	6.4.6 Water content analysis.....	43
	6.4.7 Analysis of gaseous water.....	43
	6.4.8 Analysis of liquid water fraction.....	43
	6.4.9 Water-liquid ratio for liquid.....	44
	6.4.10 Determination of particles content.....	44
	6.4.11 Wet gas physical parameters measurement.....	44
	6.4.12 Density.....	44
	6.4.13 Compression factor.....	44
	6.4.14 Speed of sound.....	45
	6.4.15 Calorific value.....	45
7	Allocation principles.....	45

7.1	General.....	45
7.2	Allocation methods.....	45
7.3	Allocation units for gas allocation.....	46
7.4	Proportional allocation.....	46
	7.4.1 General.....	46
	7.4.2 Pro rata based on estimations.....	48
	7.4.3 Component mass pro rata.....	49
7.5	Allocation by by-difference.....	50
7.6	Allocation by process simulation.....	50
7.7	Uncertainty based allocation.....	51
7.8	Geochemical fingerprinting.....	53
7.9	Conversion calculation.....	53
	7.9.1 Mass allocation conversion into volume.....	53
	7.9.2 Mass allocation conversion to energy.....	55
7.10	Quantity allocation.....	56
	7.10.1 General.....	56
	7.10.2 Mass-quantity allocation.....	57
	7.10.3 Volume quantity allocation.....	57
	7.10.4 Energy-quantity allocation.....	57
7.11	Allocation calculations.....	57
	7.11.1 General.....	57
	7.11.2 Calculations at the measurement points.....	57
	7.11.3 Allocated field's share.....	60
7.12	Allocation methodology selection.....	63
7.13	Balancing and reconciliation calculations.....	64
	7.13.1 General.....	64
	7.13.2 Reconciliation.....	64
	7.13.3 Balancing and reconciliation accounts.....	65
8	Utility and disposed gas allocation.....	65
	8.1 General.....	65
	8.2 Utility gas allocation by volume.....	67
	8.3 Injection and sales (purchase) gas allocation.....	69
	8.4 Export gas and oil mass and volume.....	70
9	Inventory.....	70
10	Allocation cases and typical lay out.....	71
	10.1 Allocation cases.....	71
	10.1.1 General.....	71
	10.1.2 Well allocation and well production.....	72
	10.1.3 Asset, field and subgroup, upstream allocation.....	73
	10.1.4 Pipeline, midstream allocation.....	73
	10.1.5 Terminal, downstream allocation.....	73
	10.1.6 Liquid natural gas.....	74
	10.1.7 Carbon dioxide CO ₂	74
	10.1.8 New development tied into an existing one.....	74
	10.1.9 New development tied into an existing transportation system.....	75
	10.2 Typical allocation lay out.....	75
	10.2.1 Gas only.....	75
	10.2.2 Dry gas in, dry gas and liquid out.....	76
	10.2.3 Wet gas combined in, dry gas and liquid out.....	76
	10.2.4 Dry gas and liquid in; dry gas and liquid out.....	77
11	Allocation uncertainty (from HM 96).....	78
	11.1 General.....	78
	11.2 Relative and absolute uncertainty.....	78
	11.3 Uncertainty of a calculated value -analytical solution.....	78
	11.4 Allocation per difference.....	79
	11.5 Proportional/pro rata allocation.....	80
	11.6 Uncertainty based allocation.....	81

11.7	Uncertainty of a calculated value – other methods	82
11.8	Uncertainty contributors	82
12	Allocation systems design and integration	82
12.1	General	82
12.2	Metering and allocation philosophy	85
12.3	Allocation agreements	85
12.4	Regulations	85
12.5	Development procedure	85
12.5.1	General	85
12.5.2	Step 1	86
12.5.3	Step 2	87
12.5.4	Step 3	87
12.5.5	Step 4	88
13	Operation of allocation systems	88
13.1	General	88
13.2	Input QA/QC	90
13.3	Imbalance follow up	90
13.4	Trending	91
13.5	Surveillance	91
13.6	Validation	91
13.6.1	General	91
13.6.2	Meter validation	92
13.6.3	Allocation procedures and process validation	92
13.6.4	Data validation	93
13.6.5	Data reconciliation	93
13.6.6	Process-model validation	93
13.6.7	Allocation-process results validation	93
13.6.8	Software validation	94
13.7	Mismeasurement handling	94
14	Audits	95
14.1	General	95
14.2	Metering and allocation audit objectives	95
14.3	MandA audit boundary and activity	95
14.3.1	Installations	95
14.3.2	Systems	95
14.3.3	Metering and allocation activity	96
14.4	Audit scope	96
14.5	Audit findings	97
14.5.1	General	97
14.5.2	Audit exceptions	97
14.5.3	Audit recommendations	97
14.5.4	Audit observation	97
14.5.5	Allocation audit checklist	97
	Annex A (informative) Exposure to loss/risk assessment	99
	Bibliography	103