



Carbon Constraint Initiatives



Verification EU ETS

ECRAN

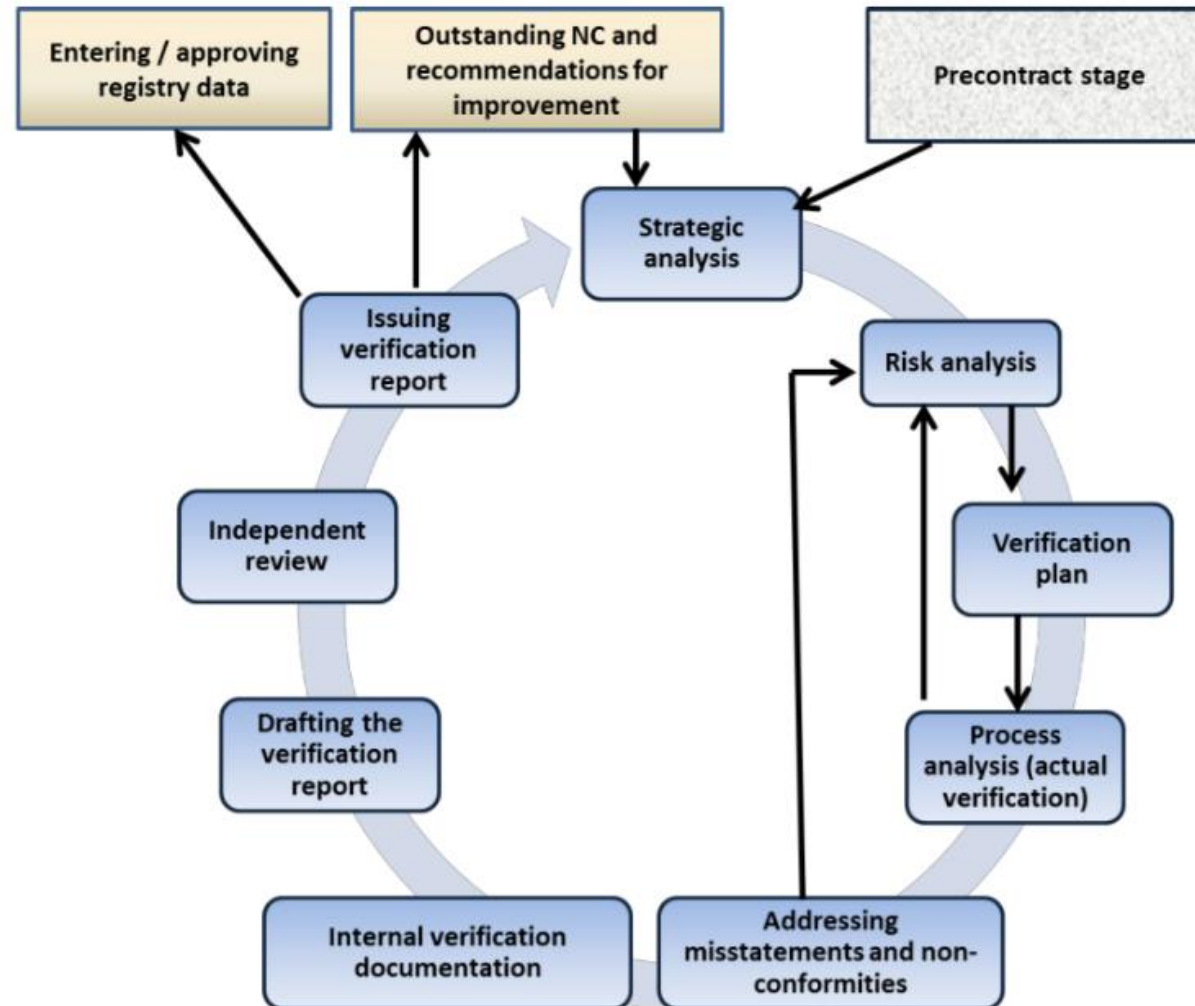
Belgrade, 28-29 June 2016

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Topics

- ✓ Strategic Analysis
- ✓ Risk Analysis
- ✓ Verification Plan
- ✓ Process Analysis
- ✓ Man-day indication

Verification Process



Strategic Analysis

Assess the operator's activities to understand its business and complexity

- ❑ Category of the installation to understand the size and scale of operator
- ❑ MP to understand the complexity of the installation & accounting process
- ❑ Specifics of the monitoring methodology and monitoring equipment
- ❑ Data flow, its control system and control environment
- ❑ Applicable materiality level
- ❑ Information from prior year verification if the same verifier verifies

Check whether:

- ❑ MP has been approved by the CA
- ❑ Changes have occurred to the MP and whether these have been approved or notified to the CA

Strategic Analysis

Operator must provide information to enable the verifier to plan and carry out verification (during strategic analysis and other points of time): e.g.

- ❑ All relevant versions of MP, ETS permit and AER
- ❑ Description of data flow activities, operators risk assessment, uncertainty assessment, procedures, sampling plan
- ❑ All changes to MP during the reporting period
- ❑ Improvement report
- ❑ Verification report from previous year
- ❑ All relevant correspondence between the operator and CA (temp deviations, permanent changes, approvals,...)
- ❑ Information and data sources used for monitoring and reporting
- ❑ Any other relevant information needed for planning and carrying out verification

(Prelim) Risk Analysis

✓ Some Definitions

☐ Inherent Risk(s):

means the susceptibility of a parameter in the operator's report to misstatements that could be material (individually or when aggregated with other misstatements), before taking into consideration the effect of any related control activities so assuming no internal controls exist

or in simple words – incident that could lead to a individually or aggregated to a material misstatement.

☐ Materiality level:

the quantitative threshold or point above which misstatements, individually or aggregated are considered material by the verifier.

☐ Control activities:

acts carried out or measures implemented (procedures) by the operator to mitigate inherent risks

☐ Control Risk(s):

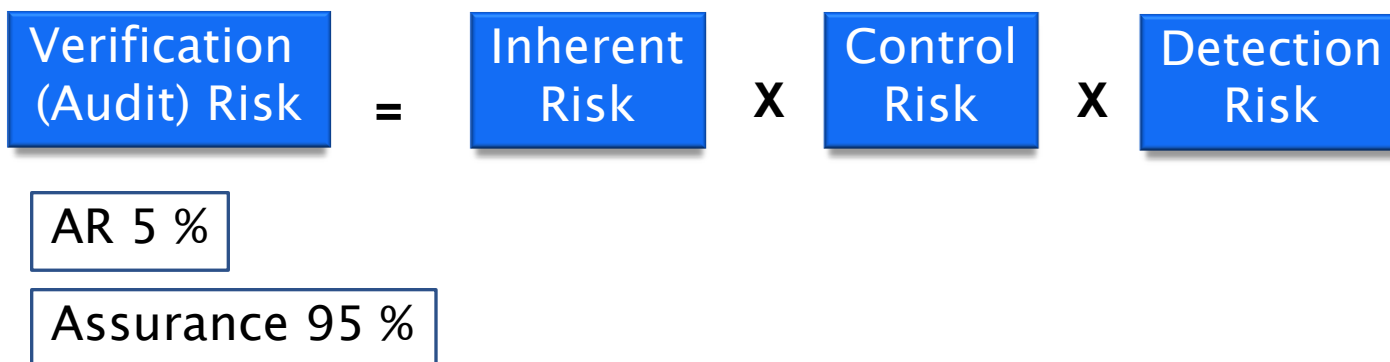
plausibility that control activity will not prevent or detected error

Verifier Risk Analysis & Conceptual Verification Model

❑ Art. 12: the verifier shall identify and analyze following elements to 1) design, 2) plan and implement an effective verification.

- (a) Inherent Risk(s)
- (b) Control Activities
- (c) Control Risk(s)

❑ Conceptual Verification/Audit Model:



Verifier Risk = probability issuing a inappropriate verification opinion

Objective is to minimise VR (art 13(4) AVR), one cannot eliminate verification risk

Conceptual Verification Model

$$VR_1 = IR \times CR \times DR$$

	case A	case B
Inherent Risk	High (100%)	Low (25%)
Control Risk	High (100%)	Low (25%)
Detection Risk	Low (5%) $0.05=1*1*0.05$	High (80%) $0.05=0.25*0.25*0.8$
	More evidence	Less evidence



Feeds into the verification plan, defines test plan & data sampling plan

$$^1VR=0.05$$

(Prelim) Risk Analysis

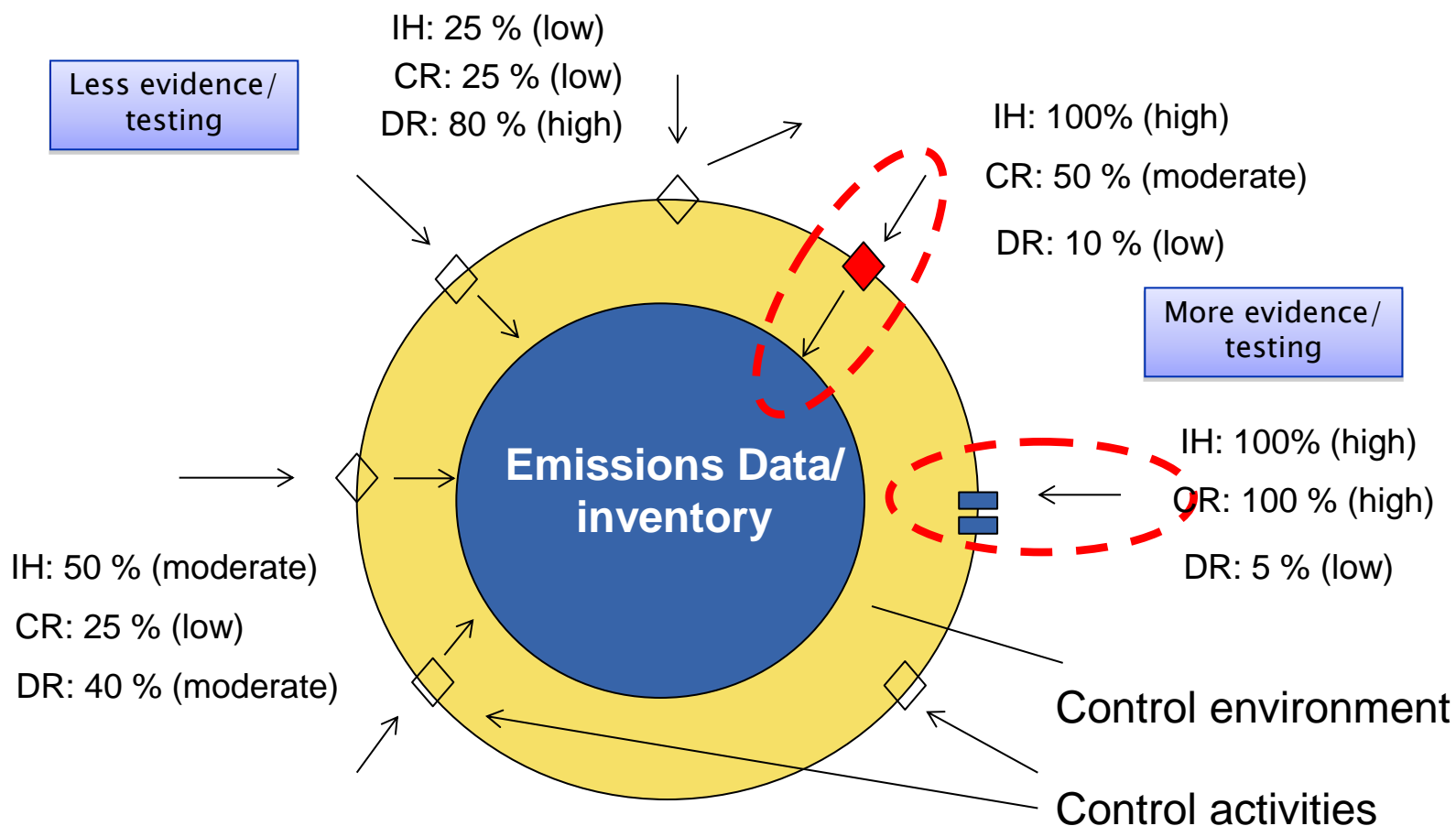
Steps in the risk analysis are interconnected → objective is to assess likelihood and impact of the risks to misstatements and non-conformities

- ❑ **Step 1:** Understanding nature, scale and complexity of the installation through consideration of:
 - ❖ information from the strategic analysis
 - ❖ in-depth analysis of information provided by the operator
 - ❖ the materiality level and if applicable, prior year information
- ❑ **Step 2:** Identifying and assessing the inherent risks (risks related to data flow assuming there were no controls)
 - ❖ through document review, preliminary analytical procedures, data management document review, interviewing key personnel and observation
 - ❖ determining magnitude of the inherent risks (impact and likelihood)

(Prelim) Risk Analysis

- ❑ **Step 3:** Preliminary analysis of the control activities to get an impression on the robustness of the control activities and risks
- ❑ **Step 4:** Identifying and assessing the control risks (risks related to the control activities)
 - ❖ through document review, interviews, observation, preliminary analytical procedures and items listed in step 3
 - ❖ relevant factors such as the way how the control activities and procedures are implemented, how responsibilities & competences are managed etc.
 - ❖ assessing the magnitude of the control risk (high, medium, low)
- ❑ **Step 5:** Determining the right level of verification risk
 - ❖ the verification risk should be reduced to achieve an acceptable low level to enable the verifier to state with reasonable assurance that the report is free from material misstatements

Illustration



RA is an iterative process !

VR=0.05

(Prelim) Risk Analysis

Risk analysis determines the extent of verification activities and checks to be carried out --> input in the verification plan

A change in the risk analysis may be needed:

- ❑ if additional risks are identified
- ❑ if there are lower risks than expected
- ❑ if findings in the verification process result in the need to revise the risk analysis
e.g. finding non-conformities or control activities that are not properly designed

When the risk analysis is changed, revision is needed of the verification activities and the verification plan

(Prelim) Risk Analysis

Exemplar RA and Sampling Plan

Table No. 1		Key source stream: Natural Gas 3A, 3B-4		Natural Gas 3A, 3B-4		insert unique ID or relevant evidence item from Evidence Index								
Activity	Description	Type of Risk	Relevant to this data flow?	Inherent Risk			Verifier Assessment of client control activities & effectiveness	Control Risk	Verification Risk (& so depth of Verification Activity Required)	Verification Test Plan & Sampling Plan (if applicable)	Results of Testing & Verification Comments X reference to Document List	Evidence Reference	Residual Risk Acceptable?	Finding transferred to Issues Log ?
(A)	(B)	(C)		Severity	Likelihood	Risk								
Measurement of flow	Installed equipment are appropriate?	Incorrect measurements	Yes	M	L	M	Annual calibration and maintenance regime in place	L	LOW	1) Test - Confirm appropriate meter specification, 2) Test - Inspection of meter in situ to check units/ components in place match underlying records, Sample - minimum of 50% permitted measurement instruments Fallback - If tests failed extend original sample by 10%	Inspected all OK. Supplier has provided a statement of accuracy. NOTE - Sampling programme established to ensure inspection rotated to cover all permitted measurement instruments across the trading period	C213-08 series	Yes	If a test is failed the verifier assesses and makes a judgement on the character and seriousness of the error, or failed sample; and on the basis of this decides whether to extend the sampling. KGN4 gives more information but essentially the extension of sampling should be in line with the verifier's assessed risk that as the first sample failed there should be no error in the new or extended sample. So for a high risk area it might be appropriate to select an additional sample of at least the same size as the original sample (eg original sample of 25% of the data universe and a second sample of 25% making a total of 50% of the data universe checked). For a lower risk area it may be acceptable to extend the original sample by a proportion (eg original Sample of 30% of the data universe, extended by a further 10% to give a total of 40% of the data universe checked). However, if there are errors in the second/extended sample, then further testing would need to be done until either 100% of the data universe is checked or the verifier is satisfied that they have identified all likely anomalies.
Measurement of flow	If applicable - deduction meters from this source are appropriate?	Incorrect measurements	No											
Measurement of flow	Installed equipment location is appropriate?	Incorrect measurements	Yes	H	L	H	Appropriate location & installation configuration - correct length of minimum straight run of pipe etc	L	MEDIUM	3) Test - Check - meter description corresponds to M&R Plan? 4) Test - Meter in appropriate location? Sample - as for (1) & (2) above Fallback - as for (1) & (2) above	Checked - all OK			
Measurement of flow	Installed equipment uncertainty acceptable?	Incorrect measurement, non compliance with tier	Yes	M	L	M	Input data to calculation stated to be checked and evidenced; and updated annually Calculation stated to follow recognised Standard or guidance	L	LOW	5) Test - Confirm inputs to uncertainty studies, assess any uncertainty calculations, check they are complete for Temperature & Pressure compensation Sample - all data inputs for Major source streams Fallback - No additional testing, failure is a NC issue	Data provided by supplier for M1 - checked all OK			
Measurement of flow	Equipment Calibration and Maintenance?	Incorrect measurement	Yes	H	M	H	Meter is responsibility of mains gas supplier under their calibration and maintenance regime	L	MEDIUM	6) Test - Assess adequacy of calibration and maintenance and actions taken. 7) Test - Confirm calibration in compliance with procedures Sample - as for (1) & (2) above Fallback - as for (1) & (2) above	Data provided by supplier for M1 - all OK Procedures in place to cover management of planned maintenance etc	C213-06-02	Yes	

Verification Plan

Risk analysis determines how to set up the verification plan, consisting of:

- ❑ The verification programme describing the nature and scope of activities, the time and manner in which it is to be carried out
- ❑ A test plan setting out the scope and methods of testing of the control activities and procedures for the control activities
- ❑ A data sampling plan setting out the scope and methods of data sampling related to data points underlying the aggregated emissions

Sampling data

- ❑ Sampling data is not always needed or appropriate
- ❑ If the data set is small, it is more efficient to check all data points
- ❑ If the risks are high or misstatements/ non-conformities are found it might be necessary to check the whole data population

Q&A

LUNCH

Back 13.03h

Verification Plan

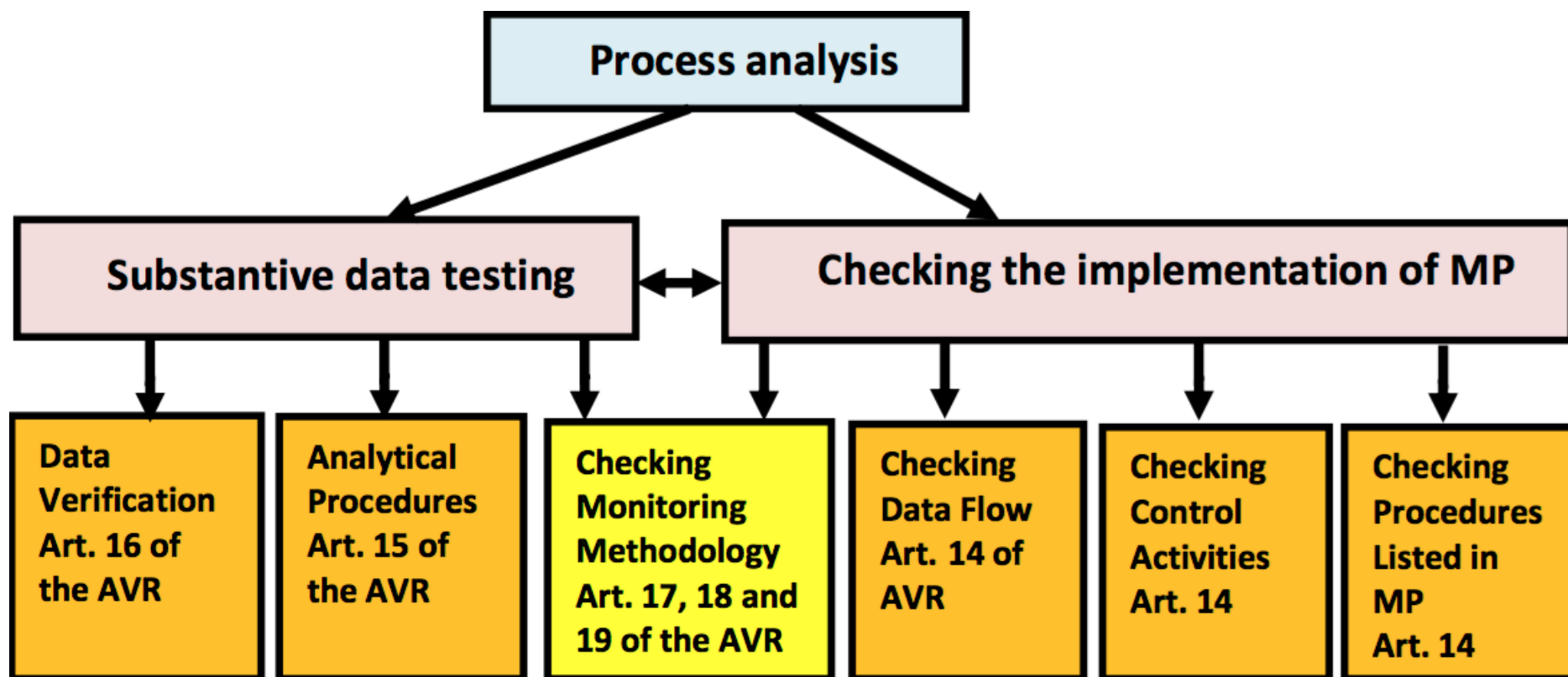
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Process Analysis



Process Analysis

Checking the data flow:

- ❑ Checking whether it meets actual practice (by data trail)
- ❑ Tracing the reported data back to the primary sources
- ❑ Checking primary sources & each process step
- ❑ Checking the persons that are responsible for the data flow
- ❑ Checking the management system (manual or IT input)

Checking the control system:

- ❑ Assessment of the operator's risk assessment
- ❑ Assessment of the control activities
 - ❖ checking the establishment & effectiveness of the control activities
 - ❖ checking their documentation, implementation & maintenance

Process Analysis

- ❑ Key questions when checking the control activities:
 - ❖ are the control activities functioning properly?
 - ❖ what is the frequency of the control activity?
 - ❖ are the control activities carried out manually or electronically?
 - ❖ are the control activities implemented correctly? Is the “4 eyes principle” applied?
 - ❖ who is responsible, and does this person have the right competence?
- ❑ Different types of testing: inquiry, observation, inspection and re-performance
- ❑ Already tested control activities do not relieve verifiers from carrying out their own checks, in particular ETS adaptations, recommendations
- ❑ EU Guidance on how to check the types of control activities in KGN II.3

Process Analysis

Checking the procedures listed in the MP on:

- ❑ Presence and proper documentation of the procedures
- ❑ Whether the procedures contain the information mentioned in MP
- ❑ Whether the procedures are implemented & up to date
- ❑ Whether the procedures are applied throughout the reporting year
- ❑ Effectiveness of the procedures to mitigate the inherent and control risks

Checking the operator's evaluation of the control system:

- ❑ Assessing the quality of the operator's evaluation: e.g. internal audits
- ❑ Checking the proper documentation of the operator's evaluation of the control system and follow-up of prior findings

Process Analysis

- ❑ Analytical procedures comprises of:
 - ❖ assessing the plausibility of fluctuations & trends over time or between comparable items
 - ❖ identifying immediate outliers, unexpected data, data gaps
 - ❖ assessing the impact on the verification if outliers, unexpected data & data gaps/ fluctuations are found
- ❑ Deviating numbers or unexpected relationships may assist in the identification of risk areas and enable tailoring further verification activities
- ❑ In case of inconsistencies, supporting evidence is asked from the operator → verifier assesses the impact on the verification plan and further verification
- ❑ Analytical procedures are usually applied throughout the verification process (from risk analysis to finalisation of the verification)

Process Analysis

What does data verification entail?

- ❑ Checking the correctness of the installation boundaries and the completeness of source streams and emission sources
 - ❖ checking whether the MP and the AER reflect the actual situation
 - ❖ checking the categorisation of the installation and the source streams
 - ❖ checking for possible data gaps or double counting
- ❑ Checking accuracy & reliability & completeness of the data: e.g.
 - ❖ cross checking with internal and external data sources
 - ❖ checking the readings from measurement equipment
- ❑ Checking consistency the reported data with primary source data: e.g.
 - ❖ tracing the data back to primary source
 - ❖ checking extraction of the emissions report and the transfer of data

Process Analysis

Checking correct application of monitoring methodology in the approved MP

- ❑ Application in line with the approved MP
- ❑ Checking spreadsheets & software
- ❑ Checking totals & subtotals in formulae
- ❑ Checking tiers & corresponding requirements
- ❑ Checking the correct use of units and types of metering

Checking the specifics of the monitoring methodology (described in KGN II.3)

- ❑ How to check the activity data depends on the type of determination (e.g. checking invoices, meter readings, documentation of data, cross-checks)
- ❑ How to check calculation factors depends on the type of determination (e.g. default values or analysis)

Process Analysis – Sampling Plan

Verifier must check whether:

- ❑ Sampling plan includes the items specified in MRR and COM guidance
- ❑ Sampling is carried out in accordance with sampling plan as approved by CA
- ❑ Sampling plan has changed, and if applicable, the changes were approved
- ❑ Sampling plan is still appropriate and can deliver the most representative samples for current circumstances
- ❑ There is a central reference document if elements of the sampling plan are distributed across different departments and operational procedures
- ❑ Relevant personnel is trained and competent
- ❑ Procedure underlying the sampling plan is documented, implemented, maintained and effective
- ❑ The sampling is being consistently carried out in accordance with the sampling plan approved by the CA

Uncertainty Assessment

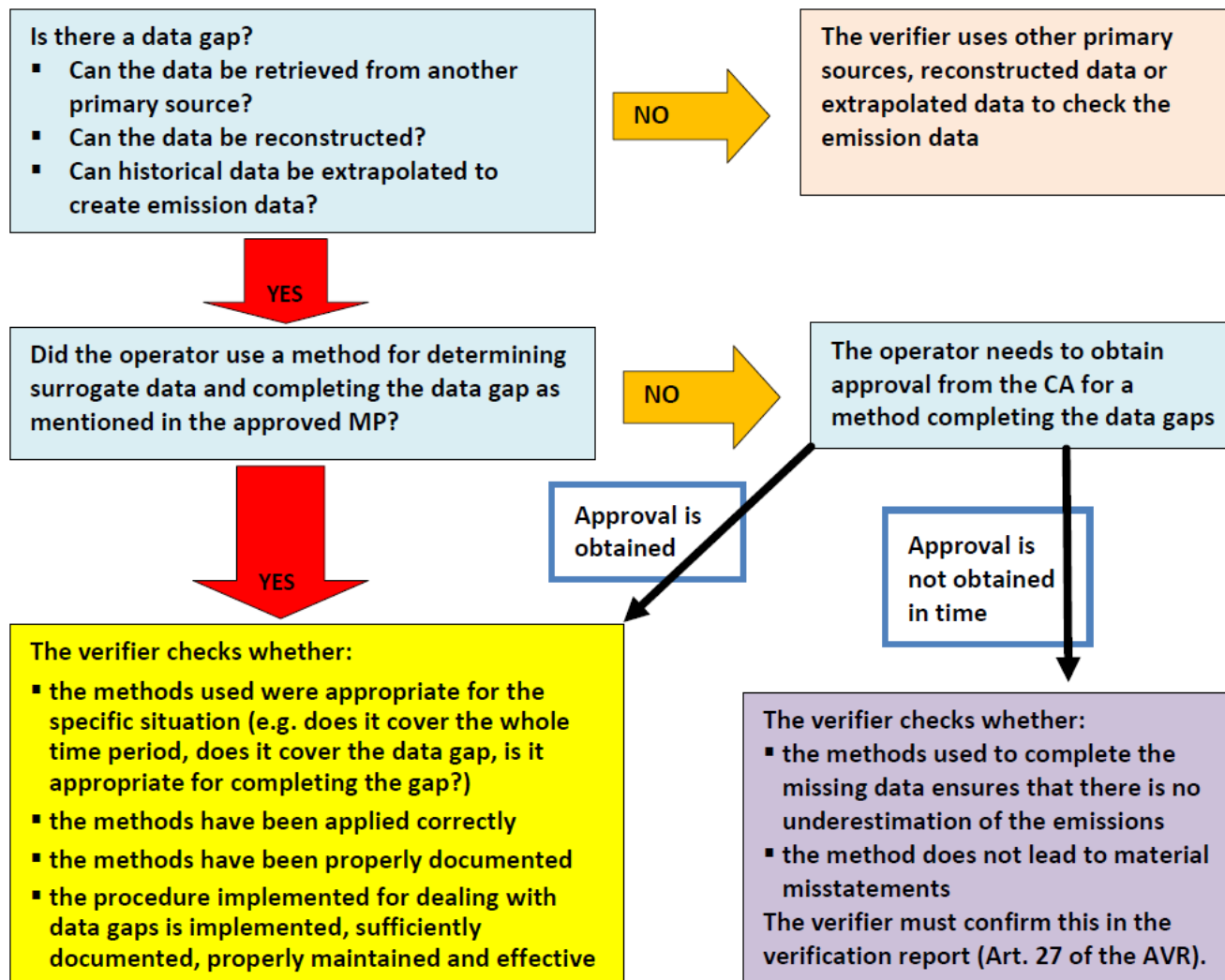
- ❑ Verifier must check validity of the information used to calculate the uncertainty levels as approved in MP (also applies for small installations)
- ❑ Type of information to be checked depends on the methodology, type of measurement instrument and approach used to calculate uncertainty
 - ❖ instrument under operator's control covered by LMC → check of the verification certificate and the specifications from the institute
 - ❖ instrument under operator's control using route 2a/b → check of manufacturer's specifications, LMC specifications and operator's procedures to ensure data are measured against the standards
 - ❖ instrument under operator's control using an extensive uncertainty assessment → check that all information is used in the calculation
 - ❖ instrument outside operator's control → check the evidence the operator has obtained from the trade partner (e.g. calibration/ specifications)
 - ❖ use of 1/3 of uncertainty value in the determination of calculation factor → verifier checks input into excel sheet (historical data)

Uncertainty Assessment – Fall back

Verifier must check whether:

- ❑ The operator has carried out an assessment and quantification of the uncertainty to make sure that required overall uncertainty is met
- ❑ Validity of the information used to assess the uncertainty
- ❑ Overall approach used for the uncertainty assessment is in line with the ISO guide to expression of uncertainty in measurements (JCGM 100:2008) or another equivalent internationally accepted standard
- ❑ Evidence is provided that the conditions for applying the fall-back methodology are applicable

Data Gaps



Sustainability of Biofuels/liquids

The verifier must check:

- ❑ Completeness and delineation of the biomass source streams
- ❑ Whether source streams in installation are fossil source streams, mixed source streams, biofuels/bioliquids meeting sustainability criteria etc.
- ❑ Delineation of source streams (whether batches of biomass source streams should be considered as separate source streams)
- ❑ Demonstration of compliance with sustainability criteria →
 - ❖ is the certificate issued by a national system or by a COM recognized system?
 - ❖ is the certificate valid?
 - ❖ does the scope of the system/ scheme cover all criteria?
 - ❖ is the geographical scope of source streams in line with scope identified in the systems?

ISO17025 Accreditation

The verifier must check whether:

- ❑ Lab is accredited according to EN ISO /IEC 17025 (certificate)
- ❑ Analytical tests as listed in the contract have been carried out in line with the MP
- ❑ Scope of the lab's accreditation covers the required test methods and sample analyses in the approved MP
- ❑ If the verifier discovers that the lab is not accredited or the lab's accreditation does not cover the required methods and analyses → the verifier will:
 - ❖ carry out additional checks on quality management and technical competence
 - ❖ assess the impact on emission data and the opinion statement
 - ❖ report this as a non-conformity in verification report

CEMS

- ❑ Verifier checks the data flow, control activities and procedures in similar way but will also focus on CEMS specific issues (e.g. location stacks)
- ❑ Verifier carries out some CEMS specific checks on application of EN 14181 (application of QALs and AST)
- ❑ Verifier carries out CEMS specific checks on flue gas flow: e.g.
 - ❖ checks on standards applied
 - ❖ checks on whether flow measurement is representative
 - ❖ completeness of hourly data and substitution data for missing hours
- ❑ Verifier carries out quality assurance control checks on peripheral measurements and calculations
- ❑ Verifier carries out similar checks in substantive data testing but will also focus on CEMS specific issues: e.g.
 - ❖ checks on whether correct substitute data have been used to fill gaps
 - ❖ checks on calculation if the flow rate is calculated

Transferred CO₂

- ❑ There are differences between the measured values at transferring and receiving installations and whether these differences can be explained by uncertainty measurement systems
- ❑ Correct arithmetic average of measured values have been used in the emissions reports of both installations
- ❑ If measured values at the transferring and receiving installation cannot be explained by uncertainty → verifier must check whether:
 - ❖ adjustments were made to align the differences
 - ❖ adjustments are conservative and do not lead to overestimation of transferred CO₂
 - ❖ the CA has approved the adjustments

Time Allocation

- ☐ Article 9(1) of the AVR outlines which factors have to be taken into account when allocating time.
- ☐ The time allocated is not a fixed number. If during the detailed verification the verifier finds that additional time is needed to properly carry out the necessary verification activities, the time allocation in the contract must be adjusted accordingly. The contract must have a provision for this adjustment.
- ☐ Factors influencing time (non-exhaustive):
 - ☐ Size (A,B or C), hence materiality level 2%/5%
 - ☐ Complexity/Activities/#Sources/# Streams
major/minor/deminimis /Measurement Equipment/Samples/lab accreditation, GHG gasses, type of monitoring, CEMS,...
 - ☐ Culture and organisation, adherence to procedures
 - ☐ ...

Time Allocation

□ Guidance table (NAB) use only.

Step I – Number of emission sources	Points to score for step I
1 to 3	1
3 to 6	2
More than 6	3

Step II – Number of source streams	Points to score in step II
1 to 3	1
3 to 6	2
6 to 9	5
More than 10	10

Step III – Source stream type	Points to score in step III
Only commercial standard fuels or biomass where the biomass fraction is 97% or more in accordance with Article 38(4) of the MRR	1
Only liquid fuels, biomass where the biomass fraction is 97% or more in accordance with Article 38(4) of the MRR ⁴ or natural gas	4
Any combination of fuels (liquid, solid and/or gaseous fuels and materials, mixed biomass)	8

Time Allocation

□ Guidance table (NAB) use only.

Step IV – Total annual emissions	Points to score in step IV
Annual emissions equal to or less than 25,000 tCO _{2(e)}	0
Annual emissions equal to or less than 50,000 tCO _{2(e)}	1
Annual emissions equal to or less than 500,000 tCO _{2(e)}	8
Annual emissions more than 500,000 tCO _{2(e)}	15

Step V – Level of complexity and control	Point to score in Step V
Very low complexity and good controls in place	2
Moderate complexity and good control	8
High complexity but good control	16
Moderate/High complexity and poor control	30

Sum of the points allocated per step	Up to 8	8-23	24-35	36-50	>50
Minimum verification man-days	1.5	2-3	4-5	6-7	8-9

Step VII – Number of verifications carried out for the same operator	Reduction time
1 st Verification	No time may be subtracted from the total number of days allocated
2 nd verification in a row	0.5 to 1 day may be subtracted from the total number of days allocated or the minimum value of the indicated range

Information

Where to find more information?

Regulation No. 600/2012 (MRR)

<http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:181:0001:0029:EN:PDF>

Guidance Documents on European Commission's website

http://ec.europa.eu/clima/policies/ets/monitoring/documentation_en.htm

Any Questions?

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