

Training Verification Emission Reports ETS 2010-2012 Croatia

Zagreb 19-20 January 2011

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I. Introduction

Course Objective

To make the verifiers familiar with the knowledge and skills required to undertake work to verify Emission Reports for the purpose of EU ETS 2010-2012.

Key Learning Objectives

■ Awareness

- Enable Verifiers to refer to the basic required and relevant EU ETS documentation

■ Knowledge

- Explain and describe to Verifiers the role of the verification process leading to a qualified verification statement

■ Practical Topics

- Key principles of the verification process
 - Risk and strategic analysis
 - Planning the verification
 - System en data analysis
 - Tools and techniques for verifiers
 - Completing the verification

II. Programme

Agenda 19th January 2011

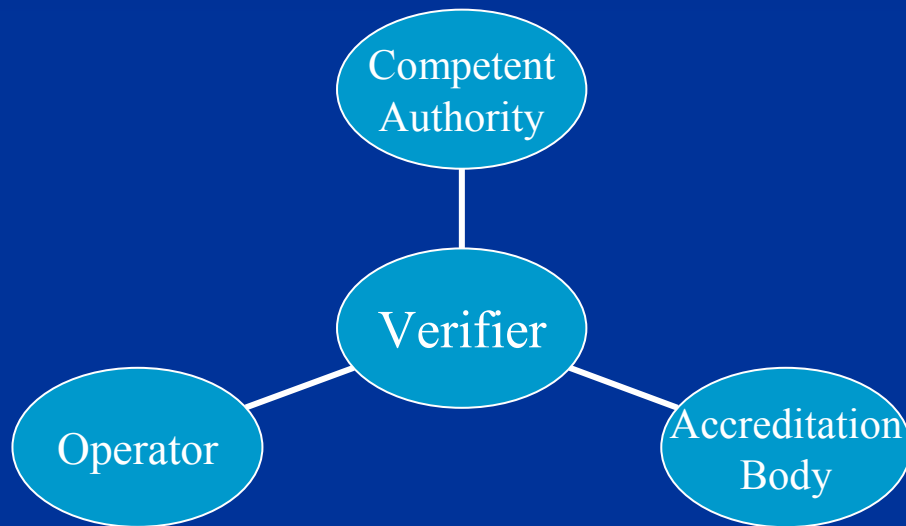
- 9.00 Introduction and welcome of participants (JJ)
- 9.20 Program for the coming two days (JJ)
- 9.40 Rules/regulations for ETS verification (JJ)
- 10.00 General introduction into the verification process (IB)
- 11.30 Practical issue: strategic and risk analyses (JJ)
- 12.30 Lunch
- 13.30 Basic principals of verification and emission report (IB)
- 14.30 Basic requirements and competences for the verifiers (JJ)
- 15.30 Internal Quality management verifier (IB)
- 16.00 Discussion, Recap and introduction to Day 2 (JJ/IB)
- 17.00 Closure

Agenda 20th January 2011

- 9.00 Review of main learning points previous day (JJ)
- 9.30 Planning and communication (IB)
- 10.30 Practical issues system verification (JJ)
- 11.30 Tools and techniques for data verification (IB)
- 12.30 Lunch
- 13.30 Approach simple and complex installations (JJ)
- 14.30 Case-study internal verification documentation (IB)
- 15.00 Case study internal review (JJ)
- 15.30 Discussion and course evaluation (JJ/IB)
- 17.00 Closure

III. Rules and Regulation for ETS verification

Verifier and roles of various parties involved



- Verifier & Operator
 - Contractual basis
 - Operator is customer
- CA & Verifier
 - Keeps records of verified emission data
 - May request verification documentation
- AB & Verifier
 - Ensures accreditation of verifier accordance specified requirements
 - Keeps list of accredited Verifiers

Verifier & Operator

- Operator is the Customer
- Basically there is a contractual relationship
- Both parties aim to issue a verification report
- Verifier is requested by CA and AB to maintain records of the complete audit trail

Main regulations ETS verification

- Directive 2009/29/EC
 - Verification requirements in art.15 and annex V
- MRG
 - Verification demands in Par. 10.4
- Commission decision 2007/589/EC
 - Reporting format for emission report in Par. 14
- EA-6/03: 2010
 - Prescribes requirements for verifiers and verification process
- National Allocation Plan
 - Principles and methodologies for determining total amount of free allocation

Reporting format Emission report

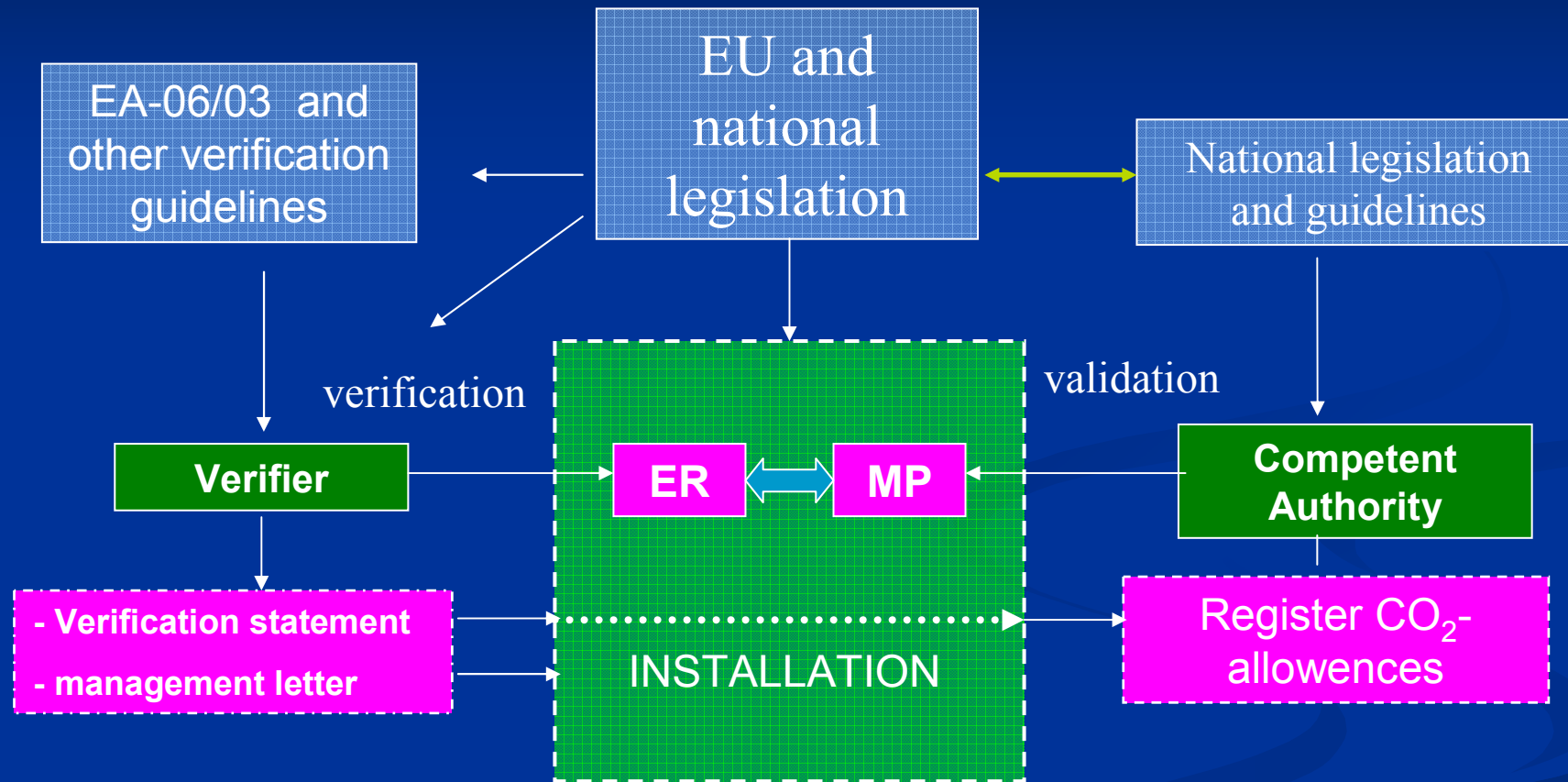
1. Identification of installation
 - Name of Company & Operator
 - Installation, name, permit, address etc.
 - Contact Person
 - Reporting year
 - Type of Annex I activities
2. Overview of activities
 - Emissions of Annex I activities
 - Memo items
3. Combustion emissions
 - Types of fuels
 - Units, Value, Tier applied
4. Process emissions
 - Types of materials
 - Units, Value, Tier applied
5. Mass-balance approach
 - Unit used, Value, Tier applied
6. Measurement approach
 - Units, Value, Tier applied, Uncertainty

Electronic Emission reports

- No legal obligation for such format
- For simple installations
 - Digital application available
 - Requirement to pass decision tree criteria
 - Maximum 5 activities
 - No process emissions
- For complex installations
 - Preferably Excel calculation sheets to be provided of overall emission calculation
 - For each sub-activity relevant data on types of fuels, process emissions and materials used and units, values and tiers applied

IV. Introduction verification process

Parties involved/delineation tasks



Validated MP is base for verification

Operator

Responsible for:

- a correct, up to date and validated Monitoring Plan
- a correct yearly emissions report based on the up to date approved Monitoring Plan.
- Hiring a accredited verifier

Verifier (EA 6/03)

Responsible for the verification of the yearly emission report.

Aims at reaching a verification opinion whether:

1. The data submitted in the emission report is fairly stated (i.e. that the report is free from material misstatements)
2. There is conformance with the EU ETS permit and the approved MP
3. Where appropriate, the emissions have been monitored in accordance with the MRG or national implemented legislation based on MRG

No validation/advice, only verification.

Competent Authority

- Approves (validates) the monitoring plans and (where necessary) changes in the plan.
- Checks whether the verified emissions reports are send in 31st of March the latest.
- May check the verified emissions reports for compliance and control of quality of verification.
- Gives sanctions in case of non compliance

Steps in verification process

1. Pre contract stage

2. Verification assessment

3. Reporting

4. Review of verification process

5. Issuing verification report

6. Entry emission figure in Registry

Step 1: Pre-contract stage

Assessing whether it is possible to undertake the verification activities for the specific installation.

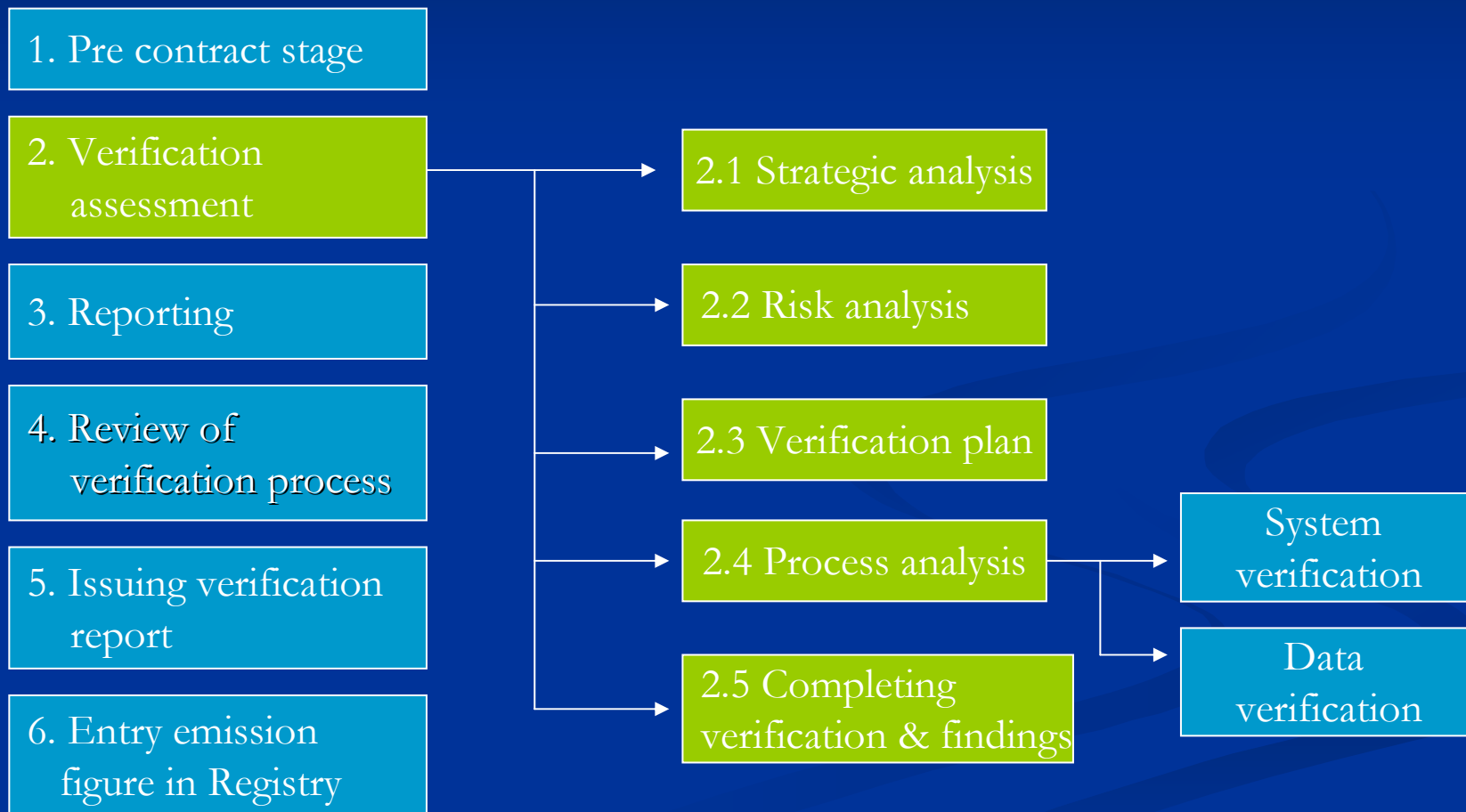
This means:

- evaluating the risks involved for the verifier to undertake the verification activities within a particular installation site ;
- assessing whether the operator has provided the verifier with sufficient information
- Checking conflict of interest
- Competency needs analysis and team selection;
- specifying the contract conditions for verification;
- allocating time to verification activities .

The results of the pre-contract stage need to be documented

Step 2: Verification assessment

Concerns the actual verification



Step 2: Verification assessment

2.1 Strategic analysis

Aim: Preparation for risk analysis:

Verifier assesses the likely nature, scale and complexity of the verification

The verifier has to check a.o.:

- Whether an approved monitoring plan is available
- Whether the MP has been changed and these changes have been notified to/approved by the competent authority
- The nature, scale and complexity of relevant equipment and processes
- The data acquisition and handling activities
- the existence of a control environment/control systems
- the availability of information from databases
- the organisational environment

The results of the strategic analysis and other information assembled during strategic analysis shall be recorded in the internal verification documentation

Step 2: Verification assessment

2.2. Risk analysis (1)

Aim: Assess the likely level of risk of a material misstatement or material non-conformity in the emissions report.

Verifier shall:

- Analyse information available to determine where the greatest levels of risks to misstatements are.
- The verifier shall at least consider:
 - relevance and proportional size of emissions from different source streams
 - adequacy of management systems, data flow activities and control systems
 - complexity of operations;
 - the approved monitoring plan;
 - relevant evidence from previous verification engagements;
- Reduce the risks to an acceptably low level to obtain reasonable assurance, through design and implementation of the verification process
- Document the results of the risk analysis

The Strategic and risk analysis can often be combined

Step 2: Verification assessment

2.2. Risk analysis (2)

Factors determining the verification risk (the risk that the verifier expresses an inappropriate verification opinion) :

- Control risk

The risk that the control system is too poor to detect and correct a possible material mistake on a timely basis in the emission report

- Detection risk

The risk that the verifier will not detect a material mistake or non conformity

- Inherent risk

A risk which is impossible to manage. The risk that exists in each line of business without consideration of the level of management control in place.

Step 2: Verification assessment

2.3. Verification plan

Aim: Effective plan for executing the verification.

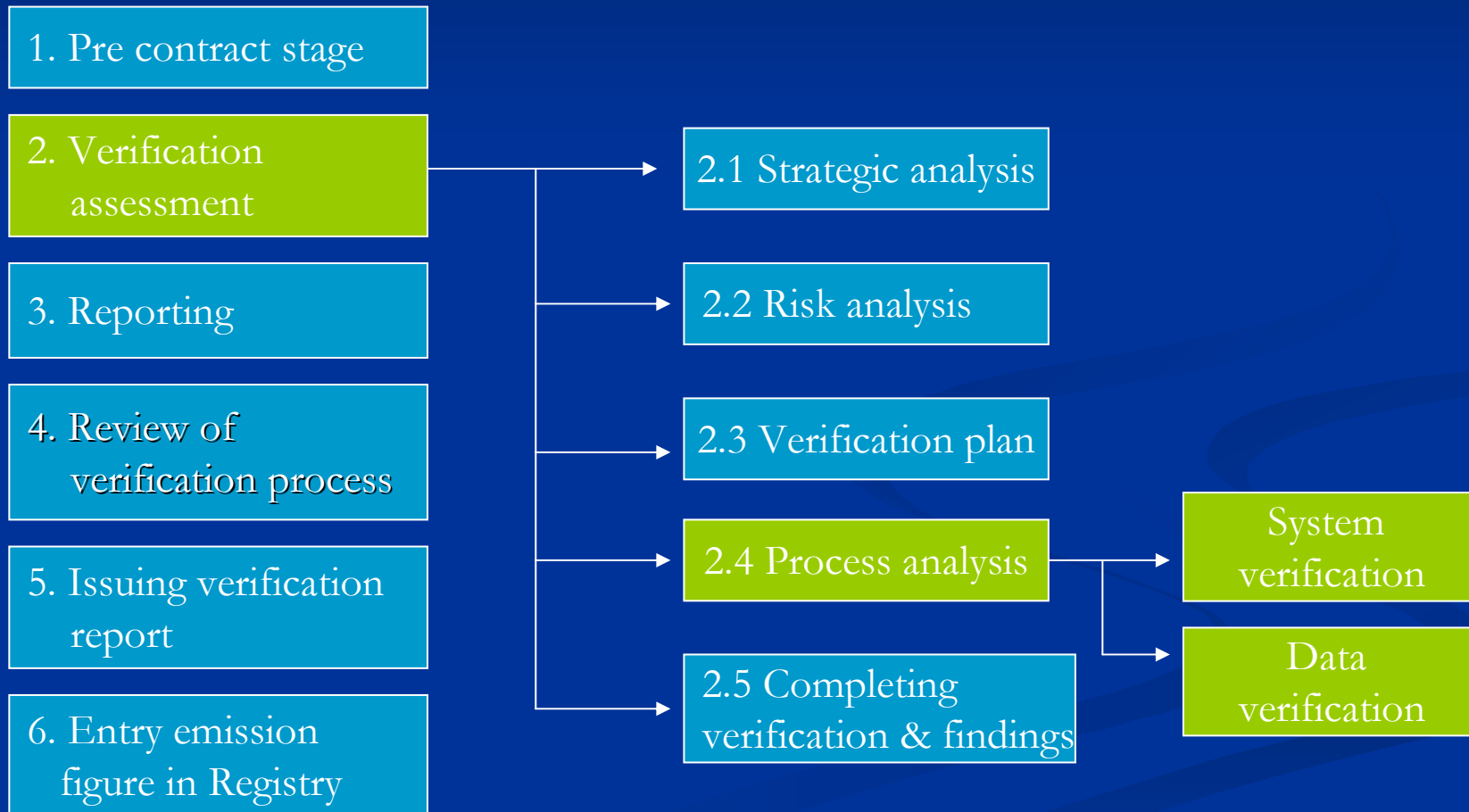
Based on results of strategic and risk analysis

Consists of:

- Verification programme: **how** verification takes place (all the activities for the execution of the verification)
- Data sampling plan: **what** verification will involve (data sampling strategy, selection data to verify)
- Activities on site during site visits and off site
- Checking installation boundaries
- Assessment of conformance with the approved MP

Step 2: Verification assessment

2.4 Process analysis



Step 2: Verification assessment

2.4. Process Analysis (1)

Aim: Execution of the verification plan as base for opinion

Main part of verification

- System verification
(Pre) investigation aimed at the actual implementation of the system of measuring and data handling in conformity with MP and internal control and quality assurance
- Data verification
 - Arithmetical control of the effectiveness of the system and the reported figures
 - Extend data verification is based on results system verification
- Separate or combined

Step 2: Verification assessment

2.4. Process Analysis (2)

Themes system verification

- Support from ISO/EMAS systems
- Internal audits
- Documentation (MP, procedures, work instructions)
- Internal control and corrective actions
- Outsourcing activities
- Transparency tasks, responsibilities
- Competence of employees
- Presence and calibration of Meters and (measuring/monitoring) equipment
- Inspection and maintenance
- Correct Use/determination of emission factors/caloric values
- Computer systems (data gathering/handling/calculation)

Step 2: Verification assessment

2.4. Process Analysis (3)

Starting points

- Reasonable level of assurance
- Materiality
 - cat A en B installations: 5%
 - cat C installations: 2%

Control environment

- Risk level
- conformity with MP
- functioning systems
- Internal control

Depth/extend data verification

- % emissions
- Number of data (trails) and data checks

Verification assessment

2.4. Process Analysis (4)

Approach data verification:

- Data checks
 - Line (data trail) investigations
(checking complete data trail from reported data till source data)
 - Cross checks/trend analyses
(comparing data with other data, based on plausible relations)
 - Spot check sampling
(risk driven or at random)
- Significant failure of selected data shall result in testing additional data
- If necessary: change verification plan
- Results of data verification shall be documented

Step 2: Verification assessment

2.4. Process analysis (5)

Site visits

- The verification shall normally be performed on-site(s) to assess monitoring systems including the operation of meters, conduct interviews, and collect sufficient information and evidence
- The verifier may only waive a site visit (EA-6/03) if:
 1. the operator has approval from the competent authority for that year, or;
 2. the competent authority has approved a list of criteria and the verifier has assessed that these criteria for waiving the site visit apply
- The waiving of site visits shall be justified and recorded in the internal verification documentation
- Number of site visits based on results strategic/risk analyses
- Verifier decides between separate and combined system- and data verification and when/how many of site visits:
Good balance between off-site and on-site verification activities

Step 3: Reporting

■ External

- Verification report/statement for the operator to send to Competent Authority (with the emission report)
- Management letter (not mandatory, but nice to have for operator). In Management letter:
 - further explanation of findings
 - options for further improvement

■ Internal

- Verification documentation

Step 4: Review of verification process

Objective: to ensure that the verification process is conducted in accordance with the verifier's documented procedures

- The reviewer should be a competent person who has not taken part in the verification process and have an appropriate level of knowledge and experience sufficient to evaluate the verification processes
- The scope of the review should encompass the complete verification process
- Functions of review:
 - to look for technical errors or omissions
 - check whether the verification is carried out in accordance with requirements
 - the proof reading function (to correct simple errors, number reversals etc.)
 - The justification for the decision to issue the verification report or to give a verification opinion that the emissions report is satisfactory or not.

Step 5/6: Issuing verification report and entry of emission figure in the Registry

- The verifier shall submit a verification report to the installation
- The Installation shall submit it (together with the verified emission report) to the Competent Authority,
- The management letter is only meant for the installation

- Operator has to appoint verifier in Registry and may (depending on National legislation) input the figures.
- Verifier may input or approve the figures, according to national legislation.

V. Practical issue: strategic and risk analysis

Strategic and risk analysis

■ Strategic Analysis

- Overview required of all installation's activities
- Availability and access to significance emissions data

■ Risk Analysis

- Evaluate reliability of data from each source
- Identify high-risk sources, checking emission factors & calculations (materiality)
- Verify risk control methods reducing uncertainty

■ Verification plan

- Specify issues relevant to verification activity

Strategic & risk analysis 1

- Assessment of nature, scale and complexity of the verification activity by document review and interviews
- Starting point will be to ensure that an up to date monitoring plan is available which has been approved by Competent Authority

Strategic & risk analysis 2

- Approved monitoring plan
- Changes to the approved monitoring plan
- Changes notified or approved by CA
- Nature ,scale and complexity of equipment and processes that have resulted in emissions
- Data acquisition and handling activities
- Control systems of the installation
- Existence management systems that covers data handling and recording system
- Status of operational, maintenance and data accounting systems

Strategic & risk analysis 3

Develop a plan to check that emission report is based on an approved monitoring plan

Audit plan should cover at least following items

- Data acquisition and handling
- Control systems
- Control activities
 - Procedures and responsibilities
 - Quality assurance
 - Reviews and validation of data
 - Records and documentation

Strategic & risk analysis 4

Risk levels	High risks -Major shortcomings (in MP, systems, non conformities) - Poor internal control -Important changes)	Low risks -Transparant, up to date MP -Effective, transparant systems - Effective internal control -No remarks in last MR
(very) complex -Complex processes and calculating methods -Proces emissions -internal fuels -Complex systems -Many sources	A	C
Not complex -Simple methods - standard fuels - no process emissions - simple systems - limited sources	B	D

Case study on risk analysis

- Case: Prepare an overview of the main elements to be part of the verification plan, depending on the A, B, C or D type risk level of the installation. (Separate system verification yes/no , site visit yes/no, etc.)

Case study on risk analysis of Monitoring & Data handling

- System verification aspects
- Ranking of emission sources
- Parameters which need validation
- Assessment of aspects which need special attention
- Overall verdict

System Verification

- | | |
|-----------------------------|----------------------------|
| 1. Management systems | 7. Competencies |
| 2. Internal Audits | 8. Means |
| 3. Document control | 9. Inspection, Maintenance |
| 4. Registers | 10. Calibrations |
| 5. Outsourcing | 11. Computer systems |
| 6. Tasks , Responsibilities | 12. Others |

Emissions from activities



Coverage 40-80% of total emissions depending on risk assesment

Parameters which need validation

Parameters

- Fuel flow
- Net caloric value
- Activity data
- Emission factor
- Oxidation factor
- Load calculation



Aspects

Aspects which require special attention based on findings of risk assesment and outcome of system verification

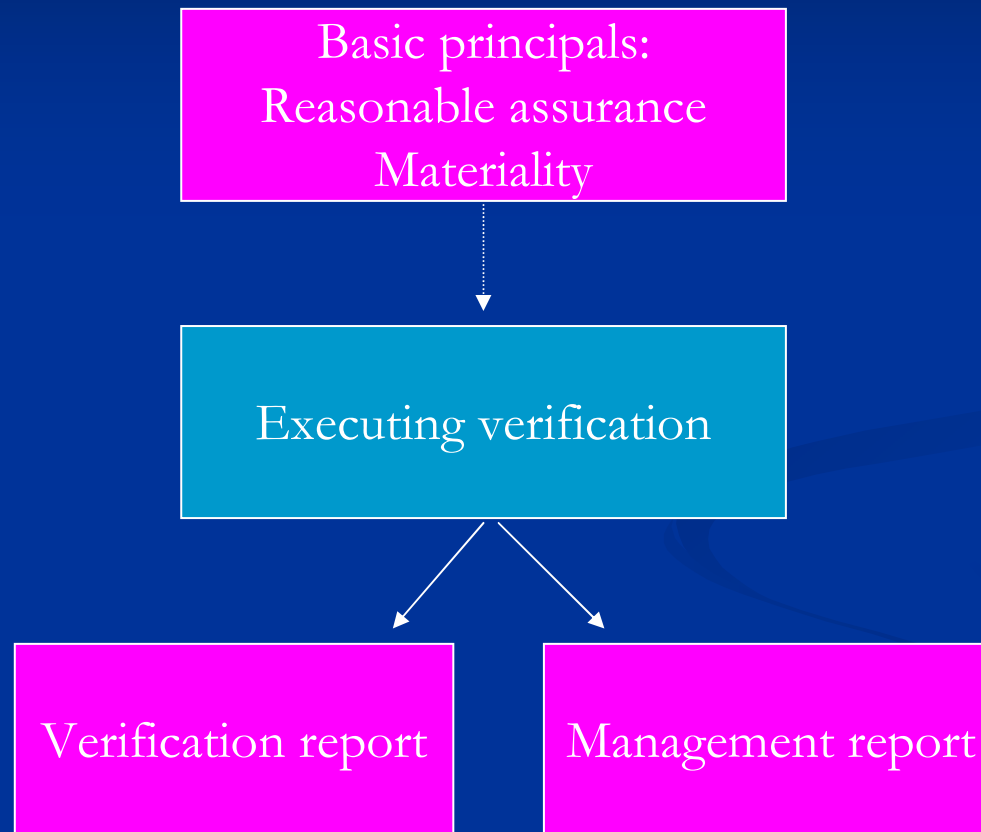
- | | |
|-------------------------|------------|
| Availability of records | 4, 11, 12 |
| Random check on records | 4, 11, 12 |
| Calculations | 3, 11 |
| Data handling | 11 |
| Data storage | 8, 9, 10 |
| Maintenance | 8, 9, 5 |
| Faulty meter readings | 4, 9, 12 |
| Corrections | 4, 12 |
| Calibrations | 10 |
| Internal Control | 1, 3, 4, 6 |
| Management systems | 1, 3, 6 |

Verdict

- OK, Correct
- Observation
- Remark
- Shortcoming

Data Handling Verification

VI. Basic principals of verification and verification report

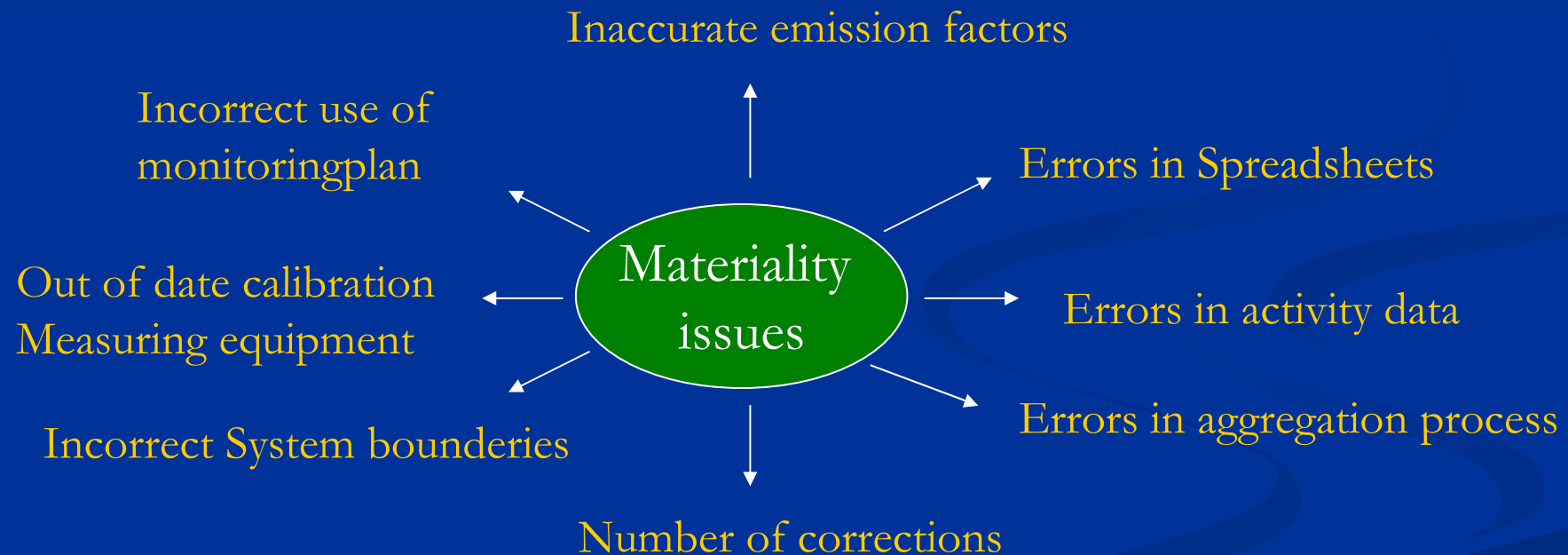


Reasonable level of assurance

- Verifier aims to provide a verification report with a reasonable level of assurance: a high but not absolute assurance
- Reasonable level of assurance means that the verifier states in the verification report that the data in the emission report are free from material misstatements and no material non-conformities exist.
- Positive wording in the verification report *“it was found that the emission figures are materially correct”*
- Level of assurance relates to depth and detail of verification activities to support the verification statement
- Other option (not applicable for ETS verification): limited level of assurance, resulting in other wording in the verification report: *“it was not found that the emission figures are not materially correct”*

Materiality

- Materiality threshold according to MRG (2% for C installations, 5% A and B)
- This means confidence in at least 98% resp. 95% of the reported emissions
- Concerning quantitative errors and non conformities, for example



Materiality is relevant for determining the nature, timing and extent of the verification

Verification report

- Verification report
 - criteria for delivery
 - content of report
- Example

Criteria positive verification statement

A positive verification report will be given if:

- The emission report is established in accordance with a validated and up to date monitoring plan **and**
- No mistakes and non conformities of material interest are found **and**
- Sufficient control information is available to come to an opinion.

What if...

- A material omission is found
- One or more non material mistakes are found
- The emission of one of the CO₂- sources is determined otherwise than described in the MP
- A source was found that is not mentioned in the MP and is not taken into account in the emission report.
- The MP is not clear about the way of calculation

A material omission is found

- With material omission(s) in the emission report no positive verification report can be given
- To give a positive verification report:
 - The omission(s) have to be corrected by the operator
 - The verifier has to evaluate what the found omission(s) can mean for the reliability of other reported data (that were not verified) and the material correctness of the total reported figure. This may mean that more data have to be verified (and more corrections have to be made).

One or more non material mistake(s)

- In principal in case of non material mistakes a positive verification report can be given
- However the starting point is/should be that mistakes have to be corrected by the operator (if possible)
- If this is not possible (or not done) a remark has to be made in the verification report.
- Also here the verifier has to evaluate what the found omission(s) can mean for the reliability of other reported data, (that were not verified) and the material correctness of the total reported figure. This may mean that more data have to be verified (and corrected)

Other method than in MP

- The first option is to see if this omission can be corrected by the operator by recalculating in conformity with the MP.
- Second option is to ask approval for this other method by the competent authority if
 - the used method is as good as or better than the method in the MP)
 - there is enough time for approval
- If these both options are not possible, the verifier has to evaluate what the consequences are or can be for the materiality
 - If this could possibly lead to a material deviation: no positive verification report can be given
 - If the verifier concludes that this will not lead to a material deviation a positive verification report can be given with a remark.
 - The verifier is in principal not allowed to approve an other method than described in the MP, even if he thinks the used method is better. The verifier is no validator (unless determined otherwise in national legislation). The MP is de basis for verification.

Source not mentioned in MP

- Several actions are necessary to correct this omission
 - MP has to be adjusted
 - Adjustment has to be approved by Competent Authority
 - Emission of the missing source has to be monitored/reported in Emission report in conformity with MP_
- If this cannot be realized in time (before 1 April),
 - The verifier can only give a positive verification statement if there is sufficient evidence that this omission will not have material consequences. In this case a remark in de verification report will be required
 - If there is not enough evidence: a positive verification statement cannot be issued.

MP is not clear

- This is a difficult issue, which we often have seen in the beginning period of ETS, when all was new.
- Several options are possible
 - Two different methods are described in the validated MP for the same emission source. In this case both methods can in principal be used. In the management report it is however recommended to remove the method from the MP that is not used.
 - The MP mentions an emission source but does not give a method at all or only partly for calculating the emission . In this case the MP is in fact an insufficient base for verification. If a positive statement can be given depends on 1) the substantiality of the emission for which the method is not clear and 2) the degree of lack of clarity. At least a remark on this point in the verification report is necessary.

Content Verification report (1)

Basic elements:

- Name and address installation and applicable year
- Scope/principals of the verification, including reference to MP
- Respective roles & responsibilities of installation, verifier and CA
- Reference to exact version of the verified emission report (+ total emission figures)
- Basis of statement (verification procedures followed, MP and other requirements)
- Overview (main) verification activities (+ *reference to contract*)
- Whether verification included site visit (if not: justification)
- Verification conclusion in the form of positive verification statement
- Remarks (if necessary)
- Date and sign on behalf of verifier by authorized signature

Content Verification report (2)

Other issues mentioned in EA 6/-03, as:

- Name of lead auditor and reviewer
- List of fuels, process material
- Total GHG emission data per activity
- List recommendations for improvement

Conclusion verification

- Emission report verified as satisfactory
 - Verification report with Positive opinion, for example:
 - “In our opinion the CO₂ emissions in the emission report version **X** d.d **Y** of installation **Z** have been correctly reported, in conformity with the requested materiality and in accordance with the agreements for measurement and accuracy as laid down in the MP **Q** that has been validated by the Competent Authority”.
- Emission report verified as not satisfactory
 - Negative Verification report
 - No verification report (only management report)
(can be the case!)

Example verification report

- Dutch Example
- [Verklaring verificatie Emissieverslag.doc](#)

Content management report

- Background
- Purpose
- Description of verification activities (including the source streams that have been verified and the % of the total CO₂-emission)
- Findings and recommendations
 - Related to MP for being up to date and a solid base for verification
 - Related to the implementation of the MP and the functioning of the monitoring system

Example management report

- See Dutch example
- [management rapport.doc](#)

VII. Competence of verifiers and other requirements

Requirements of verifier according to EA 6/03

The verifier shall establish, document, implement and maintain a competence process that demonstrates through records that all personnel are competent for the tasks allocated. This process includes the determination and implementation of:

- Competence criteria (technical scope and generic qualifications)
- A method for initial competence evaluation
- A method to ensure continued competence and regular evaluation of personnel
- A competence needs analysis and contract review process
- Regular evaluation of the overall competence process
- A system of recording

Qualifications verifier personnel

- No formal educational requirements
- Technical expertise or accountancy background
- Preferably auditing experience (ISO 14001, 9001, Management Systems)
- General knowledge of industrial sector
- For special sectors good knowledge required

Required technical competences according to EA 6/03

At least knowledge of:

1. Operator's monitoring plan, procedures, data flow and control systems including the overall organization with respect to monitoring and reporting as well as the environment in which the installation operates;
2. The installation's typical activities, equipment and relevant processes, emission sources and source streams;
3. Production inputs and outputs where relevant for GHG emissions;
4. Information for each type of GHG emission (i.e. combustion, process)
5. The origin and application of emission factors or oxidation / conversion factors, where relevant, and any other parameter or method used to calculate or measure the emissions;
6. Techniques relevant to monitoring, measurement (including device calibration and verification), calculation, analysis and reporting of the GHG emissions
7. Where applicable the techniques for chemical analysis, sampling and sample preparation especially for measuring net calorific value, elemental analyses and the determination of the biomass fraction of fuels and wastes

Special scopes for certain sectors

1. Combustion / Energy industries (renewable and non-renewable sources)
2. Mineral oil refineries
3. Coke ovens, Metal ore and sintering installations, Production of pig iron and steel
4. Production of cement clinker, lime, glass and ceramics
5. Pulp and paper producing installations
6. Small combustion installations
7. Continuous monitoring of CO₂
8. Aviation – annual emissions and tonne kilometres
9. N₂O emissions

Generic competence

- EU ETS directive and MRG
- National legislation on emission trading
- Data and information auditing
- Performing a verification engagement
- Communication skills

Competence evaluation

EA 6/03

- Verifier shall determine a method to evaluate and demonstrate their competence
- Experience and training do not demonstrate an individual is competent, but provide the appropriate routes to acquire competence. A formal qualification (when obtained by passing an examination) can be demonstration of knowledge. This may demonstrate compliance with a part of the competence criteria.

Internal requirements and organization Verifier

- Internal control procedures
- Work instructions
- Document control system
- Management of competence evaluation
- Management of impartiality and independence
 - Relationships based on common ownership, governance, management of personnel, shared resources, finances, contracts or marketing are deemed to threaten the impartiality.
 - No consulting services and technical assistance on EU ETS or other consulting services where the financial dependency could compromise the impartiality of the verification activity.
 - The verifier shall manage and monitor (potential) conflicts of interest situations and risks to impartiality.

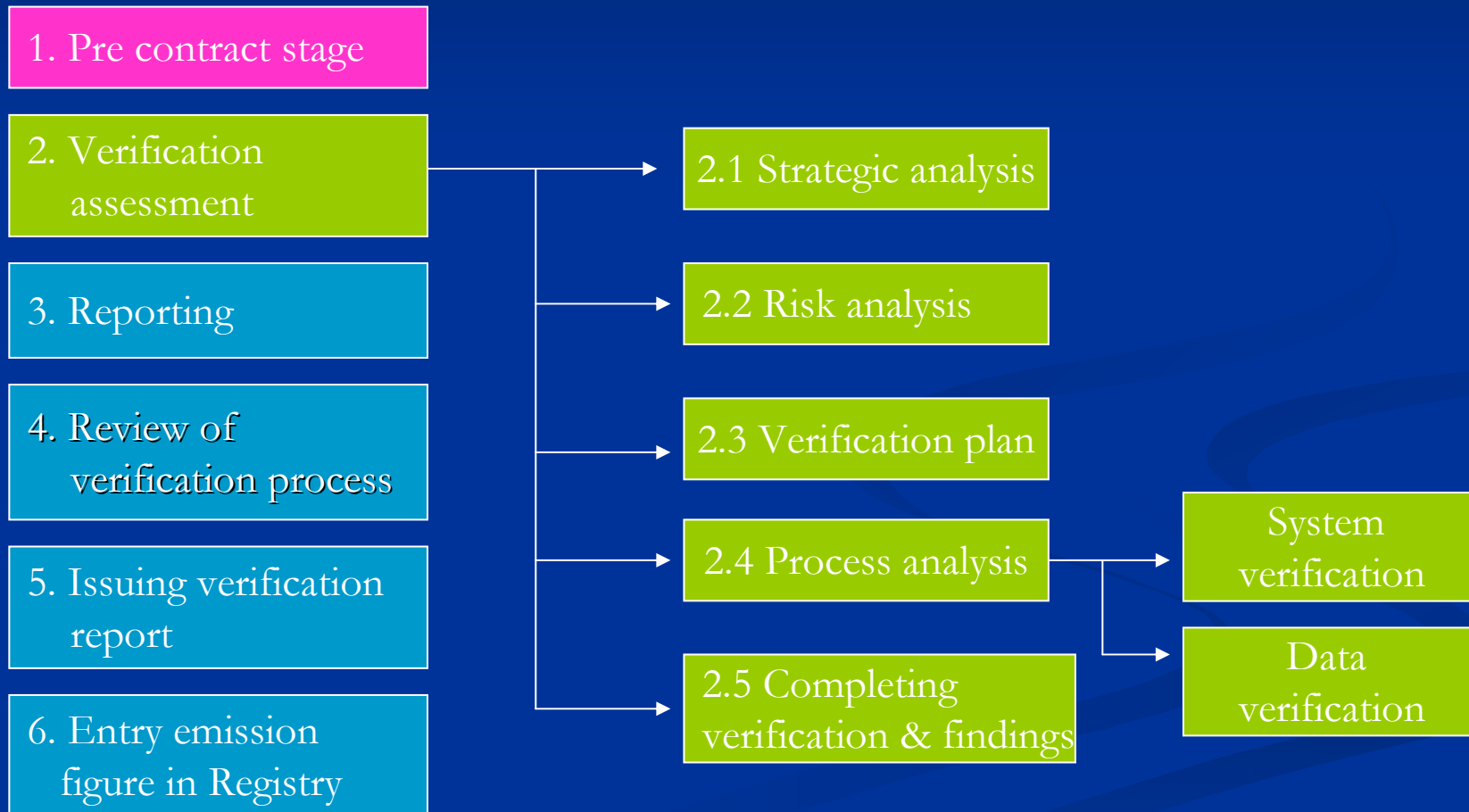
VIII. Internal quality management verifier

Quality management verifier

- Trainings programme/ Periodical Training
- Review all verifications
- Witnessing programme
- Periodical interchange of information, experiences, views
- FAQ list for uniform interpretations (CA)
- Yearly evaluation working processes and experiences to look for improvements
- Standard formats for Risk analyses/audit plan/site visit reports/verification reports etc
- Changing verifier per installation after certain period
- Central coordinating person quality issues

IX. Planning & Communication

Steps in verification proces



Planning verification(s)

The main steps of the Verification process:

- Pre contract activities
- Verification assessment
 - Strategic and risk analyses
 - System verification
 - Data verification
- Reporting, review and issuing verification report and entry data in Emission Register

Verification activities in time

Time table	Activities Installation	Activities verifier
Year x Quarter 1	-Making emissionreport year x-1 -Monitoring year x	Verifying report year x-1
Year x Quarter 2	- Monitoring year x	-Pre contract stage year x* -No substant. verification act.
Year x Quarter 3	- Monitoring year x	-Start strat./risk analysis yr x -Start system verification
Year x Quarter 4	- Monitoring year x	-Strategic/risk analysis yr x -(separate)System verification
Year X+1 Quarter 1 (ending 31 March)	-Making emission report year x -Monitoring year x+1	-Data verification year x -Combined syst/data verificat. - Reporting etc.

*For new and one year contracts

Planning verifications year x

- Make Inventory (per individual verifier/in total)
 - How many verifications
 - How many days per verification/per verifier and in total
 - How many separate system verification and how many combined
 - How many days to spent in year x (Q 2,3 and 4) and in Year x+1 (Q1)
- Keep in mind
 - Corrective actions by installation might be necessary
 - Additional verification activities might be necessary
 - Reporting/ internal documentation takes time
 - Reviewing takes time
- This means
 - Preferable to plan verification activities before half of march year x+1
 - Plan enough review capacity in March
- Also recommended
 - Plan time for executing verification, including preparation/reporting (the day before and after)

Planning: time needed for verification

- No general man-day table for ETS verifications in EU.
- In Annex E of EA-6/03 are give some criteria, but no absolute figures
- On average for (very) simple –complex installations: 1-10 days
For very complex installation with many source streams:
> 10 days
- The set up of a man-day table is an issue in Europe (more uniform approach) but difficult to set general applicable figures. (criteria: sectors, number source streams, amount emission?)
- Minimum man day criteria can give (some) guarantees that the necessary time is spent , but do not guarantee the quality.

Communication verification year x

Time	Verifier → installation	Installation → verifier
Year x, Q2	<ul style="list-style-type: none"> -Ask information for proposal* -Make/Send propopsal* 	<ul style="list-style-type: none"> -Give/send information -Give order
Year x, Q3	<ul style="list-style-type: none"> -Ask info for SA/RA (checklist*) -Plan SV (if applicable) in Q3/Q4 -Confirm date/needed info SV* -Execute SV (if applicable) in Q3/4 	<ul style="list-style-type: none"> - Give (send) information
Year x, Q4	<ul style="list-style-type: none"> -Send report* with results SV -Plan (data)verification with operator -Confirm date, needed info (what/ when) and auditees data verification 	<ul style="list-style-type: none"> - Report follow up of recommendation in SV-letter
Year x+1, Q1	<ul style="list-style-type: none"> -Send in advance: auditplan* +Rep letter* -Execute (data) verification -Confirm possible outstanding issues -Send verification-*/management report* 	<ul style="list-style-type: none"> -Send in advance ER/other info -Give/Send al needed additional info during/after data verification -Return signed Rep letter

*Standard template

Representation letter installation

- Written confirmation from management to the verifier about the fairness of data/information for the emission report .
- The purpose of the letter is to emphasize that the content of the emission report (and underlying data) are management's representations, and thus management has the primary responsibility for their accuracy.
- It is used to let the management of the installation declare in writing that the emission report and other presentations to the verifier are sufficient and appropriate and without omission of material facts to the reported figures, to the best of the management's knowledge.
- The letter is required at the completion of the audit fieldwork and prior to issuance of the verification statements with the auditor's opinion

Content of Rep letter

Responsible Management should declare that:

- All relevant information has been given
- The emission report does not contain inaccuracies or omissions of (possible) material interest
- The information in the emission report gives a broad and balanced view of the relevant matters
- The operator complies with the relevant legal and other requirements. Where violation has occurred, that could lead to material omission, this will be explained in the emission report.
- The operator has no knowledge of activities or facts that could be classified as fraud
- After the period of reporting no events took place that would make changes in the emission report necessary.

Preparation effective site visit

Make clear in advance

- What information should be sent in advance: Emission report, MP (if changed), correspondence with CA, results of internal auditing, calculation spreadsheets etc. (so verifier can prepare)
- What is expected during the site visit (so operator can prepare)
 - Whom to speak
 - What installations/meters to check
 - What information/documentation should be available during site visit (analyses, certificates, kalibration reports, invoices, results of measurements, documentation, information activity data, acces to the relevant information/computer systems)

Executing audit plan/interviews on site

- Start with clear introduction of the total programme (best before the total group of auditees)
- Explain to all auditees the reason for the visit and make clear what information you need
- Follow the verification plan
- Close interviews/audit with clear summary of findings and points that need further attention
- Close end meeting verification with clear understanding concerning the follow up and planning
- Confirm outstanding issues data verification a.s.a.p. by mail with date when to be finished

X. Practical issues system verification

System Verification

- (Pre) investigation aimed at the actual implementation of the system of measuring and datahandling in conformity with MP and internal control and quality assurance
- Can be done separately from data verification or as a combined system/data verification

Aspects System verification

1. Management systems
2. Internal Audits
3. Document control
4. Registers
5. Outsourcing
6. Tasks, responsibilities
7. Competences
8. Means
9. Inspection, maintenance
10. Calibrations
11. Computer systems
12. Others

System Verification

- | | |
|-----------------------------|----------------------------|
| 1. Management systems | 7. Competencies |
| 2. Internal Audits | 8. Means |
| 3. Document control | 9. Inspection, Maintenance |
| 4. Registers | 10. Calibrations |
| 5. Outsourcing | 11. Computer systems |
| 6. Tasks , Responsibilities | 12. Others |

Emissions from activities



Coverage 40-80% of total emissions depending on risk assesment

Parameters which need validation

Parameters

- Fuel flow
- Net caloric value
- Activity data
- Emission factor
- Oxidation factor
- Load calculation



Aspects which require special attention based on findings of risk assesment and outcome of system verification

Aspects

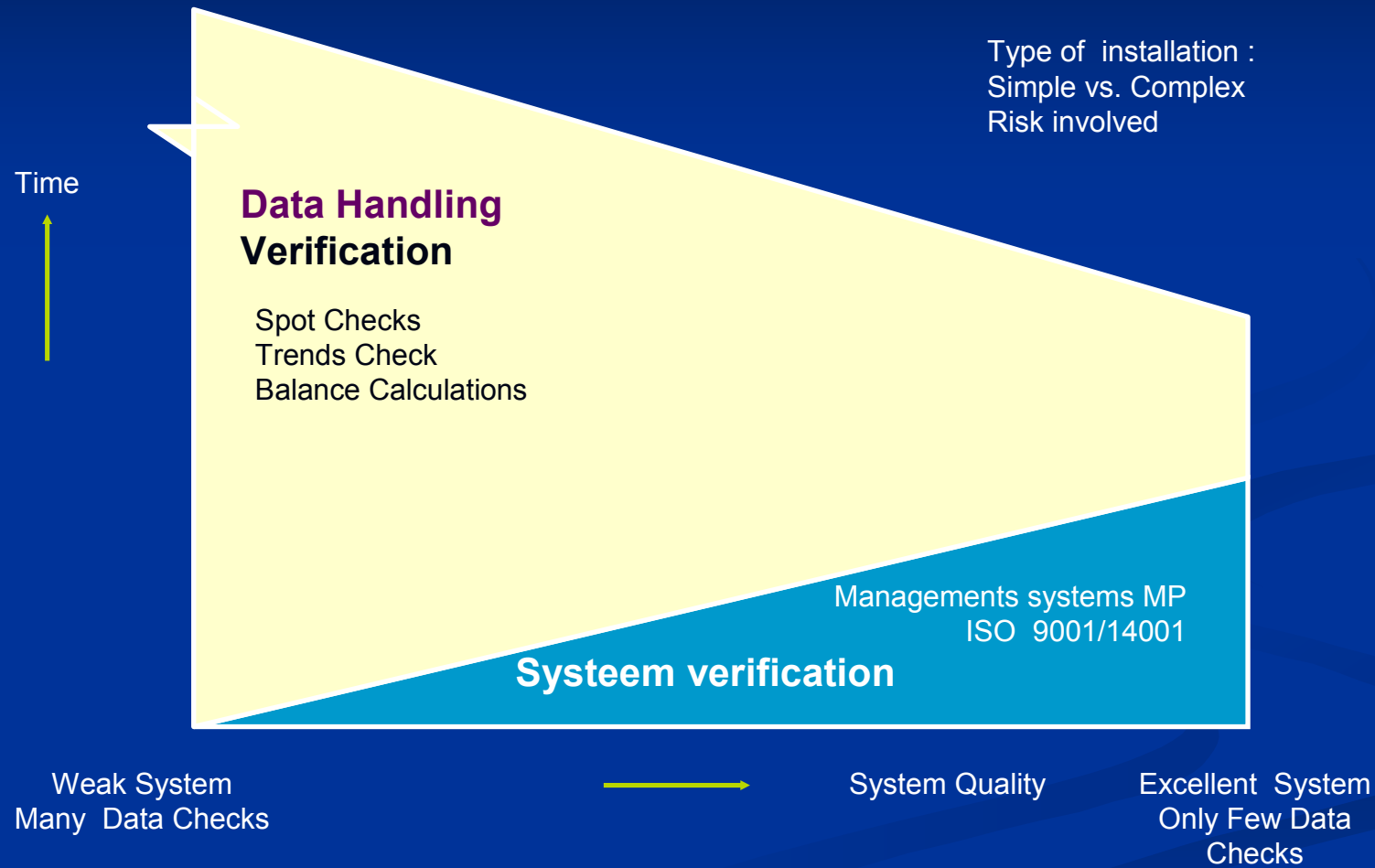
- | | |
|-------------------------|------------|
| Availability of records | 4, 11, 12 |
| Random check on records | 4, 11, 12 |
| Calculations | 3, 11 |
| Data handling | 11 |
| Data storage | 8, 9, 10 |
| Maintenance | 8, 9, 5 |
| Faulty meter readings | 4, 9, 12 |
| Corrections | 4, 12 |
| Calibrations | 10 |
| Internal Control | 1, 3, 4, 6 |
| Management systems | 1, 3, 6 |

Verdict

- OK, Correct
- Observation
- Remark
- Shortcoming

Data Handling Verification

Overall time requirements depending on outcome risk analysis



Amount of testing

1. Percentage of installations/sources (guideline)

	Coverage reasonable level of assurance
High level of internal control /quality of systems	Minimum 40-80%
Poor internal control/ quality of systems	Preferably: all minimum 80%

Work Instruction System verificatie

Quality assurance & Organisation

- Overlap with ISO/EMAS
- Internal Audits
- Document control
- Control of Registrations
- Outsourcing of activities
- Tasks, Authorisations, Responsibilities
- Competences

Validation Equipment

- Means
- Inspection & Maintenance
- Calibration & Kentalbepaling
- Computersystems

System verification in practice

- Many of you have already either been involved in the development or have carried out validation of the MP's
- Based on the MP's which are familiar to you, could you prepare a list of those elements that in your opinion require special attention during the system verification?
- Prepare a list of the top 5 items which should be in the verification plan

Serious omissions found during system verification -1-

- Registration of deviations from approved MP is not up to date
- Process for handling manual corrections of data is not properly documented
- System for whole chain of data handling is not clear or adequately controlled
- Calibrations have not been carried out, records of calibrations insufficient up to date or new results have not been correctly applied in the formula(s) of the data handling system
- Recent changes in operating procedures are not documented in the MP

Serious omissions found during system verification -2-

- Major changes in the operating procedures have not been reported to CA and therefore no approval
- The way in which emission data are being calculated and reported are in a general sense OK however no auditable evidence is available
- Responsibilities for registration, calculation, correction and reporting of deviations are not properly described and/or not operational

XI. Tools and techniques for data verification

- Amount of testing
- Analysing data spreadsheets
- Rainbow-tool

Amount of testing

1. Percentage of installations/sources (guideline)

	Coverage reasonable level of assurance
High level of internal control /quality of systems	Minimum 40-80%
Poor internal control/ quality of systems	Preferably: all minimum 80%

Amount of testing

2. Number of controles per installation/source (guidance)

Frequency	Estimated population	Numbers to be tested*
Yearly	1	1
Quarterly	4	2
Monthly	12	2-5
Weekly	52	5,10,15
Daily	250	20,30,40
More times per day	>250	25,30,45,60

* Number dependent on level of internal control

Amount of testing

3. In case of great number of registrations (guidance)

- Starting with 20 samplings/datachecks
- No errors/faults: OK
- In case of error(s): analyse error(s)
(incidental/structural error)
- In case of incidental error: take another 10 samplings
- No errors: OK
- More error(s) found: take another 10 samplings
- Again error(s) found: **system does not work**

Analysing data spreadsheets - Data

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Maand rapportage	NOx emissie											
2	juni-05			m ³ /h	m ³ /h	m ³ /h	m ³ /h	m ³ /h	m ³ /h				
3		Turbine			Verbruik			Verbr	Verbr	Waterinj	NOx uitstoot	Uitstoot	
4	Datum	uur	aan	G-a	G-b	G-c	Bijstook	turbine	WKC	[kg/kg]	(g/GJ)	GJ/u	NOx (kg/h)
712	30-06-2005 19:00	19	1	1920	329	59	270	1.591	1.861	0,55	81	65,5	5,3
713	30-06-2005 20:00	20	1	1940	320	57	263	1.620	1.883	0,55	82	66,2	5,4
714	30-06-2005 21:00	21	1	1980	355	58	297	1.625	1.922	0,55	81	67,6	5,5
715	30-06-2005 22:00	22	1	1980	355	57	298	1.625	1.923	0,55	81	67,6	5,5
716	30-06-2005 23:00	23	1	1980	338	57	281	1.642	1.923	0,55	81	67,6	5,5
717	01-07-2005	0	1	1960	320	57	263	1.640	1.903	0,55	82	66,9	5,5
718													
719	aantal	713	713	713	713	713	713	713	713	713	713	713	713
720	minimum	0	0	260	0	0	0	-29	238	0,55	0	8,4	0
721	maximum	23	1	2.380	1.507	68	1.447	1.964	2.324	0,55	121	81,7	6,2
722	gemiddelde	11	0,86	1.797	318	37	281	1.480	1.761	0,55	68	61,9	4,2

Application of (simple) statical formulas:

Total numbers, minimum, maximum, average

Analysing data spreadsheets - Data

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Maand rapportage	NOx emissie											
2	juni-05			m ³ /h	m ³ /h	m ³ /h	m ³ /h	m ³ /h	m ³ /h				
3		Turbine			Verbruik			Verbr	Verbr	Waterinj	NOx uitstoot	Uitstoot	
4	Datum	uur	aan	G-a	G-b	G-c	Bijstook	turbine	WKC	[kg/kg]	(g/GJ)	GJ/u	NOx (kg/h)
331	14-06-2005 14:00	14	1	2.140	372	59	313	1.768	2.081	0,55	80	73,2	5,9
332	14-06-2005 15:00	15	1	2.120	338	59	279	1.782	2.061	0,55	81	72,5	5,9
333	14-06-2005 16:00	16	1	2.060	303	48	255	1.757	2.012	0,55	82	70,8	5,8
334	15-06-2005 1:00	1	1	2.200	355	59	296	1.845	2.141	0,55	81	75,3	6,1
335	15-06-2005 2:00	2	1	2.220	329	60	269	1.891	2.160	0,55	81	76,0	6,2
336	15-06-2005 3:00	3	1	2.160	294	61	233	1.866	2.099	0,55	82	73,8	6,1
718													
719	aantal	713	713	713	713	713	713	713	713	713	713	713	713
720	minimum	0	0	260	0	0	0	-29	238	0,55	0	8,4	0
721	maximum	23	1	2.380	1.507	68	1.447	1.964	2.324	0,55	121	81,7	6,2
722	gemiddelde	11	0,86	1.797	318	37	281	1.480	1.761	0,55	68	61,9	4,2

- Expected number of hour values in juni: $(30 \cdot 24 =) 720$; not 713
- Between 14-06-2005 16:00 en 15-06-2005 1:00 7 values are missing

Analysing data spreadsheets - Data

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Maand rapportage	NOx emissie											
2	juni-05			m ³ /h	m ³ /h	m ³ /h	m ³ /h	m ³ /h	m ³ /h				
3		Turbine			Verbruik			Verbr	Verbr	Waterinj	NOx uitstoot	Uitstoot	
4	Datum	uur	aan	G-a	G-b	G-c	Bijstook	turbine	WKC	[kg/kg]	(g/GJ)	GJ/u	NOx (kg/h)
331	14-06-2005 14:00	14	1	2.140	372	59	313	1.768	2.081	0,55	80	73,2	5,9
332	14-06-2005 15:00	15	1	2.120	338	59	279	1.782	2.061	0,55	81	72,5	5,9
333	14-06-2005 16:00	16	1	2.060	303	48	255	1.757	2.012	0,55	82	70,8	5,8
334	15-06-2005 1:00	1	1	2.200	355	59	296	1.845	2.141	0,55	81	75,3	6,1
335	15-06-2005 2:00	2	1	2.220	329	60	269	1.891	2.160	0,55	81	76,0	6,2
336	15-06-2005 3:00	3	1	2.160	294	61	233	1.866	2.099	0,55	82	73,8	6,1
718													
719	aantal	713	713	713	713	713	713	713	713	713	713	713	713
720	minimum	0	0	260	0	0	0	-29	238	0,55	0	8,4	0
721	maximum	23	1	2.380	1.507	68	1.447	1.964	2.324	0,55	121	81,7	6,2
722	gemiddelde	11	0,86	1.797	318	37	281	1.480	1.761	0,55	68	61,9	4,2

- Waterinjection ratio: min., max. and average are identical
- Is this a measured value or a default value?
- minimum gasconsumption: negative value

Analysing data spreadsheets - Formulas

$$NO_x = e^{(a+b \cdot WI+c \cdot BS)}$$

WI = Waterinjectie ratio [-];
BS = Bijstook hoeveelheid [m_o³/h]

a=	5.420770
b=	-1.251549
c=	-2.585592e-4

AANTAL		=ALS(C5=1;EXP(\$P\$6+\$P\$8*J5+\$P\$9*G5);\$P\$13)											
	A	B	C	G	H	I	J	K	L	M	N	O	P
1	Maand rapportage	NOx emissie											
2	december-05												
3		Turbin			Verbruik	Verbr	Verbr	Waterinj	NOx uitstoot	Uitstoot			
4	Datum	uur	aan	Bijstook	turbine	WKC	[kg/kg]	(g/GJ)	GJ/u	NOx (kg/h)			
5	01-12-2005 1:00	1	0	1.369	-10	1.359	0,60	\$8*J5+\$	47,8	3,1			Formule GT-a
6	01-12-2005 2:00	2	0	1.438	0	1.438	0,60	65	50,6	3,3	a		5,420770
7	01-12-2005 3:00	3	0	1.440	-20	1.420	0,60	65	49,9	3,2	BS	%	-
8	01-12-2005 4:00	4	0	1.430	-10	1.420	0,60	65	49,9	3,2	b		1,251549
9	01-12-2005 5:00	5	0	1.450	-10	1.440	0,60	65	50,6	3,3	c		0,0002585592
10	01-12-2005 6:00	6	0	1.460	0	1.460	0,60	65	51,3	3,3	WI ratio	kg/kg	0,600
11	01-12-2005 7:00	7	0	1.480	-20	1.460	0,60	65	51,3	3,3			
12	01-12-2005 8:00	8	0	1.460	-20	1.440	0,60	65	50,6	3,3	Uitstoot koudlucht bedrijf		
13	01-12-2005 9:00	9	0	1.480	0	1.480	0,60	65	52,1	3,4		g/GJ	64,8
14	01-12-2005 10:00	10	0	1.410	-10	1.400	0,60	65	38,7	2,5			

Analysing data spreadsheets - Formulas

AANTAL		X ✓ =		=(15*35,17)/1000											
	A	B	C	G	H	I	J	K	L	M	N	O	P		
1	Maand rapportage	NOx emissie													
2	december-05			m³/h	m³/h	m³/h									
3		Turbine		Verbruik	Verbr	Verbr	Waterin	NOx uitstoot	Uitstoot						
4	Datum	uur	aan	Bijstook	turbine	WKC	[kg/kg]	(g/GJ)	GJ/u	NOx (kg/h)					
5	01-12-2005 1:00	1	0	1.369	-10	1.359	0,60	64,8	5,17	3,1			Formule GT-a		
6	01-12-2005 2:00	2	0	1.438	0	1.438	0,60	65	50,6	3,3	a		5,420770		
7	01-12-2005 3:00	3	0	1.440	-20	1.420	0,60	65	49,9	3,2	BS	%	-		
8	01-12-2005 4:00	4	0	1.430	-10	1.420	0,60	65	49,9	3,2	b		1,251549-		
9	01-12-2005 5:00	5	0	1.450	-10	1.440	0,60	65	50,6	3,3	c		0,0002585592-		
10	01-12-2005 6:00	6	0	1.460	0	1.460	0,60	65	51,3	3,3	VM ratio	kg/kg	0,600		
11	01-12-2005 7:00	7	0	1.480	-20	1.460	0,60	65	51,3	3,3					
12	01-12-2005 8:00	8	0	1.460	-20	1.440	0,60	65	50,6	3,3	Uitstoot koudlucht bedrijf				
13	01-12-2005 9:00	9	0	1.480	0	1.480	0,60	65	52,1	3,4		g/GJ	64,8		
14	01-12-2005 10:00	10	0	1.110	10	1.100	0,60	65	38,7	2,5					

- Calculating method is correct
- Number 35,17 (higher heating value) should be 31,65 (lower heating value)

Programme for analysing data files

- **What if data spreadsheets exists of hundreds of rows/ formulas?**
- **Solution: programmes for analysing work sheets (as add-in)**
- **For example Rainbow Analyst Professional. Makes it possible to**
 - **Give the same color to groups with the same formula**
 - **Analyses the relation between cells**
 - **Etc.**

Rainbow example

- Example
- Voorbeeld voor Rainbow.xls

Analysing data files: groups of formulas (1)

	A	B	C	D	E	F	G
1	Gasverbruik eigen metingen						
2		Voor correctie	Na correctie	GJ	kental	NOx	CO2
3	M1	3.051.566	3.034.702	96.048	20	1,9	5.361
4	M2	2.955.388	2.939.056	93.021	20	1,9	5.192
5	M3	2.379.291	2.366.142	74.888	21	1,6	4.180
6	M4	1.879.769	1.869.381	59.166	80	4,7	3.303
7	M5	-	-	-	0	-	-
8	M6	3.018.761	3.002.079	95.016	61	5,8	5.304
9	Som	13.284.775	13.211.360	418.140		16	23.340
10	Gasverbruik rekening	13.211.360					
11	Vershil	-0,55%					
12							

- Same color formula groups: same formulas
- Checking one row is sufficient

Analysing data files: groups of formulas(2)

	A	B	C	D	E	F	G
1	Gasverbruik eigen metingen						
2		Voor correctie	Na correctie	GJ	kental	NOx	CO2
3	M1	3.051.566	3.034.702	96.048	20	1,9	5.361
4	M2	2.955.388	2.939.056	93.021	20	1,9	5.192
5	M3	2.379.291	2.366.142	74.888	21	1,8	4.180
6	M4	1.879.769	1.869.381	59.166	80	4,7	1.863
7	M5	-	-	-	0	-	-
8	M6	3.018.761	3.002.079	95.016	61	5,8	5.304
9	Som	13.284.775	13.211.360	343.251		16	21.901
10	Gasverbruik rekening	13.211.360					
11	Verschil	-0,55%					

- Cells with different color within a formula group: different formula
- Further analyse deviation (possible mistakes)

Analysing data files : relation between cells

	A	B	C	D	E	F	G
1	Gasverbruik eigen metingen						
2		Voor correctie	Na correctie	GJ	kental	NOx	CO2
3	M1	3.051.566	3.034.702	96.048	20	1,9	5.361
4	M2	2.955.388	2.939.056	93.021	20	1,9	5.192
5	M3	2.379.291	2.366.142	74.888	21	1,8	4.180
6	M4	1.879.769	1.869.381	59.166	80	4,7	1.863
7	M5	-	-	-	0	-	-
8	M6	3.018.761	3.002.079	95.016	61	5,8	5.304
9	Som	13.284.775	13.211.360	343.251		16	21.901
10	Gasverbruik rekening	13.211.360					
11	Verschil	-0,55%					

labels

These data are not used in any calculation

E5?

input

Input data for further calculation

output

End result of calculation. With these data no further calculation takes place *D5?*

formules

In between calculation (result and input of calculation)

Analysing data files : combination

	A	B	C	D	E	F	G
1	Gasverbruik eigen metingen						
2		Voor correctie	Na correctie	GJ	kental	NOx	CO2
3	M1	3.051.566	3.034.702	96.048	20	1,9	5.361
4	M2	2.955.388	2.939.056	93.021	20	1,9	5.192
5	M3	2.379.291	2.366.142	74.888	21	1,8	4.180
6	M4	1.879.769	1.869.381	59.166	80	4,7	1.863
7	M5	-	-	-	0	-	-
8	M6	3.018.761	3.002.079	95.016	61	5,8	5.304
9	Som	13.284.775	13.211.360	343.251		16	21.901
10	Gasverbruik rekening	13.211.360					
11	Vershil	-0,55%					

	A	B	C	D	E	F	G
1	Gasverbruik eigen metingen						
2		Voor correctie	Na correctie	GJ	kental	NOx	CO2
3	M1	3.051.566	3.034.702	96.048	20	1,9	5.361
4	M2	2.955.388	2.939.056	93.021	20	1,9	5.192
5	M3	2.379.291	2.366.142	74.888	21	1,8	4.180
6	M4	1.879.769	1.869.381	59.166	80	4,7	1.863
7	M5	-	-	-	0	-	-
8	M6	3.018.761	3.002.079	95.016	61	5,8	5.304
9	Som	13.284.775	13.211.360	343.251		16	21.901
10	Gasverbruik rekening	13.211.360					
11	Vershil	-0,55%					

D5 not in totalization D9

E5 not input F5

G6 used in formula, mistake in input

XII. Approach simple and complex installations

What will be different for simple and complex installations ???

- Pre contract stage
- Verification assessment
- Strategic & risk analysis
- Verification plan
- System verification
- Data verification
- Review verification process
- Issuing verification report

What determines an installation to be considered simple or complex ?

■?

■?

■?

■?

Example simple installation

Installatie	brandstof	CO2 ton	Meet systeem	NOx kg
WKK	Aardgas	30000	PEMS	16300
Wervelbed	Aardgas + Afvalstoffen	11000	Kental	14500
Stoomketel K3	Aardgas	3000	Kental	1580
Stoomketel K4	Biogas	4000	Kental	6250
Totaal		44000		38630
Materialiteits grens 5%		2200		1932

Example complex installation

Installatie	brandstof	CO2 ton	Meet systeem	NOx kg
WKK	Aardgas	120000	PEMS	16900
F 2300	Aardgas	60000	PEMS	11600
F 2302	Stripgas	6000	kental	8000
F 555	Steenkool	180000	CEMS	23500
F 601 A/B	Stripgas	2000	kental	300
U 2200	proces	50000	CEMS	17500
U 4550	proces	23000	CEMS	13000
U 6000	pet cokes	8600	kental	10900
STG fakkels	stripgas	690	kental	45
F 3005	Aardgas	3000	kental	6700
F 3010	Aardgas	2900	kental	3950
F 45-55	Aardgas	1400	kental	500
U 200	Aardgas	1000	kental	500
Totaal		458590		113395
Materialiteits grens 5%		22930		5670

Other obvious examples of complex installation

-

-

-

Strategic & risk analysis

■ Simple installation

-

-

-

-

■ Complex installation

-

-

-

-

Verification plan

- Simple installation

-

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- Complex installation

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System verification

- Simple installation

-

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- Complex installation

-

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-

-

Data verification

- Simple installation

-

-

-

-

- Complex installation

-

-

-

-

Issuing verification report

- Simple installation

-

-

-

-

- Complex installation

-

-

-

-

Work Instruction progress verification

Operator identification

1. Documents Control

2. Overall planning schedule

3. Risk Analysis & Verification plan

4. Site visit 1

5. Site visit 2

6. Preparation of verification report

7. Internal Review

Work Instruction Risk Analysis

Strategic & Risk Analysis

Verification plan

Work Instruction System Verification

Work Instruction Data Verification

Emission Logsheets

XIII Case studies

1. Pre contract stage

2. Verification assessment

3. Reporting

4. Review of verification process

5. Issuing verification report

6. Entry emission figure in Registry

Case studies internal control verifier

1. Internal verification documentation
2. Internal Review

Case study 1

Internal verification documentation

- Case: Make overview of the documents that need to be documented by the verifier (table of content internal documentation file)

Content internal verification file

- Example
- table of contents file internal documentation.doc

What information is part of:

- Correspondence competent authority
- Correspondence installation
- Results of system/dataverification

Relevant correspondence competent authority

- Letter with approval of MP
- Requests for changes in MP
- Reactions on requests for changes in MP
- (Mail) correspondence on special issues
 - temporary deviations
- Results of audit visits from competent authority
- Correspondence related to changes to permits

Relevant correspondence installation

- All correspondence as mentioned in table of contents (as part of the defined steps in the verification process)
- Additional E-mails concerning supply of additional information as a result of risk analyses, system- or data verification
- Additional correspondence related to changes in schedule

Results of system/data verification

- Reporting of results of findings system/data verification
- Reporting deviations from auditplan
- Underlying information/ documentation (evidence)
(calculating)spreadsheets, print out of inputdata, results of analyses, kalibration reports, reports internal audits etc etc
- Reference to underlying evidence
- Calculation checks performed by verifier

Case study 2: Review

Case study review

- Main purpose second pair of eyes which serves four different functions
 1. Review function
 2. Final check on reasonable assurance criteria
 3. To ensure verification in accordance with relevant requirements (EU-ETS, NAP)
 4. Proof reading function

Case study review

- Basis for review: all internal verification documentation
- Formal check list preferably to be used
- Dutch examples of such work instruction
- Outcome of review again to be included in the internal verification report

Work Instruction Internal Review

Stap 7: Review			
Uitvoering : hoofd verificatie			
	In orde?		datum en paraaf
Volledige en goedgekeurde documenten zijn aangetroffen in het dossier.	<input type="checkbox"/> ja	<input type="checkbox"/> nee	
Risico Analyse (WI 410) uitgevoerd en in dossier.	<input type="checkbox"/> ja	<input type="checkbox"/> nee	
Verificatie programma met voldoende breedte is aangetroffen in dossier.	<input type="checkbox"/> ja	<input type="checkbox"/> nee	
Bij Systeemcontrole zijn alle elementen geverifieerd. De ingevulde WI 420 zit in het dossier. Negatieve bevindingen zijn helder en duidelijk geformuleerd.	<input type="checkbox"/> ja	<input type="checkbox"/> nee	
De reviewer geeft een eigen oordeel over de kwaliteit van het systeem. Er zijn drie mogelijkheden, met gerelateerde niveaus van gegevensonderzoek.			
Systeemkwaliteit	Norm	Keuze	Norm gegevenscontrole

WI 400

Stap 7: Review

Oordeel inzake CO2 en NOx emissie separaat opgeven	In orde?	datum en paraaf
De gegevenscontrole is per bron voldoende gedocumenteerd en aanwezig in het dossier middels ingevulde WI 430.	<input type="checkbox"/> ja <input type="checkbox"/> nee	
Is er voldoende dekking geweest bij gegevenscontrole?	<input type="checkbox"/> ja <input type="checkbox"/> nee	
Is de voorgestelde verklaring in orde?	<input type="checkbox"/> ja <input type="checkbox"/> nee	
Is de voorgestelde management letter in orde?	<input type="checkbox"/> ja <input type="checkbox"/> nee	
Opmerkingen m.b.t. aangebrachte verbeteringen:		

Case study review

- Case: Make an overview of the items and elements that need to be dealt with during the internal review
- Design a Work Instruction for Internal Review

Example of items to be part of the Work Instruction Review System Verification

Execution of verification	Yes/No	Date /Signature from Reviewer
Complete and approved documents are in the file		
Risk analysis has been carried out and WI is in the file		
Verification plan of sufficient depths and breadth is in file		
During system verification all elements have been covered		
Completed WI SV is in file		
Negative finding are clearly and properly formulated		

Reviewer gives his own judgement on the quality of the verified System.

Three possibilities : System is Good / Boarderline / Bad.

Example of items to be part of the Work Instruction Review System Verification

Execution of verification	Yes/No	Date /Signature from Reviewer
Data control per emission source is well documented and relevant WI is in File		
Data control has covered sufficient part of total emissions based on risk assesment.		
Text proposal for Verification Statement is OK		
Text proposal Management letter is OK.		
Remarks and suggestions for improvement.		

Course evaluation / discussion

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