AV Training Handbook

-covering three main and complex verification issues-

This handbook is intended for use in the training of verifiers involved in the verification of GHG annual emissions reports under the EU ETS, for (lead) assessors of accreditation bodies responsible for oversight and witnessing of verifiers as well as for practitioners of competent authorities responsible for the review of GHG emissions reports and verification reports.

This handbook has been composed on the basis of three scenarios and their model answers developed for the 2016 Accreditation and Verification Training Event that took place on the 14th and 15th September 2016 in Brussels, Centre Albert Borschette. It includes an introduction (overview) of the event, the outline and content of the three scenarios, the model answers on the questions of the three scenarios, as well as the feedback received from the trainers at the event and the conclusions, as well as the programme of the 2-day training event and presentations outlining each of the scenarios at the start of each session.
I. OVERVIEW

This handbook is intended as guidance for the training of verifiers, (lead) assessors of accreditation bodies as well as for practitioners from Competent Authorities in the area of the Verification and Accreditation in EU ETS (European Union Emission Trading System). It was prepared for the Accreditation & Verification (A&V) Training Event organised by the EU ETS Compliance Forum secretariat on behalf of the European Commission. It was attended by 35 verifiers, 13 participants from national NABs and 28 staff from CAs.

The motivation for this handbook and the 2016 Accreditation & Verification (A&V) Training Event was to discuss some of the more complex issues associated with EU ETS verification. The training aimed at providing an up to date shared understanding of the following main topics:

- Verifier's sampling and scope of verification; materiality and reasonable assurance judgements;
- Resolutions in connection with Article 23 MRR (notification of temporary changes to the MP) and Article 65 MRR (data gaps);
- Changes in the capacity, activity levels and operation of an installation (Article 17(4) and 27(3) (o) AVR).

The verification issues at the training were explored and explained on the basis of three case studies (scenarios) and a set of questions related to each scenario. The training started with issues concerning a relatively simple power plant as the base case. In Scenario 2 this power plants became part of a larger complex, which included a large refinery. In Scenario 3 the boundary of the industrial site were enlarged further to include two chemical plants, with all three plants under the same holding company.

The three scenarios and related questions have been developed to cover a range of interrelated verification issues. However, each scenario and the questions listed under its content description is to be considered on their own, implying that information provided for Scenario 2 is not relevant for answering the questions under Scenario 1, and in the same way, additional and new information provided for Scenario 3 is not relevant and should not to be used to answer questions of Scenario 2.

The training was arranged to allow extensive exchange of views and discussions between the participants on the subjects covered by the training. Each participant was assigned to one of nine Discussion Groups (DG) with an experienced verifier as trainer. Each DG consisted of a balanced mix of representatives of CAs, verifiers and NABs from different MS so as to maximise the training, exchange of experience and learning from the event. On average each discussion group was made up of 3-5 verifiers (including the trainers), 3-4 practitioners from the CAs and 1-2 representatives from NABs.

The DGs were invited to address the verification questions and issues listed for each scenario. Each session of the training started with a short introduction to the scenario and the questions pertaining to that scenario which the participants/DGs were asked to resolve.

Before the training the scenario documentation had been made available to each participant. All participants had been advised to study each scenario very carefully and consider in detail the questions formulated for each of the three scenarios and come well prepared to the training to address and resolve the questions formulated for each of the three scenarios. They were advised to acquaint themselves with the requirements in the MRR and AVR and study the relevant guidance documents. Participants were instructed to ask themselves “does the verifier have the information needed to answer the question, should the verifier ask the operator for additional information, or should the verifier do additional tests to ensure that it is able to address the issue.” However, the information provided for each scenario should be sufficient to allow the participants to answer the questions.

The agenda of the 2-day training event (see Annex II) contained different sessions. Session I started with an introduction of the base case study (Scenario 1) and the issues to be addressed related to that scenario. (scope of verification, sampling plan, materiality and reasonable assurance judgments). Session
II & III dealt with Scenario II, in particular Article 23 and Article 65 considerations. Scenario III (session IV, Day 2) related to issues of capacity changes, activity levels and changes in operation of the installations and the role of the verifier concerning Article 17(4) and 27(3) (o) AVR. In session V the Discussion Groups were invited to summarise their findings and exchange their views on the training, whereupon in session VI the main conclusions from the training were formulated.

This handbook consists of the following chapters:

I. Overview

II. Outline and content of the three scenarios

III.1 Model answers for Scenario 1, i.e. instructions to trainers

III.2 Model answers for Scenario 2, i.e. instructions to trainers

III.3 Model answers for Scenario 3, i.e. instructions to trainers

IV. Findings from the nine Discussion Groups

V. Findings from the plenary Q&A

Annex I Programme of 2016 EU ETS Compliance Forum Event: Training on Accreditation and Verification

Annex II Introductory presentations to explain Objectives and Aims of the Accreditation and Verification Training

Suggestions for the use of this handbook.

To maximise the benefits of this handbook, verification bodies, NABs and CAs are advised to make the scenarios (case studies) and the questions for each scenario available to their staff. The trainers are advised to make use of the model answers (instructions to trainers) provided in chapter II.
II. Outline and content of the three scenarios

Scenario 1: Power Generation

The Installation

The installation is a heavy fuel oil (HFO) fired power station generating electricity with export of electricity to the national grid and steam for industrial use. It is regulated as a combustion installation under Annex I of the Directive and produces around 285,300 tonnes CO₂ per year.

The equipment for electricity generation comprises of two main boilers feeding into steam turbines, two smaller gas turbines which provide additional support capacity for industry or grid balancing as required, and three auxiliary boilers that produce steam to support electricity generation and maintaining elevated temperature of the HFO in the bulk fuel tank. All the boilers burn HFO and use propane as a start-up fuel. The gas turbines are fired on gas oil.

In addition to the equipment for electricity generation there is a propane-fired heating system installed in the workshop area; and three fixed fire-fighting pumps to supplement water pressure and flow in the event of an emergency. These pumps are powered by engines which burn gas oil. Very small quantities of gas oil and propane are used on site by portable (but not mobile) combustion units used during maintenance. The HFO is stored in two large bulk tanks with a smaller quantity transferred to a day tank for immediate use; two separate gas oil tanks are in the same storage compound.

The outline and boundary of the Power Plant for Scenario I are provided below

Fuel accounting:

Heavy Fuel Oil (HFO) is delivered to site by ship tanker and transferred to the bulk storage tanks; ship and bulk tank levels are measured before and after deliveries using independent tank dips and accounting for fuel density and temperature using tank tables with a reference temperature of 15°C.

Changes in bulk tank stocks are measured by automatic level & temperature gauges at the end of each month, and cross-checked by manual tank dips. Representative HFO samples are taken upon delivery into the storage tanks and at the end of each month when the tanks are independently dipped; these are sent for analysis at an external laboratory to determine composition and NCV.

Gas Oil and Propane are delivered by road and consumption is calculated based on delivery notes from the supplier. Emissions factors and NCV for Gas Oil and Propane are taken from the National Inventory default values. Consumption (Activity Data) of all fuels is based on a stock balance using the data collected from deliveries and tank level changes.

1 Standard factors used by the Member State for its national inventory submission to the Secretariat of the United Nations Framework Convention on Climate Change
1. Questions:

a) What questions should a verifier ask itself to determine the depth and scope of verification for this year? What elements are important given the information in the context?

b) What additional information should the verifier ask for to allow it to determine the depth and scope of verification sufficiently?

c) What is the category of the installation and the materiality level to be applied?

d) What role does the materiality level and materiality considerations play in determining the scope and detail of verification? How is this connected to the verifier’s risk analysis?

e) Given the context in this case, what inherent and control risks should the verifier identify and on what elements should the verifier focus its verification checks? Please indicate the reasons why the verifier should focus on these elements and indicate what questions the verifier should ask itself when identifying the risks and determining the scope.

f) What would be the scope of the test plan and the data sampling plan in the verification plan \(^2\) to test the fuel accounting data (i.e. what fuels and other issues should be included and how much of the data should the verifier test – and why?)

Additional Information 1.1:

The operator has taken a decision to test fire this year some alternative fuels to determine if these are appropriate fuels in the shorter term going forward (from both a cost effectiveness, carbon reduction and generation efficiency perspective); there are four fuels under consideration – Rape seed oil; Tall oil; Cashew nut oil; and Reclaimed oil.

Additional Questions under 1.1:

1.1a What questions should the verifier ask itself when confronted with the changes in the operation of the installation that occurred during the reporting year?

1.1b What additional implications does the operator’s claim have that these alternative fuels are bioliquids with non-reportable (i.e. zero-rated) emissions for the verification?

\(^2\) The verification plan consists of a verification programme, a test plan and a data sampling plan (Article 13 AVR)
Scenario 2: Power Generation is attached to a Refinery

In scenario 2, the Power Plant and a nearby Refinery\(^3\) are part of the same industrial complex under the same holding company.

The Installation

The Power Generation facilities described in Scenario 1 form part of an industrial complex that includes a refinery which produces around 2,409,670 tonnes CO\(_2\) per year. The Power Plant delivers steam to the Utility plant of the refinery. The refinery is located a mile inland from the coast and has an annual crude oil throughput of around 210,000 barrels per day (bbl/day). The refinery receives crude oil by ship, primarily from the North Sea, and exports refined products by ship, road tanker, wagon and pipeline across Europe and to other parts of the world.

The technical units at the refinery consist of; a 210,000 bbl/day Crude Distillation Unit (CDU), 3 Hydro-treaters (HT), Vacuum Distillation Unit (VDU), Visbreaker Unit (VBVU), Fluidised Catalytic Cracking Unit (FCCU), Unifiner Unit, Catalytic Reforming Unit (CRU), Isomerisation Unit, Hydrogen Recovery Unit, Merox Units, Utilities Plant, LPG Recovery Unit, Butamer Unit, Alkylation Unit, Amine Regeneration and Sulphur Recovery Unit, Wastewater Treatment Unit, Crude Oil and Product Storage, three flares, two jetties and a road tanker loading facility.

The fuels combusted and materials used within the refinery\(^4\) are: Heavy Fuel Oil (0.3%), Refinery Fuel Gas (51.3%), Natural Gas, Refinery Flared Gas (2.3%)\(^5\); Gas Oil (0.2%); Acid Gas (<0.0%), LPG (0.1%), FCCU Coke (45.5%) and CRU Regen Coke (0.3%).

Fuel accounting

HFO for use in the Power Plant is stored in a dedicated storage tank and accounted for as is described in Scenario 1 above. HFO used in the refinery is also taken from the dedicated storage tank. Refinery Fuel Gas (RFG) is derived from off gases collected from the various process units that are blended in Vessel 30-V-4809 and put into the gas ring main piping which also allows the intake of Natural Gas for pressure balancing\(^6\). Gas is measured into consuming units (e.g. heaters) using differential pressure meters comprising Orifice Plates with temperature and pressure compensation; continuous meter readings are transferred via the flow computer to the Plant Information (PI) system from where it can be downloaded into spreadsheets and databases for use. The RFG gas used in the VBU unit amounts to about 2.5% of the total RFG consumption of the refinery.

RFG composition is analysed twice a day from samples taken from Vessel 30-V-4809 and the results are used to generate a monthly average composition. Analysis is undertaken by the on-site lab and the results are uploaded to the Laboratory Information Management System (LIMS) and exported to the PI system. The flow of Refinery Flared gas is measured through ultrasonic meters in the pipelines to the flare stacks. The pilot gas for the flare is refinery fuel gas. Flare gas composition is assumed to be similar to refinery fuel gas during normal refinery operation. During upset conditions the composition of the flare gas is determined depending on the vessel/process that has been blown down to the flare.

Coke make\(^7\) is calculated on the basis of the CO\(_2\) concentration in the FCCU/CRU flue gas stack, which is determined by online analysers (these are installed for operational control reasons and to meet regulatory requirements but are not used specifically for continuous emission measurement of CO\(_2\) via CEMs). The concentration is multiplied by the online air flowrate and the flue gas to air ratio.

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\(^3\) Relevant information concerning refinery processes and technical details can be found via following links:

- [http://www2.emersonprocess.com/siteadmincenter/PM%20Articles/OilRefineryWalk-Through_CEP_May2014_Hi-Res.pdf](http://www2.emersonprocess.com/siteadmincenter/PM%20Articles/OilRefineryWalk-Through_CEP_May2014_Hi-Res.pdf)

\(^4\) % values indicate the proportion of aggregate emissions arising from each fuel source stream

\(^5\) Refinery had a major shut down for maintenance and depressurising the whole plant and also process upsets during start up.

\(^6\) Natural Gas is only used for pressure balancing in the RFG ring main and does not constitute a source stream on its own.

\(^7\) Coke make refers to the process whereby during the cracking of the oil in the FCCU carbon is formed on the surface of the catalyst, quickly de-activating the catalyst. The catalyst is “regenerated” in the regenerator vessel of the FCCU, whereby steam is led over the hot catalyst and the carbon is burnt off.
Outline of the industrial complex in scenario 2, i.e. the power plant and the refinery, is outlined below. The questions listed below refer to the shown situation.
2. Questions :

a) What consequences do the changes in the context of Scenario 2 have for the required competences of the verifier?

b) Given the context in this scenario, what inherent and control risks should the verifier identify and on what elements would the verifier focus its verification checks? Please indicate the reasons for focusing on these elements and indicate what questions the verifier should ask itself when identifying the risks and consequently determining the scope and detail of verification.

c) How would the verifier check on whether the industrial complex is one installation or multiple installations on one site? If the industrial complex contains two installations, can a single verification be carried out and what questions would be relevant?

d) In recognition of the more complex installation boundaries compared to Scenario 1, what additional checks are likely to be necessary in relation to the MP?

e) On the basis of the information provided, how should the verifier expect the operator to have classified its source streams in terms of major – minor – de-minimis? How should the verifier go about checking that this is correct?

f) What information would the verifier need to determine its approach to testing internal controls over the data accounting process? What sources of evidence would the verifier need? And how would the verifier decide where to focus its attention?

g) What information would the verifier need to determine its approach to data sampling for the installation described? What sources of evidence would the verifier seek?

h) Also in view of the high volume of gas flaring during the year, how would the verifier check the appropriateness of the flare gas quantity and quality determination, and how and what would the verifier need to check the quantity of the purge gas used?

Additional information 2.1

During the first stage of the verification conducted in Quarter 3 of the reporting year, the verifier has identified that the meter to the heater in the VBU had not been working properly since the shutdown in April (the plant came back on line in the first week of May). This had not been identified by the operator.

The following fuel consumption data was provided by the operator:

<table>
<thead>
<tr>
<th>Month</th>
<th>Fuel gas Consumption (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>1010</td>
</tr>
<tr>
<td>February</td>
<td>1011</td>
</tr>
<tr>
<td>March</td>
<td>1073</td>
</tr>
<tr>
<td>April</td>
<td>174</td>
</tr>
<tr>
<td>May</td>
<td>808</td>
</tr>
<tr>
<td>June</td>
<td>738</td>
</tr>
<tr>
<td>July</td>
<td>857</td>
</tr>
<tr>
<td>August</td>
<td>878</td>
</tr>
<tr>
<td>September</td>
<td>943</td>
</tr>
<tr>
<td>October</td>
<td>762</td>
</tr>
<tr>
<td>November</td>
<td>872</td>
</tr>
<tr>
<td>December</td>
<td>902</td>
</tr>
<tr>
<td><strong>Total Consumed</strong></td>
<td><strong>10028</strong></td>
</tr>
</tbody>
</table>

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8 Purge gas: all flare systems are susceptible to flashback and explosion if not properly purged to keep air (oxygen) from entering the flare stack downward through the flare burner. To prevent air from entering the system during normal operation, a continuous purge is required.
**Additional Questions 2.1**

2.1a What impact might this have on the declared emissions and the conclusion of the verifier?

2.1b What checks should the verifier carry out to identify the likely cause of this?

2.1c What action should the verifier take to establish the level of the potential error; and what further information might the verifier need to do that?

2.1d Is this a data gap? If yes, how might this be addressed by the operator and what checks should the verifier carry out to determine if this is reasonable?

**Additional information 2.2**

During the physical inspection of the process units and their instruments, the verifier also identified that the calibration gas bottle for one of the online analysers on the fuel system was outside its validity date.

**Questions 2.2**

2.2a Would this constitute a data gap?

2.2b What recommendations might the verifier make?

2.2c What impact might this have on the declared emissions and the conclusion of the verifier?
Scenario 3: The Power Plant and the Refinery are part of a larger petrochemicals complex

The Industrial Site and its Installations

The industrial site comprises the power plant, the refinery and a petrochemicals complex with two chemical production plants: Chem-X (producing High Value Chemicals – HVC via steam cracking and containing an extraction unit for the production of Butadiene - EB); and Chem-Y (production of polyethylene and poly-propylene). In this scenario the refinery is part of the same legal entity as Chem-X. The Power generation plant belongs to the same ‘mother’ holding company as the petrochemicals complex Chem-X and Chem-Y, however the power plant operates as a separate legal entity.

In March 2015 the holding company decided at its board meeting to restructure its current activities. As part of this, the refining activity of Chem-X was closed and on 1 Jan 2016 ceased all operations; the auxiliary equipment and utilities for the production of heat of Chem-X and Chem-Y (e.g. boilers, compressors, generators, water purification plant, etc.) physically located at the two chemical production plants were transferred into a new legal entity (Utility-A). All heat produced in Utility-A is transferred via pipelines to Chem-X and Chem-Y; the extraction unit (EB) for Butadiene was transferred to Chem-Y.

The steam cracking installation of Chem-X has a capacity of 450,000 tonnes (ethylene basis). Before the restructure, heat at Chem-X, heat was produced in 3 natural gas fuelled boilers B101, B102 and B103; approximately 110 MW each. Before the above mentioned reorganisation had been realised, heat production at Chem-Y was generated in 2 identical boilers each with a capacity of 85 MW each. After the reorganisation, heat can (still) be transferred between Chem-X and Chem-Y. Due to the fact that in Chem-X the refinery activities have stopped as off 1st January 2016, B103 is planned to be decommissioned/removed next year 2017.

The industrial site is located within a Member State that has required the operator to include a procedure pursuant to Article 12(3) MRR in order to meet the requirements of Article 24(1) of the CIMS. The verifier is being requested to verify the emissions concerning year 2016. Based on previous verified emission data, the EB unit contributes an emission of 195,000 tonnes CO₂ per year, and Chem-Y emitted last year 475,200 tonnes CO₂. As a result, Chem-Y becomes a category C installation whereas Chem-X remains a category C installation.

For scenario 3 and the questions listed below, please consider the following configuration of the industrial site and the various plants being part of that complex.

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9 Useful documents for the preparation of questions related to this scenario:

10 The emission data above are illustrative, and only for the purpose of this training. Other data such as operating hours in relation to boiler capacity, have been deliberately removed as this is irrelevant for the exercise at hand.
3. Questions

a) What questions should a verifier ask itself to determine the depth and scope of verification for this situation in 2016? What elements are important given the information in the context?

b) What information is missing from the context to determine the depth and scope of verification sufficiently?

c) What questions should the verifier ask itself when considering the impact of the organisational and operational changes on the permit and the monitoring plan?

d) What types of changes do you distinguish that need to be submitted to the CA by the various operators?

e) What notifications to the competent authority are required by the operator(s) and when?

f) Given the context in this case, what are the increased risks?

Scenario 3.1 (note: this scenario 3.1 is to be considered as a separate case)

On the industrial site a project within an installation has been launched to enhance the energy efficiency within one of the production units. Initially 1000 TJ heat was imported from Utility-A (separate legal entity) and 15 TJ of condensate returned. The initial installed capacity and activity level (AL) within the heat-benchmark is 985 TJ/year.

Due to the additional installation of a heat exchanger 120 TJ energy is saved whilst the production of PE remains unchanged – as such the heat import is reduced to 880 TJ/year.

The Member State has implemented legislation that requires the operator to include further elements in the approved MP pursuant to Article 12(3) MRR in order to meet the requirements of Article 24(1) of the CIMS. No notification of the changes was made to the CA.

(note: For this scenario the TJ are illustrative and not related to capacities indicated in scenario 3.0).

**PE heat consumption before and after the installation of a heat exchanger:**

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 TJ</td>
<td>880 TJ</td>
</tr>
<tr>
<td>AL 985 TJ</td>
<td>AL 865 TJ</td>
</tr>
<tr>
<td>Heat consumer</td>
<td>Heat consumer</td>
</tr>
<tr>
<td>15 TJ</td>
<td>120 TJ</td>
</tr>
</tbody>
</table>

**Questions scenario 3.1**

3.1a What information does the verifier need to verify and to what extent?

3.1b Is the change to capacity significant as mentioned in Commission Decision 2011/278?

3.1c What is the impact on the verification report?
Scenario 3.2 (note: this scenario 3.2 is to be considered as a stand-alone, separate case)

On a different industrial site, a production unit within an installation consumes annually 200 TJ (ETS supplier) heat (basis for initial allocation). A project was launched to import heat 120 TJ via a pipeline from various non-ETS heat suppliers. There is no physical change to the heat consuming entities, and the boiler is not changed. Hereby the heat import from the ETS site is reduced to 80 TJ. The heat consumption remains at 200 TJ. (note: For this scenario the TJ are illustrative).

The Member State has implemented legislation that requires the operator to include further elements in the approved MP pursuant to Article 12(3) MRR in order to meet the requirements of Article 24(1) of the CIMS. The procedure includes situations when the CA needs to be notified as well as the deadline within these events need to be communicated. No notification of the changes was made to the CA.

Questions scenario 3.2

3.2a What information does the verifier need to verify and to what extent?
3.2b Is the change to capacity significant as mentioned in Commission Decision 2011/278?
3.2c What is the impact on the verification report?

Scenario 3.3 (note: this scenario 3.3 is not related to the above situations)

In another situation, an installation uses various fossil fuels for the production of heat used within its own production process.

During the verification the operator of the installation indicated that the annual heat consumption for the reporting year was 250 TJ. The historic activity level (HAL) based upon the median (2005-2008) was 601 TJ. During the verification the operator indicated that the decrease in heat consumption/production is due to unfavourable economic circumstances.

This sub installation (heat benchmark) accounts for more than 30% of the total allocation granted. The Member State where the operator is operating requires that the MP provides a summary of a procedure ensuring the following: (a) the operator regularly checks if information regarding any planned or effective changes to the capacity, activity level and operation of an installation is relevant under that Decision; (b) the information referred to in point (a) is submitted by the operator to the CA by 31 December of each year. (Note: For this scenario the TJ are illustrative and not related to capacities indicates in scenario 3.0).

Questions 3.3

3.3a What type of change has occurred that needs to be reported to the CA?
3.3b What information does the verifier need to verify and to what extent?
III.1 Model answers for Scenario 1, i.e. instructions to trainers

Power Generation

Scenario 1 introduces the base case: a heavy fuel oil fired (HFO) power station generating electricity for export to the national grid and steam for industrial use. It is a combustion installation under Annex I of the EU ETS Directive, i.e. a category B installation since it produces 285,300 tonnes CO₂ per year. The installation boundaries (e.g. source streams, emission sources etc.) as well as the monitoring methodology are explained in the context of the scenario.

Relevant considerations to address the initial question 1a:

Article 7(4) of the AVR outlines the scope of verification. The verifier is required to assess:
- The completeness of the emission report and its compliance with Annex X of the MRR;
- Compliance with the approved MP and the permit;
- Whether the data in the AER is free from material misstatements;
- Information in support of improving the operator’s performance on monitoring and reporting.

The verifier must apply reasonable level of assurance (Article 7(1) AVR) and the materiality level is 5 % for Category B installations (Article 23 AVR).

Question 1a as asked in Scenario 1

What questions should a verifier ask itself to determine the depth and scope of verification for this year? What elements are important given the information in the context?

A verifier confronted with this scenario should ask itself:
- Do the installation’s boundaries as listed in the MP reflect the actual situation on site?
  - What is the latest approved MP, and are all emission sources and source streams of the installation covered in the latest approved MP?
  - Are all source streams (including de-minimis) included in the approved MP? Reading the context, what would you consider major, minor and de-minimis source streams?
  - Are all emission sources (e.g. technical units) included in the approved MP, including the portable combustion units used during maintenance?
  - Are the emissions from all source streams and emission sources included in the total emission figure in the emission report?
- What are the risks of misstatements and non-conformities (how high are the inherent and control risks in the accounting process)? Please see KGN II.2 on the risk analysis on how to assess the inherent risks and the control risks. These issues will also come up in the next questions.
- Do the monitoring methodology, control activities, and the procedures reflect the approved MP?
- If the approved MP does not reflect the actual situation on the ground: is there communication between the CA and the installation?
- What are the results of previous verification? Is there an improvement report from previous year? (this information will be asked partially in the pre-contract stage). And has it been acted upon in accordance with the agreed deadlines?

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11 Category B installations are installations, where the average verified annual emissions of the trading period immediately preceding the current trading period, with the exclusion of CO₂ stemming from biomass and before subtraction of transferred CO₂, are more than 50,000 tonnes of CO₂(e) and equal to or less than 500,000 tonnes of CO₂(e).

12 Portable combustion units for temporary use are still to be considered stationary units and should be accounted for. These are not mobile machinery for transportation purposes as mentioned in Article 20 MRR (see section 2.3.1 Guidance on the interpretation of Annex I Directive). Units are only considered mobile if the purpose of the fuel burn is to power the wheels.
**Question 1b as asked in Scenario 1**

**What additional information should the verifier ask for to allow it to determine the depth and scope of verification sufficiently?**

- The MP: the verifier needs to determine for example if the installation boundaries described in the MP reflect the reality on the ground (e.g. source streams, emission sources, diagram) – (note: it is possible that changes have occurred to the physical or organisational structures since the MP was approved by the CA);
- The data flow diagram/ description outlining step by step the route data takes from generation to reporting via any manipulation;

**Answer:**

The verifier should for example expect:

- that all sources have been included in the MP, no matter how small  (e.g. acetylene used in maintenance welding);
- the correct categorisation of emission source streams into major, minor and de-minimis source streams;
- whether data gaps and double counting occur because emission sources or source streams are lacking or have been incorrectly defined in the MP or in the emissions accounts;
- whether emission sources and source streams listed in the approved MP reflect the actual situation in the installation.

The proper level of confidence on the completeness of the emission sources and source streams as well as the correct delineation of boundaries can be confirmed through a walk-around; inspection of the emission sources and source streams of the installation; and review of relevant contractual, lay-out plan documentation and piping and instrumentation diagrams, followed by cross-checking the data on source streams and emission sources with external data sources (e.g. fuel supplier data for installations), other data verification checks, and plausibility checks).

When undertaking the verification, in particular if done for the first time, the verifier should make a thorough inspection to check the completeness of source streams and emission sources. The verifier should not solely restrict itself to what is in the MP but also thoroughly check and consider the actual situation of the installation by means of a walk over inspection.

For very large installations with numerous de-minimis source streams the verifier should base its assessment on the risk analysis and sampling and consider the likely smaller sources for that type of installation that might be omitted. See section 5 KGN II.4 on sampling and KGN II.1 on scope of verification.

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**Additional question you as moderator/trainer can raise in the discussion:**

- To what extent do verifiers check (or should check) the completeness of emission sources and source streams?
- Would they check every single source stream, including de-minimis source streams or take a sample in checking these source streams?
- What specific checks would you expect to do as a verifier?

**Answer:**

The verifier should for example expect:

- that all sources have been included in the MP, no matter how small  (e.g. acetylene used in maintenance welding);
- the correct categorisation of emission source streams into major, minor and de-minimis source streams;
- whether data gaps and double counting occur because emission sources or source streams are lacking or have been incorrectly defined in the MP or in the emissions accounts;
- whether emission sources and source streams listed in the approved MP reflect the actual situation in the installation.

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**Additional question you as moderator/trainer that can raise in the discussion:** what to do if the emission sources and source streams do not reflect the ones listed in the approved MP?

**Answer:**

The verifier must consider this as a non-conformity which needs to be corrected by the operator. If not corrected, the verifier must report this in its verification report as a non-conformity. If the non-conformity leads to material misstatement or if Art. 27(1) (d) is applicable, the report shall not be verified as satisfactory.
• Details of the internal QA/QC processes being applied;
• More information on the inherent risks and control risks involved, including the operator’s risk assessment. Robustness of control activities etc.

**Question 1c as asked in Scenario 1**

**What is the category of the installation and the materiality level to be applied?**

The installation is a category B installation (Article 19(2) MRR) and the materiality level is therefore 5% (Article 23 AVR)

**Question 1d as asked in Scenario 1**

**What role does the materiality level and materiality considerations play in determining the scope and detail of verification? How is this connected to the verifier’s risk analysis?**

This question is connected with the verifier’s risk analysis. The risk analysis centres around identifying, assessing, quantifying and managing two types of risks, i.e. inherent risks and control risks. On the basis of its assessment of these two risks, the verifier needs to determine the nature, timing and depth of the verification activities and, through those activities, lower the verification risk to an acceptable low level in order to be able to issue a verification report with reasonable assurance that the operator’s report is free from material misstatements. (i.e. they need to do enough work to have confidence in the results of their tests and conclusions)

When assessing the inherent risks and control risks, the verifier will also look at the magnitude of these risks, ranking them as high, medium and low risks in relation to:

- their likelihood to give rise to material misstatements and their impact on the reported data (e.g. what is the likely material contributor to the emissions, which data points represent a significant quantity of total reported emissions), and
- the risks that the control activities may not function properly (especially in abnormal circumstance) so that material misstatements may arise (control risks).

See KGN II.2 on risk analysis for further information on how to assess inherent and control risks.

The greater the risk of a material misstatement as a result of high inherent and control risks, the more extensive the number and type of verification activities (testing, sampling) needs to be because only by applying more verification activities will the verifier either detect those misstatements or reach an opinion with reasonable assurance that they do not exist.

The detection risk that “results” from the relationship indicated above determines the verifier’s judgment on the sampling size. So, if the inherent risk and/or the control risk are low (low risk of material misstatement), the verifier is in a position to accept a higher detection risk, requiring fewer samples.

However, if the combination of inherent and control risks is high (high risk of material misstatement), the verifier should aim for a low detection risk in order to be sure that it will detect the misstatements as much as possible. One has to realise that the detection risk should be set at a lower level in the case that the materiality level is 2% (i.e. the level for Category C installations), as compared to a materiality level of 5%, (i.e. the level for Category A and B installations). The relation between the detection risk and the materiality level is illustrated in the figure below.

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13 Verification risk is the overall risk that the verifier issues an inappropriate verification opinion. It consists of three components, i.e. inherent risk, control risk and detection risk.
Materiality thus plays a role in the planning of the verification activities, determining the focus of verification and sampling. In this case the following steps will be taken:

The verifier should first consider the category of the installation, a category B installation with a materiality level of 5%.

Secondly the verifier will identify the data points which individually represent a significant quantity of the total reported emissions, e.g. major source streams versus minor source streams, or those data points that are significant because of their nature.

Fuels in this context are:
- HFO for boilers
- Propane for start-up
- Gas oil for gas turbines
- Propane for heating workshop
- Gas oil for fire-fighting pumps
- Gas oil and propane for maintenance units

As mentioned above: the verifier will identify the major, minor and de-minimis source streams

Data points that are significant because of their nature are treated separately and the size of each sample is taken in relation to the contribution and risk assessed for the data points. From the remaining population (e.g. de-minimis source streams) sufficient checking will have to be done to confirm that the data inputs and outputs are reasonable and have a basis in evidence.

Thirdly the verifier will identify, assess and quantify the inherent and control risks. Because of the complex data flow and collection process, the main focus of the verification should be on HFO (higher inherent risk). Then the detection risk will be determined.

**Question 1e as asked in Scenario 1**

*Given the context in this case, what inherent and control risks should the verifier need to identify and on what elements should the verifier focus its verification checks? Please indicate the reasons why the verifier should focus on these elements and indicate what questions the verifier should ask itself when*
identifying the risks and determining the scope. Identify and quantify the inherent, the control and the detection risks

Participants should ask themselves generic questions about what they would be looking for in terms of inherent and control risks.

Examples of inherent risks are:
- The relevance and proportional size of the emissions related to emission source streams or emission sources. Source stream HFO used by the boilers and gas oil used by the gas turbines are larger, and the impact on emissions greater affecting the magnitude of inherent risks. It is important to check the categorisation of source streams (major, minor and de-minimis);
- Risks of not including emissions from the portable but not mobile combustion units, although the impact on the total reported emissions is not great;
- Risks of inaccurate measurements and not accounting for fuel density and temperature (especially in relation to the bulk tank storage for volumetric adjustments);
- Risks of not having the correct default values for Emissions factors and NCV for Gas Oil and Propane;
- Risks of stock balances not matching up;
- Complexity of operator’s operations (in scenario 1 the operations are not complex).

Examples of control risks are:
- Controls in place concerning an external lab. Is the lab accredited according to ISO 17025? If not what would the verifier do to test the quality of the results returned from the lab?
- Cross-check measurements of changes in bulk tank by manual tank dips. Cross checks performed by incompetent personnel, measurements not read correctly, temperature not taken which means tank table adjustments for volume cannot be made.

Focus of verification checks:
- Major source streams but don’t forget the smaller ones and emissions from portable (but not mobile) plant;
- Testing of the control activities (focus on manual checks and anywhere that involves human action);
- Measurements of heavy fuel oil (ship and bulk tank levels, changes in bulk tank stocks). The verifier should check whether uncertainty requirements have not been exceeded, information used to calculate the uncertainty levels, measurement equipment used to measure the heavy fuel oil, whether fuel density and temperature has been taken into account;
- Checks on whether correct default values for emissions factors and NCV for Gas Oil and Propane were used;
- Checks on the competence of labs (depending on type of lab);
- Checks on delivery notes from supplier for Gas Oil and Propane.

Additional question you as moderator/trainer can raise in the discussion: How would the verifier test evidence of technical competence and quality control of a non-accredited lab and accredited lab?

Answer: See question 4.1 and 4.2 FAQ AVR.
**Question 1: as asked in Scenario 1**

*What would be the scope of the test plan and the data sampling plan in the verification plan to test the fuel accounting data (i.e. what fuels and other issues should be included and how much of the data should the verifier test—and why?)*

When testing the fuel accounting data, the verifier will check the data and test the control activities in place. For both issues sampling can be applied.

The verifier shall design its test plan and determine the sample size and sampling activities for testing the control activities, based on its assessment of:
- the inherent risks;
- the control environment;
- the relevant control activities;
- the requirement to deliver a verification opinion with reasonable assurance.

Similarly, the verifier shall design the data sampling plan and determine the sample size and the sampling activities related to the data points underlying the aggregated emissions, by considering:
- the inherent and control risks; and how well the operator’s internal QA/QC processes are designed and applied;
- the results of the analytical procedures such as trend analysis, year on year (or month on month) comparisons etc.;
- the requirement to deliver an opinion with reasonable level of assurance;
- the materiality level;
- the materiality of the contribution of individual data element to the overall data set.

When both the inherent risks and control risks are high, the verifier has to apply more detailed and robust verification activities and has to select a larger sample to lower the detection risk. The sampling size for testing control activities is established differently than for data sampling.

Determination of the sample size for testing the control system as presented in the approved monitoring plan depends on the frequency of the internal control tests and the control activities, and the number of items that need to be controlled. **The frequency of the control activity** means how many times a control activity is being carried out. **The number of items** refers to the number of data points and data flows that are being controlled by the control activities, e.g. how many measurement instruments are being used, how many calibration reports there are, how many documents there are in the documentation management system etc.. Section 5 of KGN II.4 on sampling provides an example.

The data sample size depends then directly on 3 parameters:
1. the confidence level that the verifier aims to achieve in relation to reasonable assurance;
2. the variability of the population the verifier has identified;
3. the hypothetical error set by the verifier related to the maximum materiality level.

For determination of the sample size the verifier can make use of generally accepted software or relevant statistical analysis approaches.

The verifier shall update the risk analysis and the verification plan, and adapt the verification activities and sampling size when it finds additional risks that need to be reduced (e.g. when tests fail) or when there are less actual risks than earlier expected.

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**Additional questions you as moderator/trainer can raise in the discussion:**
- If there are large variations in the quantities of HFO delivered, what would be the impact on sampling? Or, if there are no deliveries of HFO in the year, what impact would that have on the uncertainty analysis for the fuel measurement where stock accounting is included?
- What type of control activities would the verifier expect the operator to have implemented?
- What if the verifier identifies misstatements or non-conformities in the verifier’s sample size?

Trainers are invited to ask other additional questions to prompt the discussion if this is necessary.

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14 The verification plan consists of a verification programme, a test plan and a data sampling plan (Article 13 AVR)
**Question 1.1a**

**What questions should the verifier ask itself when confronted with the changes in the operation of the installation that occurred during the reporting year?**

- Have the changes to the MP been notified to the CA? Were the changes significant changes to the MP and if yes were they approved by the CA? *(Adding new source streams is a significant change to the MP and should be subject to CA approval, even if it is only a test fuel burned for a short period).*
- Has the operator’s risk assessment been updated to account for the new fuels? What did the operator identify as the inherent and control risks involved?
- Can the four fuels be regarded as bioliquids as defined in the MRR?
- Did the operator use an emission factor of zero for the four fuels and was this justified because the bioliquids met the sustainability requirements mentioned in Article 17 of the RES Directive?
- If the operator used an emission factor of zero, what evidence did it present to demonstrate that the bioliquids used meet the sustainability criteria?

**Additional question you as moderator/trainer can raise in the discussion:** What should the verifier do if the changes to the MP have not been approved by the CA?

**Answer:**
The verifier checks whether the change has been notified. If not, the verifier recommends that the operator notifies the change to the CA. The operator has to correct the non-conformity. If the non-conformity is not corrected and the MP not updated before issuing the verification report, the verifier needs to report this in the verification report as a non-conformity. It is also a non-compliance with the MRR. The report is not verified as satisfactory if the non-conformity leads to material misstatement.

**Question 1.1b**

**What additional implications does the operator’s claim have that these alternative fuels are bioliquids with non-reportable (i.e. zero-rated) emissions for the verification?**
The inherent risks are increased because the verifier needs to check whether the operator has demonstrated sufficiently that the bioliquids meet sustainability criteria and whether reporting zero rated emissions was justified. This means that the verifier’s risk analysis should be adapted and the verification plan should be adjusted. The detection risk must be set lower because of the increased inherent risk which means more detailed verification activities focusing on the bioliquids.

**The verifier should check and address following issues:**

- Can the Rape seed oil, Tall oil or Cashew nut oil come from a source that has a sustainability compliance scheme associated with it? If so did the fuel used come from that source? Has a certificate been obtained as part of the supply? Was the certificate issued by a national certification system, or by a voluntary certification scheme that is recognised by the Commission? Was the certificate still valid at the time that the fuel was burnt? Is the geographical scope of the rape seed oil or other oil in line with the scope identified in the certification scheme?
- What if a certificate was not issued? In that case, did the operator demonstrate compliance with a national system by other means: e.g. evidence of a third party chain of custody audit\(^\text{15}\), did that audit cover the full scope that would be required by MRR, and was the result of the third party audit acceptable?
- Reclaimed oil is a fossil fuel and would not count as a bioliquid. So the emissions from reclaimed oil will not be zero rated. If Rape Seed Oil is claimed as bioliquid, this is a non-compliance with the MRR and should be corrected by the operator;

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\(^{15}\) Chain of custody audit means that there has been an audit check back though each stage from the installation to the original supplier and that all evidence is in place to show at each stage that the fuel meets the sustainability requirements; and that evidence is associated with a specific batch of fuel and this has been passed along the chain of supply.
• Were the bioliquids fired as pure fuels or in a mix with the HFO? If the latter is the case, the emissions must be allocated into fossil and non-fossil components e.g. by a mass balance split of HFO and Bio-HFO. The following options apply:
  a) **Fossil / bioliquid mix where sustainability criteria apply and are not satisfied:** The emission factor to be used in this case for all of the fuel is the emission factor based upon the carbon composition of the blended fuel (or the equivalent factor for each fraction HFO and other ‘bioliquid’ fuel); i.e. there is no zero factor to be applied;
  b) **Fossil / bioliquid mix where sustainability criteria apply and are satisfied:** The emission factors to be used in this case are zero for the bioliquid fraction and emission factor based upon the carbon composition of the HFO for the HFO fraction;
  c) **Bioliquid mix or fossil / bioliquid mix, where only a part of the bioliquid satisfies applicable sustainability criteria (i.e. part does not):** the emission factor to be used in this case is the emission factor, based on each of their compositions, for the proportion of the mix corresponding to the fossil fraction and the part of the bioliquid not fulfilling the applicable sustainability criteria; the proportion of bioliquid meeting the sustainability criteria would use a factor of zero.

• The delineation of the biomass source streams. If the operator uses bioliquids that are delivered in batches, the verifier should check whether these batches of source streams are considered or should be considered as different source streams; and/or that the composition analysis used for the emission factor relates to (and is applied only to) the individual batch that is burnt.

See MRR guidance document 3 (GD 3) and section 4.3 of KGN II.3 on process analysis.

Discussion could also evolve on how the verifier would check these elements.

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16 The definition of bioliquids under EU ETS is liquid fuel for energy purposes other than for transport, including electricity and heating and cooling, produced from biomass (Article 3(21) MRR). Please note that not all liquid biomass are necessarily deemed bioliquids under the definition of EU ETS. If no sustainability criteria apply according to the RES Directive, the emission factor to be used is the emission factor that applies solely to the fossil fraction of the mix.
III.2 Model answers for Scenario 2, i.e. instructions to trainers

Power Generation is attached to a Refinery

In this Scenario 2, the Power Plant and a nearby Refinery are part of the same industrial complex under the same holding company.

Question 2a as asked in Scenario 2

What consequences do the changes in the context of Scenario 2 have for the required competences of the verifier?

Extension of the scope of accreditation is required: group 2 refining of mineral oil (Section 6.1 EGD I)

For examples of required competences please see Annex I of KGN II.7 on competence.

Question 2b as asked in Scenario 2

Given the context in this scenario, what inherent and control risks should the verifier identify and on what elements should the verifier focus its verification checks? Please indicate the reasons for focusing on these elements and indicate what questions the verifier should ask itself when identifying the risks and determining the scope and detail of verification.

The first question that the verifier is expected to ask itself is whether this is one or two installations. There are several different options that can be found in real life all of which impact the approach to be taken to the verification and whether there is more than one verification, e.g.:

- This is one installation controlled by a single operator and covered by one permit – this would be a single verification covering both the refinery and the power plant.
- This is one technical installation but the power plant operation is contracted out to a third party; whether this constitutes one operator and one permit under the EU ETS depends on who has control of the power plant and who has decisive economic power over the installation (in the general sense this is related to who has H&S responsibility and the decision making powers over the day to day operations of the plant). The permit(s) will show whether it should be interpreted as one operator with one/two installations at the same site or two separate operators with two permits.\(^\text{17}\) However it could be that the permits are not up to date. In general, if the operator of the refinery also controls the power plant then this would be one ETS permit, but if a third party controls the power plant then this would be a situation with two ETS permits. Depending on the circumstances this could be one or two verifications; the accounting and control processes could be very different if two different parties run the two parts of the emissions accounting process (refinery & power plant emissions).
- This is two installations, each owned and operated by a separate legal entity and a separate operator under the same holding company but with their own management and accounting processes.

For any of these scenarios the verifier should expect there to be interface arrangements as it is possible that there could be shared source streams e.g. the refinery might supply HFO to the power plant from its product/intermediate products etc. The verifier should ask for the permit(s). However please note in the discussion that the permits might not be up to date in which case the verifier will have to do additional checks and refer the operator to the CA.

\(^\text{17}\) Article 6 EU ETS Directive states that a greenhouse gas emissions permit may cover one or more installations on the same site operated by the same operator. Whether or not there are multiple installations on the same site or one installation depends on how the activities are technically connected. Installation’ means a stationary technical unit where one or more activities listed in Annex I are carried out and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution.
Taking account of the different owner/operator contexts given above, the verifier needs to consider the different risks:

**Inherent risks include:**
- Additional source streams and emission sources. The total emissions of the power plant and the refinery make it a category C installation. But also the refinery alone is already a category C installation;
- Complexity of the data flow: e.g. RFG derived from off gases collected from various processes;
- Complexity of installation boundaries – would the site, i.e. the refinery plus the power plant, be considered as one installation or multiple installations? (see commentary above);
- Complex data management systems: e.g. multiple spreadsheets, Distributed Control Systems (DCS), Plant Information Systems (PI) as well as potentially ‘black box’ databases.

**Control risks include:**
- Meters measuring RFG and Natural Gas not functioning properly; especially temperature and pressure probes which impact volumetric to mass conversions;
- Online gas analysers not functioning properly; not being calibrated with certified gases or the calibration gases being out of validity;
- Technical competence of external lab – Is the lab accredited or not? Non-accredited lab means additional checks (see question 4.2 FAQ AVR);
- Competence of personnel carrying out control activities;
- Quality of management of the refinery; the way the control activities in the refinery are organised and maintained; the number of different people involved in aspects of data flows and QA/QC; the quality of the internal communication and training, as these are often not seen to be properly arranged in refineries and could have weak points and thus control risks.

There are a number of high inherent risks/ control risks involved with some steps in the data flow of the refinery: e.g.
- Each refinery is a complex installation with various process units, source streams, emission sources, control systems and a huge data set, in first instance developed to control the process conditions and thus with different control objectives which have to be aligned with the control and quality objectives of emissions trading. Some of the input materials might be both a source stream for combustion and product material input (e.g. CH₄ for H₂ production);
- For example the RFG is 51.3% of the fuels used and is collected from several process sources with different gas composition. The likelihood of giving rise to material misstatements is high because in each refinery the data collection system and the data flow are unavoidably complex; the impact on the reported data is high. In addition, the homogeneity of the RFG depends on whether there is a single point of blending and a ring main around the refinery or whether there is no ring main and multiple different points at which RFG is fed into the heaters etc. (meaning the emission factor could be different for each RFG source). In addition in this scenario, Natural Gas is used for pressure balancing in the RFG ring main and so does not necessarily constitute a source stream on its own;
- Transfer of continuous meter readings of RFG to the PI system (via Flow Computers and DCS) which is then downloaded in multiple spread sheets and/or databases: High inherent and control risk because of the complexity of data management and data flow, and the likelihood of misstatements as well as high impact on reported data; more so if there is an element of manual transfer of data within the data flow and/or manual data validation/ substitution of data;
- The extensive use of computer systems (both process control and ‘Microsoft’ type desktop applications) means that the risk of a breakdown of control within IT systems is high, verifiers should be looking for archive, backup systems, access control and other IT System and Information Security mechanisms;
- Determination of the quantity and composition of the gas being flared during upset conditions, as this is very dependent on duration of outage and the vessel/process that has been blown down to the flare. The likelihood to misstatement is high, although the impact on the reported emission of the refinery may be low.
On the basis of its assessment of the inherent and control risks, the verifier needs to determine the nature, timing and depth of the verification activities and, through those activities, lower the verification risk \(^{18}\) to an acceptable low level in order to be able to issue a verification report with reasonable assurance that the operator’s report is free from material misstatements.

The greater the risk of a material misstatement as a result of high inherent and control risks, the more extensive the number of verification activities (testing, sampling) needs to be. The materiality level of 2\% means that the detection risk must be set even lower (see picture in answers to question 1d in Scenario I). The verification should in particular focus on those areas that have the higher risks.

\begin{question} \textit{How would the verifier check on whether the industrial complex is one installation or multiple installations on one site? If the industrial complex contains two installations, can a single audit be carried out and what questions would be relevant?} \end{question}

The permit issued by the CA contains information on whether the industrial complex should be considered as one installation, multiple installations governed by the same operator on the same site or multiple installations governed by separate operators. The verifier should check the MP and the installation boundaries to confirm this. Note that, due to restructuring or reorganisation, it is possible that a single installation may become multiple and vice versa. Verifiers must therefore ask appropriate questions to be ensured that the MP and permit are still up to date.\(^{19}\)

A single verification is not allowed if this is a site with multiple installations governed by separate operators. Each operator’s report must be verified by a verifier and requires a separate verification with its own specifics. Group verification and group sampling between installations is not allowed under the AVR. However there may be commonalities in operator’s procedures and QA/QC management which would allow for a combined approach and a single site visit / set of interviews: e.g. checking common procedures, interviewing the same personnel, combining site visits at the same time etc. So it is possible for one set of site activities to be conducted by the same verification team but for each operator of the installation a separate set of internal verification documents, separate independent review and separate verification report will be required.

\begin{question} \textit{In recognition of the more complex installation boundaries compared to Scenario 1, what additional checks are likely to be necessary in relation to the MP?} \end{question}

Focus of the verification additional checks should in particular be on:

- The installation boundaries (assessing the permit and MP on whether it is a single installation or multiple installations at the site, i.e. operated by the same management or operated by separate management organisations whereby each installation has its own management organisation and responsibilities, or whether part of the installation is operated under responsibility of a separate management, e.g. the operation of the power plant is outsourced (this can the case with an embedded power station);
- The completeness of source streams and emission sources, checking the correct categorisation of the source streams, and whether the emissions of all source streams and emission sources are covered in the emission report;
- The data management system: in particular the transfer of data to spreadsheets and data bases, possibly with various data transfers between different operating systems used in the control rooms of the refinery. The more automated the system (i.e. removing human manual transactions) the more robust it is likely to be;

\(^{18}\)Verification risk is the overall risk that the verifier issues an inappropriate verification opinion. It consists of three components, i.e. inherent risk, control risk and detection risk.

\(^{19}\)See Article 10 AVR
• IT systems used for transferring data to the administrative systems used in the refinery (and how these are controlled to avoid deliberate or accidental error – e.g. access controls);
• Meters, online gas analysers, evidence of technical competence of lab (what to check depends on whether the lab is accredited or not);
• Whether the monitoring methodology is in line with the (latest version of the) MP;
• The competence of personnel involved in M&R (from front line operators taking samples and maintaining instruments, through to the data co-ordinator responsible for final calculations, checking and reporting).

**Question that can be raised in the discussion:** how would you perform those checks?

**Answer:**
Please see KGN II.3 on process analysis on how to check the data flow, control activities, procedures and the monitoring methodology

**Question 2e as asked in Scenario 2 (consisting of two sub-questions)**

On the basis of the information provided how should the verifier expect the operator to have classified its source streams in terms of major – minor – de-minimis?

The operator has to classify all source streams for which it uses calculation based approaches. For this purpose, it must compare the emissions of the source stream with the “total of all monitored items.” The following steps have to be performed as outlined in section 4.4.3 MRR Guidance Document 1.

- Determine the emissions associated with the “total of all monitored items.” Only CO\(_2\) from fossil sources is to be taken into account for this calculation. Transferred CO\(_2\) is not subtracted from the total;
- Sort the data to list all source streams in descending order of CO\(_2\) emitted;
- Apply the percentage and tonnage thresholds (see below) to determine categorisation. Note - the operator may select source streams which he wants to be classified “minor” or “de-minimis” source streams, in order to apply reduced requirements to them. This may be a slightly different set than just taking the sorted order of sources, provided that the thresholds are not breached.

The operator may select as minor source streams: source streams which jointly correspond to less than 5 000 tonnes of fossil CO\(_2\) per year or to less than 10% of the “total of all monitored items”, up to a total maximum contribution of 100 000 tonnes of fossil CO\(_2\) per year, whichever is the highest in terms of absolute value.

The operator may select as de-minimis source streams: source streams which jointly correspond to less than 1 000 tonnes of fossil CO\(_2\) per year or to less than 2% of the “total of all monitored items”, up to a total maximum contribution of 20 000 tonnes of fossil CO\(_2\) per year, whichever is the highest in terms of absolute value. Note that the de-minimis source streams are no longer part of the minor source streams.

All other source streams are classified as major source streams.

Given the information in the context this means that:

- LPG, gas oil, acid gas and CRU Regen Coke are de-minimis source streams
- HFO and Refinery flared gas are minor source streams
- Refinery Fuel gas and FCCU Coke are major source streams

**How should the verifier go about checking that this is correct?**

- Checks on whether the categorisation as laid down in the approved MP reflects the actual situation using the operator’s declared value as the total against which percentages are created;
• Checks on whether one or both the thresholds (% or mass) of de-minimis and minor source streams have not exceeded in the selection of minor and de-minimis source streams;
• Checks on completeness of source streams and procedures for data flow activities in relation to the installation’s data flow diagram of the emission sources, source streams, sampling points and metering equipment.

**Question 2f as asked in Scenario 2**

*What information would the verifier need to determine its approach to testing internal controls over the data accounting process? What sources of evidence would the verifier need? And how would the verifier decide where to focus its attention?*

The verifier needs to ensure that it has the ‘whole picture’ of the data accounting process, meaning that for each source stream it has answered the following two questions in sufficient detail to determine the inherent and control risks (i.e. the likely strengths and weaknesses):

• What is needed for each step and data point in the data flow to get to the final report - from point of generation, through manipulation to summation for the report? This needs to include all stages of equipment, spreadsheets etc.
• What internal control checks are done, by whom and when at each stage of the flow identified above?

Evidence would include things such as:

• What instruments generate the data point, how are these maintained and how is the quality of the instruments controlled (and what happens if they go wrong)?
• Copies of each spreadsheet that the data point ‘goes through’ on its journey towards the final report.
• Discussions about validation checks with the people who do them etc.

Deciding where to focus efforts will be based on:

• The magnitude of the contribution of a source stream to the total emissions (the larger the contribution the more important the check that the quality is good);
• The level of automation - even if a source is large it may not require significant checking once initial checks have been made to confirm that the basis of automation is sound (including logic for automated adjustment of data within the plant information system etc.). The more human intervention the greater the potential for weakness;
• Magnitude of inherent and control risks (e.g. High, Medium, Low risk);
• Materiality level, which in this case is 2%;
• Information on the robustness of the control environment and the relevant control activities e.g. are there good internal audit and effectiveness checks happening which means that problems are caught early by the operator?;
• The requirement to deliver a verification opinion with reasonable assurance.

**Question that can be raised in the discussion:**

How to sample when testing control activities? Where should the focus be?
How to ensure representativeness of sampling?

Trainers are invited to ask other questions to prompt discussion where this is necessary or appropriate.

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**Question 2g as asked in Scenario 2**

*What information would the verifier need to determine its approach to data sampling for the installation described? What sources of evidence would the verifier seek?*

The verifier needs to ensure that it has the ‘whole picture’ of the data universe from which samples are to be selected: i.e. it must know all the source streams, how much data is within each source stream data set and the ranking of the data from largest to smallest set.
Data may be generated at monthly, weekly, daily or even down to 30 second data point intervals. Assessment is needed to determine the level at which it is appropriate to conduct data checks. E.g. RFG is usually measured at 30s intervals but within PI an average is taken for the day or for the flow per hour. Assuming that checks on PI have indicated that the averages are correctly calculated it is reasonable to look at daily, weekly or even monthly averages. With an electronic system such as PI it is possible to get a new download of data to compare to that in the records provided to the verifier, this can be done using electronic means so the verifier might easily test a large data set as compared to checking the manual transfer of data from invoices, for example.

Before deciding the depth of checking the verifier needs to check the internal control processes. If the verifier has confidence that the internal validation processes of the operator are robust and are picking up anomalies appropriately, then it is reasonable to test a smaller proportion of the data set.

For small sets that are significant contributors to the total emissions 100% checks may be appropriate (e.g. a gas fired power plant with 12 invoices).

- The materiality of the contribution of an individual data element to the overall data set;
- Magnitude of inherent and control risks;
- Materiality level which is 2%;
- Results of analytical procedures.

**Question that can be raised in the discussion:**

How to ensure representativeness of sampling?
Which sampling method could be suitable in this case?

**Trainers are invited to ask other questions to prompt discussion where this is necessary or appropriate**

**Question 2h as asked in Scenario 2**

**How would the verifier check the appropriateness of the flare gas quantity and quality determination, and how and what should the verifier need to check the quantity of purge gas used?**

There are three different sources of gas to flare, i.e. pilot gas, purge gas and flared gas from a process incident:

- Pilot gas is used to maintain the flame and is generally natural gas or RFG. In the event that there is not a meter on the pilot line then the verifier would need to see evidence of the design capacity of the flare which should specify the minimum gas flow to keep the pilot flame alight. Where engineering information is being used it is reasonable to expect a conservative adjustment factor to be applied to ensure no understatement. Where RFG or NG is used then it is reasonable to assume that the composition is the same as that for the gas used in the rest of the refinery;

- Purge gas is used as a safety feature. This gas can be hydrocarbon but is often Nitrogen (in full or part); if the gas contains Nitrogen and the carbon content is determined by measuring the concentration of the gas, the volume of nitrogen should not be deducted from the volume flow to be multiplied against the concentration measurement (otherwise the mass CO₂ emissions will be over-estimated). If this is not the case, the volume of Nitrogen should not be included in the total gas flow for the calculation of CO₂ emissions and a deduction calculation is required. Again, if there is no meter on the purge line, then design engineering information is a reasonable basis for determining the amount of gas that should be deducted; the conservative adjustment factor this time is to lower the amount of the gas to ensure less is deducted meaning the assumption is that more gas is hydrocarbon. Alternatively, a nitrogen mass balance can be done across the installation with any loss being assumed to be purged;

- Flared gas. If there is no meter on the flare gas line then an estimation would be required based on the volume of the vessel that has been blown down to the flare and the design composition of the gas within that vessel. This is usually done by the Unit process engineer who would use PI information to determine the start and end of the flare incident and design information on
volume and composition. The verifier needs to check carefully that these calculations are reasonable and have a basis in evidence.

The verifier needs to check that the practice on site is properly reflected in the approved MP.

Questions 2.1 related to the additional information:

Question 2.1a as asked in scenario 2

What impact might this have on the declared emissions and the conclusion of the verifier?

This depends on several circumstances:

- Is Article 23 MRR applicable? Is there a temporary deviation from the required tier that is replaced by an alternative monitoring methodology and has this been notified to the CA? If this is the case, the verifier should check:
  - how large is the temporary deviation, how long has it carried on for and what impact did it have on the emission data, i.e. the contribution of this emission source to the overall declared emissions
  - the reasons for deviating from the tier
  - the interim methodology, i.e. that the deviation does not lead to material misstatements or underestimation of the emissions
  - the measures taken to restore the conditions for applying the accurate tier, and how promptly were they taken (i.e. was the deviation discovered quickly after it commenced and then rectified as soon as possible?)
  - whether the deviation was notified to the CA taking into account the correspondence between the operator and the CA.

If Article 23 MRR was not complied with, the verifier should consider whether the error or non-compliance has material effect, depending on the individual circumstances of the misstatement. If Article 23 MRR is applied and complied with, the situation has been addressed as a temporary derogation and replaced by an interim monitoring methodology.

- Is Article 65 MRR applicable? Is there a data gap? Did the operator use a method for determining the surrogate data and complete the data gap and was this method approved by the CA? Section 4.2 KGN II.3 on process analysis explains what a verifier should check in that case (e.g. whether, if there is a data gap, Article 65 MRR was not complied with and the situation cannot be corrected by the time the verification report is issued, the verifier should take into account the materiality of misstatement: checking whether the method used to complete the missing data ensures that there is no underestimation of the emissions and the method does not lead to material misstatements).

When assessing the materiality of misstatements, the verifier first looks at the quantitative aspect: by assessing whether the materiality level of 2% is exceeded. If this is the case, the misstatement is material.

On the basis of the information provided in the scenario a rough estimate of the likely materiality can be made:

- the fuel use of the heater to the VBU is about 2.5% of the RFG consumption which is 51.3% of the total CO₂ emissions.
- The meter failed during/after the shutdown, and has not been operating properly since the first week of May; the failure was discovered in quarter 3 of the reporting year (some 5 months later) so some 5/8 months’ worth of data is suspect.

If a worse case assumption was made that the meter was not working properly the whole year and hence all the data is suspect, the impact would be approximately 2.5% of 51.3% of total emissions i.e. this would not be a material impact if the verifier would purely look at the quantitative part.

A more refined estimate can be made using the information provided by the operator on the monthly fuel consumption to the Unit measured by the meter.
However the verifier will also look at the qualitative aspect. The key question for assessing the qualitative aspect is whether the misstatement or non-conformity (individually or combined) can influence the decision of the CA. This will depend on the size and nature of misstatements and non-conformities as well as their particular circumstances of occurrence; for example, the CA may consider as material the operator’s willingness to correct the error in a timely manner, e.g. even if the error is not material, and the operator fails to or is not willing to correct the error, the CA may consider that material and instruct the verifier to conclude to that effect. The verifier will then consider several factors (e.g. whether the misstatement, non-compliance can be corrected, whether the operator refuses to correct, the likelihood of reoccurrence, the duration, whether the misstatement or non-compliance is the result of an act with or without intent, whether there is a non-compliance with the MRR. See the FAQ on classification and reporting of outstanding issues in the verification report.

In addition to assessing the impact on the data the verifier would also need to look at the internal control system to understand why the operator failed to pick up the problem in a timely manner; what part of the control system has failed and/or what improvement would be necessary to improve the quality of control in this area?

**Question 2.1b as asked in scenario 2**

*What checks should the verifier carry out to identify the likely cause of this?*

The verifier should check the planning of the preventive maintenance programme: was it in place and should it have run post the shut-down? The verifier should also check whether the operator applied internal review/validation of data (whether the operator was doing regular QA/QC on the measured data, at what frequency was this performed, whether this was carried out by competent personnel, whether this control activity was effective?). The verifier should check the procedures and other internal control activities in place to prevent data gaps from occurring.

**Question 2.1c as asked in scenario 2**

*What action should the verifier take to establish the level of the potential error; and what further information might the verifier need to do that?*

The verifier should first confirm whether this is an Article 23 MRR situation or a data gap. For Article 23 MRR situation the verifier should check whether there was a temporary deviation of a tier and whether an interim methodology was applied and notified to the CA. See question 2.1.a. If it was not notified, it is likely to be a data gap (see below).

However, if there is a data gap, the verifier should check whether:

- the data can be retrieved from another primary source (e.g. operator’s monitoring of pre/post shutdown data)
- the data can be reconstructed: For example is the data really missing or did the data get stuck in the flow computer (in that case the error would be a PI linkage problem and not a meter problem)? Or
- can the historical data be extrapolated to create proxy emissions data. The operator can for example extrapolate likely consumption and/or create a proxy against production from that unit that could be used to fill the data gap.

The verifier therefore needs information on

- whether there is a deviation from the approved tier and whether an interim methodology has been applied, and whether this has been duly notified to the CA (Art 23 MRR)
- information to confirm whether there is a data gap (see above)
- information about the size of the deviation or data gap

**Question that can be raised in the discussion:**

How does the data gap or temporary deviation to the MP affect the verifier’s risk analysis and the scope/detail of verification?

Trainers are invited to ask other questions to prompt discussion where this is necessary or appropriate
**Question 2.1d as asked in scenario 2**

Would the fact that the verifier has identified that the meter to the heater in the VBU had not been working properly since the shutdown in April (the plant came back on line in the first week of May), which had not been identified by the operator, constitute a data gap?

1. **If no, why not?**

MRR Article 32(2) states “Where online gas chromatographs or extractive or non-extractive gas analysers are used for emission determination, the operator shall obtain approval from the competent authority for the use of such equipment. The equipment shall be used only with regard to composition data of gaseous fuels and materials. As minimum quality assurance measures, the operator shall ensure that an initial validation and annually repeated validations of the instrument are performed.”

Therefore the MRR does not require that there is a daily/periodic calibration nor that the calibration gas is accredited, implying in this case that the fact that the calibration gas bottle is out of validity is irrelevant. However, if requirements are written into the Installation’s approved monitoring plan then the circumstances could be different (see **If yes**… see 2. below).

However, the failure to monitor the status of calibration gas bottles does give rise to concerns about the effectiveness of the internal control systems over this aspect of the accounting data flow; and whether there are risks in other parts of associated instrument control process.

2. **If yes, how might this be addressed by the operator and what checks should the verifier carry out to determine if this is reasonable?**

In this case the operator did not identify that the meter was not working properly and did not notify this in time to the CA (see earlier questions). It is therefore likely that there is a data gap.

The following figure in the KGN II.3 on process analysis shows what checks the verifier should make and how the operator should have addressed issues.

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**Is there a data gap?**
- Can the data be retrieved from another primary source?
- Can the data be reconstructed?
- Can historical data be extrapolated to create emission data?

**Did the operator use a method for determining surrogate data and completing the data gap as mentioned in the approved MP?**

**The verifier checks whether:**
- the methods used were appropriate for the specific situation (e.g. does it cover the whole time period, does it cover the data gap, is it appropriate for completing the gap?)
- the methods have been applied correctly
- the methods have been properly documented
- the procedure implemented for dealing with data gaps is implemented, sufficiently

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The verifier uses other primary sources, reconstructed data or extrapolated data to check the emission data

The operator needs to obtain approval from the CA for a method completing the data gaps

Approval is obtained

Approval is not obtained in time

**The verifier checks whether:**
- the methods used to complete the missing data ensures that there is no underestimation of the emissions
- the method does not lead to material misstatements

The verifier must confirm this in the verification report (Art. 27 of the AVR).
A data gap occurring several times over a longer period of time may show that the control activities are not functioning correctly. The verifier will therefore assess the frequency of data gaps occurring and the control activities implemented to avoid these data gaps. The verifier assesses whether the control activities are effective. (e.g. whether IT systems, automatically transferring data, are secure and functioning properly, whether the operator has built in manual controls and validations to ensure that no data gaps occur).

**Questions concerning additional information 2.2**

**Question 2.2a as asked in scenario 2**

*Would the fact that calibration gas bottle for one of the online analysers on the fuel system was outside its validity date, constitute a data gap?*

This depends on whether the data can be extrapolated and retrieved from other sources covered by the approved monitoring plan (e.g. different analyses or manual samples that have been taken etc.). The calibration gas is out of validity, so the result from the online gas analyser may not be fully valid and the data set could be void. The verifier should ask the operator whether there is an alternate source of relevant information that could be used to fill the data gap (e.g. a different analyser or manual samples that have been taken during the year) and whether the data gap can be corrected. Recalibration of the historical data by using a new gas bottle is not possible since this is a daily/hourly self-calibration by the instrument itself. However, the verifier might check whether there is an alternate source of data that could be used in place of the invalid online GC data; or whether there is an appropriate proxy.

**Additional question 2.2b as asked in scenario 2**

*What recommendations might the verifier make?*

There is a non-conformity (assuming the relevant procedure is in place under the approved MP) and non-compliance with Article 32(2) and 59 MRR, the requirement on calibration and likely a non-conformity. This should be reported in the verification report as such. Please note that the verifier can also make a related recommendation of improvement as well: e.g. improving associated control activities/procedures concerning this issue).

The verifier should check whether the maintenance programme or other part of the internal control system had a task to check the validity date on bottle certificates and ensure that a replacement was installed before the bottle became invalid as this invalidates the instrument’s self-calibrations. However the verifier should also tell the operator that he needs to implement robust control activities to prevent data gaps from occurring.

Obviously the internal controls (e.g. internal review of data, manual controls etc.) are not effective because the out of validity calibration gas was not spotted.

If there is a data gap, the verifier should also direct the operator to develop a method for determining surrogate data and completing the data gap and have this approved by the CA (please see the steps in the diagram).

**Additional question 2.2c as asked in scenario 2**

*What impact might this have on the declared emissions and the conclusion of the verifier?*

The verifier should check whether determining the emissions with the online gas analysers that is technically out of calibration due to the invalidity of the self-calibration gas has caused a material misstatement or even a limitation of scope. This will depend on whether there is a data gap, the duration of the data gap and whether the verifier has sufficient information available to make a statement with reasonable assurance that the report is free from material misstatements.

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20Calibration gases are only valid for a set period and if used outside their validity date this could mean that the instrument is technically invalid and therefore the data could be invalid.
When assessing the materiality, the verifier will have to take into account the size and nature of misstatements as well as their particular circumstances of occurrence. The verifier will then consider several factors (e.g. whether the misstatement, non-compliance can be corrected, whether the operator refuses to correct, likelihood of reoccurrence, duration, whether misstatement or non-compliance is the result of an act with or without intent, whether there is non-compliance with the MRR. Of particular importance in this case is the fact that the data gap concerns a major source stream. Thus the impact on the reported data, especially if the calibration gas is out of validity for a long time, can be large. See FAQ on classification and reporting outstanding issues in the verification report.
III.3 Model answers for Scenario 3, i.e. instructions to trainers

Power Generation is attached to a Refinery, which itself is part of a larger petrochemicals complex being reconfigured into separate legal entities.

Please note as a general remark relevant for Scenario 3 and subsequent questions, that there are limits of the verifier’s role under Article 17(4) and 27(3) (o) AVR. Wider points covered in these questions are put forward to provoke discussions between participants. Please also note that there is a fine line between providing consultancy and verification. The verifier should refrain from consultancy during the verification as this is a conflict of interest.

For Scenario 3 and the questions listed below, please consider the following configuration of the industrial site and the various plants being part of that complex.

**Situation 3.0**

What additional questions or information would we expect participants to raise in the discussion for the specific questions listed in this Scenario 3?

**Question 3a in Scenario 3**

*What questions should a verifier ask itself to determine the depth and scope of verification for this year? What elements are important given the information in the context?*

A verifier confronted with this scenario should ask itself the following questions;

- How do the organisational changes affect the GHG Permit and the MP?
- How many operators and ETS installations can be distinguished and are listed in the permit(s) and the MP(s)?
- Am I the only verifier commissioned for the whole site (what is the scope of verification relevant to me)?

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21 Useful documents for preparing answers to the questions:

• Do the source streams and emission sources as laid down in the approved MP reflect the actual situation, in particular regarding the changes that have occurred in source streams and emission sources over the year?
• Has there been an increase in the inherent and control risks given the changes in operations?
• Do the monitoring methodology, control activities, and the procedures still reflect the (initial) approved MP?
• Am I accredited for the scope of accreditation that is applicable in this case (scope of accreditation 8: Production of bulk organic chemicals)?
• What impact does the change have upon the category of the installations?

Other elements to take into account:
• The requirement to deliver a verification opinion with reasonable assurance
• Materiality level(s) for Chem-X and Chem-Y

Question 3b in Scenario 3
What information is missing from the context to determine the depth and scope of verification sufficiently?

The verifier should look for the following additional information
• Information from the permit and MP to clarify whether this is a single installation or multiple installations or operators at the site
• Information on organisational changes (e.g. information on operator management, contracts)
• Information on robustness of control activities and procedures

Question 3c in Scenario 3
What questions should the verifier ask itself when considering the impact of the organisational and operational changes on the permit and the monitoring plan?

The verifier should consider and assess the following issues
• What are the installation boundaries (is/was there one installation or multiple installations, is one operator responsible or multiple operators). Are the installations all under the scope of the ETS Directive?
• Has the permit for Chem-X been changed to exclude the refinery activities that have ceased to operate? Chem-X is still operating as production plant.
• Is there a split of the installations or a merger as explained in Guidance Document 10 in the EU ETS Free Allocation guidance series
• Are the installations technically connected? If yes, how?
• Have there been changes in the activity level?
• Have all changes to the capacity, activity level and operations been notified to the CA within the required deadline?
• What changes are there compared to the approved MP and have they been notified to the CA?
• Is Utility A a separate installation and should this installation have a permit?
• Does the verifier still have sufficient competence in the team and as individuals to perform the verification, does it still fall under the scope of accreditation? Should the verifier be accredited for scope 98 in relation to activities carried out under Article 17(4) and 27(3) (o) AVR?

Question 3d in Scenario 3
What types of changes do you distinguish that need to be submitted to the CA by the various operators?
• Permit changes (how many installations/MP/ verification contracts?)
Changes to the MP (significant changes in accordance with Article 15 MRR). This consists of the transfer of the auxiliary equipment and utilities for the production of heat of Chem-X and Chem-Y into Utility A and the transfer of the extraction unit for Butadiene (EB) to Chem-Y, and a change in operation (transfer heat to Chem-X and Chem-Y).

- New entrant (Utility A) (see Article 3h ETS Directive)
- Closure of the refinery part of Chem-X/ planned decommissioning of B103 (impact on allocations)
- Ownership of allocations
- Change of capacity and operations of installation

Question 3e in Scenario 3
What notifications to the competent authority are required by the operator(s) and when??
The transfer of emission sources and units are significant changes to the MP which need to be notified to the CA without undue delay and subsequently approved by the CA.

Changes in capacity and operations of installation need to be notified to the CA by 31 December in accordance with Article 24 CIMS. Note the MS might have additional requirements.

Notification of closure of B103 to the CA and cessation of refinery activities

Question 3f in Scenario 3
Given the context in this case, what are the increased risks?
- Competence aspects of the verification team
- Valid GHG permit and MP
- Notifications not performed
- Transfer of knowledge, new resources
- Revised procedures, new inherent and control risks due to changes

Situation 3.1

Question 3.1a concerning situation in Scenario 3.1
What information does the verifier need to verify and to what extent?
Art. 17(4) AVR: Where operators are required, pursuant to Article12(3) of Regulation (EU) No 601/2012, to include further elements in the monitoring plan that are relevant for meeting the requirements of Article 24(1) of Commission Decision 2011/278/EU (1), the verifier shall check the correct application and implementation of the procedures referred to in Article 12(3) of that Regulation.

In doing so, the verifier shall also check whether information on any planned or actual changes to the capacity, activity level and operation of an installation have been submitted by the operator to the competent authority by 31 December of the reporting period.

In this case the MS has implemented legislation that requires the operator to include further elements in the MP. It concerns a procedure ensuring that changes to the capacity, activity level and operations of an installation are reported to the CA by the 31st of December. The verifier will check whether the procedure:
- is present and properly documented and retained;
- matches the information listed in the summary of the procedures in the approved MP;
- has been correctly implemented and is up to date;
- is applied throughout the year (e.g. whether the operators regularly checks changes to the capacity, activity levels and operation of an installation according to the frequencies mentioned in the procedure);
- is effective to ensure that operators regularly check if information regarding any planned or effective changes to the capacity, activity levels and operation of an installation is relevant and
whether that information is submitted to the CA in time (e.g. checking the frequency with which the operator must check the information, how the operator must check and gather the information required to report to the CA etc.).

The verifier will also assess the changes to the capacity and operations of the installation: e.g. checking whether it reflects the actual situation, checking the communication with the CA, checking the capacity of and activity levels of the production unit, checking the decreases in production of emissions, performing cross checks between production and emission data, observing physical changes observed during the site tour (versus the last visit); carrying out interviews with relevant personnel to support the conclusion.

The verifier needs to ask the operator for confirmation (communication with the CA/MS) concerning the NIMS application and/or final (verified) NIMs application with respect to allocation (i.e. capacity and activity levels that formed the basis for the allocation – these are indicated in section_K_summary NIMS application template developed by the Commission).

GD2 (within the Free Allocation guidance series), p 34: Physical changes must be understood as modification of production processes and the equipment required, and the different subparts of the definition should be interpreted as:

1. The necessary condition is the physical nature of the change related to the technical configuration and functioning. This excludes merely organisational or operational changes (e.g. longer daily operation hours, higher speed of rotating kiln, application of new process control software, change in process parameters such as pressure, temperature).

2. The impact of the physical change on the technical configuration and functioning constitutes the sufficient condition. Any physical change without such impact (e.g. repaint of coating of outer face of a kiln) does not match the definition as there needs to be clear causality link between the physical change(s) and the change in capacity. In other words, only physical changes allowing for changes in throughputs could lead to significant changes in capacity.

3. Furthermore, the mere replacement of an existing production line cannot be considered in the context of the definition of significant capacity extensions. This includes the replacement of parts of the production line without impacts on the technical configuration and function (e.g. replacement of a pre-heater with the same performance). But, in case of higher maximum throughput of the production line after the replacement, this change could in principle constitute a physical change leading a significant capacity extension (provided the quantitative criteria have been met).

Physical changes exclusively aiming at improving the energy efficiency of a sub-installation or the improvement or installation of an end of pipe abatement technology to reduce process emissions should not be regarded as a physical change leading to a significant capacity reduction.

Please note that, although 31 December is indicated in Art. 17(4) and 27(o) AVR, an MS may have implemented stricter timelines for notifying the CA in case of significant capacity reductions and cessations.

**Question 3.1b concerning situation in Scenario 3.1**

**Is the change to capacity significant as mentioned in Commission Decision 2011/278?**

The initial installed capacity and activity level within the heat-benchmark is 985 TJ per year. Due to the installation of the heat exchanger 120 TJ of heat is used less whilst the production remains unchanged. As a consequence, the heat import decreased to 880 TJ. As such, the net heat consumption within the heat-benchmark decreased to 865 TJ. As the production of PE remains unchanged, the energy performance of the production unit has increased.
As the heat demand has decreased after the installation of the heat exchanger (a capacity change of more than 10%)\(^{22}\) and the capacity change has occurred as a result of a physical change, it seems to meet the definition of a significant capacity change as laid down in Article 3(i) (j) (k) of the CIMS Decision.

However, the physical change is solely focussed upon improvement in energy efficiency while the activity level remains at 985 TJ.

GD2 on the harmonised free allocation methodology, p35 states: “Physical changes exclusively aiming at improving the energy efficiency of a sub-installation or the improvement or installation of an end of pipe abatement technology to reduce process emissions should not be regarded as a physical change leading to a significant capacity reduction – GD2 on harmonised free allocation methodology, p35”.

Therefore, in this Scenario 3.1 there is no significant change to the capacity.

**Question 3.1c concerning the situation in Scenario 3.1**

**What is the impact on the verification report?**

There is no significant capacity change as the physical change is exclusively aimed at improving energy efficiency. Art. 27(3) (o) AVR states: “where the verifier has observed changes to the capacity, activity level and operation of the installation, which might have an impact on the installation’s allocation of emission allowances and which have not been reported to the competent authority by 31 December of the reporting period in accordance with Article 24(1) of Decision 2011/278/EU, a description of those changes and related remarks.

Therefore, the verifier should report the changes to the MP in the verification report if these are not notified to the CA (see the box: Changes etc. identified and not reported to the Competent Authority/included in updated MP in the verification opinion statement).

As there is no significant change to the capacity and there is no likely impact on the installation’s allocation of emission allowances, the verifier does not have to report this under Article 27(3) (o) AVR unless the verifier thinks that he should report it to the CA to draw the CA’s attention to the capacity changes.

**Situation 3.2**

**Question 3.2a concerning the situation in Scenario 3.2**

**What information does the verifier need to verify and to what extent?**

See 3.1a above.

**Question 3.2b concerning the situation in Scenario 3.2**

**Is the change to capacity significant as mentioned in Commission Decision 2011/278?**

The installation still consumes 200 TJ, however the quantity of ETS heat import has reduced to 80 TJ. This means that the activity level is reduced by more than 50% compared to the activity level used for calculating the sub-installation’s allocation. This constitutes a partial cessation in line with Article 23 CIMS. Hence the allocations will be reduced (partial cessation). Notification to the CA is required.

**Question 3.2c concerning the situation in Scenario 3.2**

**What is the impact on the verification report?**

The initial activity level on which the allocation has been based has been reduced by more than 50%.

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\(^{22}\) Page 34 of Guidance Document 2 on the free allocation of emission allowances. One of the criteria of a significant decrease of capacity is:

1) one or more identifiable physical changes relating to its technical configuration and functioning other than the mere replacement of an existing production line have taken place, and

2) the sub-installation can be operated at a capacity that is at least 10% lower compared to the initial installed capacity of the sub-installation before the change
The operator has not notified the changes to the competent authority, hence the operator’s procedures pursuant to Art.12 (3) MRR were ineffective (non-conformity/compliance with the MRR). In accordance with article 27 (3) (o) AVR, the verifier needs to include a description of the changes and related remarks in the verification report.

**Situation 3.3**

*Question 3.3a concerning the situation in Scenario 3.3.*

**What type of change has occurred that needs to be reported to the CA?**

Partial cessation. The activity level has decreased by 58%. Hence a correction of allocated allowances for next reporting period will be applied. This should be reported to the CA in accordance with Article 24 CIMS.

*Question 3.3b concerning the situation in Scenario 3.3.*

**What information does the verifier need to verify and to what extent?**

See 3.2a.

In this case the MS has required operators to include further elements in the MP. It concerns a procedure ensuring that changes to the capacity, activity level and operations of an installation are reported to the CA by the 31st of December. The verifier will check whether the procedure:

- is present and properly documented and retained;
- contains the information listed in the summary of the procedures in the approved MP;
- has been correctly implemented and is up to date;
- is applied throughout the year (e.g. whether the operators regularly checks changes to the capacity, activity levels and operation of an installation according to the frequencies mentioned in the procedure);
- is effective to ensure that operators regularly check if information regarding any planned or effective changes to the capacity, activity levels and operation of an installation is relevant and whether that information is submitted to the CA in time (e.g. checking the frequency with which the operator must check the information, how the operator must check and gather the information required to report to the CA etc.).

The operator indicates that economic circumstances are the reason for a lower heat consumption/production. The verifier will also check the following:

- Is reduction seen within activity data/emissions? The verifier cross checks if the reduction in heat production is reflected in reduced fuel consumption, i.e. activity data. The verifier checks whether there is a change in source streams or impact on categorisation of the installation.
- Does the MP still reflect the actual situation?
- Evidence that the change was notified to the CA within the time required.
IV. Findings from the nine Discussion Groups

Plenary feedback from the Group Discussion Sessions I to IV and final Q&A

Presented and explained by the trainers of the nine Discussion Groups

A&V Training Event, 14/15 September 2016
Feedback & Conclusions from DG-1

**Scenario 1**

- Checking installations boundaries, completeness and relevance of source streams and sources is important; permit and MP are key resources of information
- Checking data flow and control environment (complexity of data, human factor vs automatic measurement etc.)
- Risk analysis basis for determining scope of verification sampling for each source stream and the verification as a whole ➔ scope verification plan is based on risk analysis
- Assessment of inherent and control risk = probability x impact

**Scenario 2**

- Increased complexity in installation boundaries, data flow and control activities, spreadsheets and databases, increased inherent risks, require additional checks
- Classification of emission source streams as major, minor and de-minimis
- Distinction between data gaps and notification to CA in case of temporary deviation from MP
- Data gaps need to be closed by conservative methodology approved by the CA
- Important to assess why data gap occurred

**Scenario 3**

- Important new issues requiring e.g. new MP, new permit, identifying new materiality issues, new tiers etc.
- Discussion on chicken and egg problem: getting the contract without accreditation is difficult, but witness of verifier at installation site is required to get accreditation
- Operator needs to have a procedure to check whether there have been changes to capacity, whether these are significant and have been notified to the CA. Verifier checks whether procedure has been implemented and followed
Feedback & Conclusions from DG-2

Scenario 1

- Establishing installation boundaries and completeness of source streams difficult with de-minimis source streams
- Difficulty in understanding the materiality and the assessment of inherent and control risks, risk analysis determines the depth of verification plan/sampling plan
- Distinction between the responsibilities of the Competent Authority and the verifier/communication between stakeholders
- Additional complexity because of use of bioliquids and mixes and compliance with sustainability criteria

Scenario 2

- Increase of inherent and control risks influencing depth of verification and sampling size
- Added complexity on installation boundaries (one or multiple operators, installations)
- Drawing a data flow diagram helps to follow the data flow activities and classification of source streams
- You must have good knowledge of refineries to have an understanding of critical points
- Distinction between temporary change to the MP and data gaps

Scenario 3

- Number of legal entities increased after the change which should result in the issuance of (new) permits and MP update
- Consequences for the audits, the scope and number of contracts for the verification before and after the changes
- Changes have impact on the notifications to the CA, materiality aspects and the risks involved with the changes in regard to meters, source streams, boundaries, competencies of the operator, control procedures and timeliness of notifications
- Scenarios 3.1 to 3.3 concern issues of updating the permit, the MP and procedures, (partial) cessations and notifications
Feedback & Conclusions from DG-3

Scenario 1

- Site visit is very important!! Situation requires thorough check of completeness of emission sources, source streams and procedures in approved MP
- Operator’s risk assessment is crucial for the CA and operator to carefully think through the processes in the installation and avoid data gaps
- For reasonable assurance and thorough site visit, it is crucial to have a really thorough and detailed preparation
- Human factors are difficult to discover and it has to be considered when preparing a testing and sampling plan
- Time could be saved if there were more communication/ workshops/trainings between different parties

Scenario 2

- There are still different opinions whether in some cases de-minimis source streams could be neglected.
- Key is understanding the installation’s processes and whether the data flow and management are complicated or straightforward
- Sometimes dealing with minor or de-minimis source streams is more time consuming than checking the major source streams activity data.
- There was a discussion within the group on the distinction between a temporary change to the MP (Art 23 MRR) and a data gap. Assessment of material impact on data depends on quantitative and qualitative factors

Scenario 3

- Each situation needs careful study on a case by case basis and information about the restructuring, changes in capacity etc.
- Difference between ETS and non-ETS heat suppliers needs to be considered when determining new activity levels and deciding whether it is a significant capacity change or not.
- A capacity change due to improving energy efficiency should not be regarded as physical change leading to a significant capacity reduction.
- Notification of the changes to CA is needed and verifier may have to go back through several prior year’s data to identify relevant changes, understand the changes and check whether all relevant notifications are done accordingly
Feedback & Conclusions from DG-4

**Scenario 1**

- Establishing installation boundaries and completeness of source streams - difficult with de-minimis source streams
- Basic information from MP, permit, supporting documents needed to address issues, but some disagreement on responsibility (CA and/or verifier) to check supporting documents referenced in MP but not provided to the CA.
- Risk of materiality for minor streams is low and high for major source streams. If a source stream is missing from the MP this could lead to misstatement if it leads to errors in the data. Minor errors if aggregated may exceed materiality threshold
- Relevant issues: Inherent and control risks – control documents / procedures - laboratory accreditation – are the specified analyses in scope; liquid fuels – are deliveries complete and aligned with measurement gauges; supplies of fuel – type, frequency and different means of supply can introduce errors.

**Scenario 2**

- Additional accreditation scope and competence requirements
- Permit issues: have installations two permits or just included in one permit – who is the actual operator?
- Main inherent risks are automatic transfer of data to PI, HFO consumption, wrong calculations, different data sources etc.
- Main control risks are lack of calibration and maintenance, lack of lab accreditation, number of people involved in data management etc.
- If there are 2 permits, there should be 2 verifications
- Important questions: Is internal lab accredited, is use of online analysers approved, is list of instruments complete, what about uncertainty of each metering system?

**Scenario 3**

- Questions on scope and depth of verification, permit situation, boundaries, emission sources and sources streams, materiality level. Is information missing?
- Two types of notifications to CA, i.e. allocation and MP related.
- Relevant questions: what changes impact organisation and operation raising issues of validity of permit and MP? Was change communicated to CA? Was approval granted? What are the increased risks? What are the changes in activity level?
- What information is to be checked by the verifier? Has operator notified CA? When is a change significant. A change improving the energy efficiency is not a physical change leading to a significant capacity reduction -> verifier does not have to report this
Feedback & Conclusions from DG-5

Scenario 1

- Perspective on materiality by the verifier or the CA could be different – remains a difficult issue
- Risk analysis is always changing based on findings during the verification
- Discussion on whether very small de-minimis sources such as welding gasses, perhaps even lubricants etc. should be reported and their emissions verified
- Checks are always needed of correct boundary and changes
- Sustainability aspects/criteria of bio fuels; EF=zero or not? How to check?

Scenario 2

- Legislation may differ per country regarding whether there is always 1 permit per installation, or that one permit can contain multiple installations
- Difference between temporary changes vs. data gaps (when/how to use Art. 23 MRR and tier issues)
- CEMS – quality control often an issue (the CEMS in scenario 2 not likely complying with legislation – EN 14181)
- Competency check’s by speaking to people – not just follow a paper trail -> professional skepticism is needed, site tour important, also to speak to people in the installation

Scenario 3

- Discussion on what is defined as a physical change
- Allocation checks can be quite difficult, how far/deep do you go with your verification checks (check plausibility vs. recalculating activity levels)
- Difference in accreditation for scope 98 (would be required for CIMS verification) and verification of AER (Art 17(4) and 27(3) (o) AVR)
- There is an additional risk for verification, because verifiers may not be verifying allocation changes, so it is/may be more difficult for them to assess issues relating to allocation changes
- In some countries it is also required for a installation to report yearly on their activity levels
Feedback & Conclusions from DG-6

**Scenario 1**

- Important for the verifier to get the information needed from the operator (see Art. 10 AVR) and his communication with CA
- Main inherent risks: missing/ not representative samples; failure of metering devices for fuel tanks and day tank; missing delivery notes
- Main control risks: missing calibration and/or maintenance of metering devices, insufficient competency of personnel (sample taking, meter maintenance), use of non-accredited (or equally qualified) laboratory
- Verification to focus on HFO (in this case). Are alternative fuels included in approved MP or notified to CA, and do alternative fuels meet the required sustainability?

**Scenario 2**

- Inherent and control risks on larger and more complex scale; data flow to PI is much more complex than in scenario 1
- A review of the MP(s) and the approval(s) should show whether there are multiple installations on the site or just one
- Due to complexity of the operation, site visit needs good preparation and a well-organized agenda. IT-department should be part of agenda to address data flow and PI
- Data gaps difficult to determine – depends on reproducibility of data
- Control system hadn’t detected the faulty meter. Verifier should check if there are other meters not working properly and whether the operator has improved its control-system

**Scenario 3**

- Accreditation for scope 98 appropriate for a full CIMS verification but unnecessarily onerous regarding AER verifications and dealing with capacity changes only to the extent of AVR Article 17(4 and 27(3)(o).
- Verifier must be sure that the changed situation is correctly reflected in permits and MPs and that all changes are notified to and approved by CA.
- Due to recent reorganization, control system may not function well and procedures may not be followed. Verifier should check these during site visit, e.g. by preparatory site visit
- Physical changes (exchanger) should be notified to CA, although higher energy efficiency has no impact on allocation
- Verifier should mention in VR that procedure on notification had not worked properly
Feedback & Conclusions from DG-7

Scenario 1

• Discussion on portable but not mobile emitting elements within a site: sometimes these emergency power generators emit 1-5 tonnes of CO2 and materiality is not at stake

• For sampling, different rules and principles are used throughout their verification practices. Participants use different techniques

• What should be communicated to the competent authority regarding the usage of bioliquids? If a source stream is altered/added, i.e. a bioliquid, this should be altered in the MP, notified to and approved by the CA

Scenario 2

• When operators of plants are different persons with regard to H&S and economic decision making, then two permits, two MPs and two emission reports are to be expected. If these responsibilities are supervised by one person (or team) one permit is expected.

• There is an area of risk in RFG (when mixed with process gases in VBU Unit). Sampling takes places twice a day and is put into LIMS and subsequently put into PI. The way this is done may impose some risks

• Participants had difficulty in determining whether the error with the reported emissions of the VBU is a temporary change of the MP or a data gap

Scenario 3

• No allocation for heat transfer from non EU ETS

• Physical changes exclusively aiming at improving the energy efficiency does not constitute a physical change leading to a significant reduction of capacity. No reporting by the verifier required under Article 27(3)(o) AVR

• Need to understand the boundaries of the new installations/operators
Feedback & Conclusions from DG-8

**Scenario 1**
- Desk Review based on MP (source streams, portable units), operator’s notifications, materiality issues and operator’s procedures and control activities
- Production of 1st Risk Analysis based on desk review
- On-Site audit involves: What we are looking for? Is MP reflective of the site? If necessary, check that everything has been updated in line with permit conditions. Assessment based on results concluded from previous verification, internal audits other schemas (i.e. ISO, EMAS)
- Changes impact risk analysis, scope of verification, notifications to CA, staff competence, calibrations and metering

**Scenario 2**
- Evaluate verifier’s technical competence wrt to technical requirements of facility.
- Extra sources / plant requires amendments to desk review and risk analysis, extra evaluation of operators amended procedures
- Focus verification activity on main sources/ source streams

**DATA GAPS:**
- Evaluate their scope and impact; are they data gaps or not?
- Accounting before and after: can we use historical records for surrogate data?
- How is operator dealing with this situation? Are procedures, particularly control procedures, being updated?
- Has a non-compliance and issue and are recommendations needed?

**Scenario 3.0**
- Verifier’s accreditation scope & Technical competence
- Installation boundaries - Permit & MP - How many installations?
- Notifications of these changes? - Operator’s procedures & System Control
- CA’s evidence (notification of changes within deadline, resolution)?

**Scenario 3.1**
- Physical change assessment: description, scope & impact
- Categorization of change: significant? - Compliance with CA notifications & Operator’s docs?

**Scenario 3.2**
- Physical change assessment: description, scope & impact? Is the categorization of change significant? Is there compliance with CA notifications & Operator’s docs?

**Scenario 3.3**
- Partial cessation as site reduced activity to below 50% of the HAL
- Formal notification to CA and evidence, and within deadline?
- Physical change assessment: description, scope & impact: does this affect the site’s allocation? Does the change affect the categories of the site/ source streams?
- Interesting to note that some CAs require that partial cessation notifications need verification whereas other CAs do not.
Feedback & Conclusions from DG-9

**Scenario 1**

- Is MP/Permit up to date or are there changes to take account of?
- Is MP complete with all sources and source streams included?
- Is the lab accredited or not?
- Uncertainty vs Error vs Materiality (note the difference between them – equipment, human, technique/tool)
- Is complete accounting process and full universe of data understood before test & sampling plan is developed?
- Challenges of proving sustainability if the fuel doesn’t have a certificate from an approved scheme

**Scenario 2**

- Need to understand both physical organisation/structure and company management structure in order to decide how many installations (& permits/MPs) the location should have
- Local legislation may dictate things that make it easier for the auditor e.g. in Hungary flares must have meters
- Importance of information feedback loops to make sure information from e.g. meter failures gets from instrument team to GHG data co-ordinator

**Scenario 3**

- Understanding context of any changes in physical, organisational, ownership and sub-contract/outsourcing
- Linked to this are potential changes in accounting systems e.g. a common accounting system across multiple installations which could create efficiencies in an audit visit even if there were separate verification reports
- Or if there is a split of an installation into new ones, are there increased risks associated with split or new accounting systems?
- Decisions to change were made in March, but not clear when changes actually occurred; could be after the relevant reporting year so would have no impact on current verification
VI. Findings from the plenary Q&A

Concluding remarks and lessons from the training

Rob Gemmill

A&V Training Event, 14/15 September 2016
Major points drawn from this morning’s feedback (1)

- Need to be clear regarding MRR Article 23 (temporary changes) and MRR Article 65 (treatment of data gaps)
  - Art 23: evident from operator notification to CA
  - Art 65: conservative treatment of residual data gaps
- Need to be clear regarding online gas analysers (Art 32(2) MRR) and CEMS (Art 42)
  - Different QA requirements

Major points drawn from this morning’s feedback (2)

- Big differences between annual emission verification and CIMS verification
- Scope 98 requirement
  - Not for annual emissions verification
  - Nonetheless AER verifier should have some understanding of the capacity implications (definitely in relation to AVR Art. 17(4) and Art. 27(3)(o), and MRR Art. 12(3)
- Site Visit – very important
- Risk analysis changes
- CAs, verifiers and NABs learn so much from working together!!!
### Annex I: Programme of the 2016 EU ETS Compliance Forum

**Event : Day I of the A&V Training on Verification Issues**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00 - 10:15</td>
<td>Opening, welcome, agenda and objectives of the training event</td>
<td>Chair</td>
</tr>
<tr>
<td>10:15 - 10:30</td>
<td>Introduction of the base case study (Scenario I) and the issues for discussion in Session I: Scope of verification, verifier sampling, materiality and reasonable assurance judgements</td>
<td>Machtelt Oudenes</td>
</tr>
<tr>
<td>10:30 - 12:30</td>
<td>Session I Group Discussion on the base case study (addressing the least complex situation)</td>
<td>Participants</td>
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<tr>
<td>12:30 - 14:00</td>
<td>Lunch</td>
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<tr>
<td>14:00 - 14:05</td>
<td>Opening of the afternoon training</td>
<td>Chair</td>
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<tr>
<td>14:05 - 14:30</td>
<td>Introduction of further complexity to the base case study (Scenario II and related questions)</td>
<td>Machtelt Oudenes</td>
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<tr>
<td>14:30 - 15:30</td>
<td>Session II Group Discussion of issues and related questions on the added complexity of Scenario II</td>
<td>Participants</td>
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<tr>
<td>15:30 - 15:45</td>
<td>Tea break</td>
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<tr>
<td>15:45 - 16:00</td>
<td>Introduction of data gaps in Scenario II and related questions</td>
<td>Machtelt Oudenes</td>
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<tr>
<td>16:00 - 17:00</td>
<td>Session III Group Discussion on the data gap issues related to Scenario II</td>
<td>Participants</td>
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<tr>
<td>17:00 - 17:15</td>
<td>Final remarks and close of the Day I training</td>
<td>Chair</td>
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### Day II of the A&V Training on Verification Issues – Day II

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Who</th>
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</thead>
<tbody>
<tr>
<td>09:00 - 09:10</td>
<td>Opening and introduction of the agenda and objectives of Day II</td>
<td>Chair</td>
</tr>
<tr>
<td>09:10 - 09:30</td>
<td>Introduction of Scenario III with issues concerning capacity changes, activity levels and changes in operation of the installations and the role of the verifier (addressing specific questions in the case study)</td>
<td>Machtelt Oudenes</td>
</tr>
<tr>
<td>09:30 - 11:00</td>
<td>Session IV Group Discussion on the issues of Scenario III: capacity changes, activity levels and operational changes</td>
<td>Participants</td>
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<tr>
<td>11:00 - 11:30</td>
<td>Coffee break</td>
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<tr>
<td>11:30 - 12:30</td>
<td>Plenary feedback from the Group Discussion Sessions I to IV and final Q&amp;A</td>
<td>Chair Trainers</td>
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<td></td>
<td></td>
<td>Participants</td>
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<tr>
<td>12:30 - 14:00</td>
<td>Lunch</td>
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<tr>
<td>14:00 - 15:00</td>
<td>Presentation of materiality of misstatements followed by plenary discussion</td>
<td>Machtelt Oudenes</td>
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<td></td>
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<td>Participants</td>
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<tr>
<td>15:00 - 15:15</td>
<td>Tea break</td>
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<tr>
<td>15:15 - 15:45</td>
<td>Concluding discussion and lessons from the training</td>
<td>All</td>
</tr>
<tr>
<td>15:45 - 16:00</td>
<td>Final remarks and close of the Day/Event</td>
<td>Chair</td>
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Annex II: Introductory presentations to explain Objectives and Aims of the Accreditation and Verification Training
Training aims to increase harmonised understanding on:

- Verifier's sampling and scope of verification; materiality and reasonable assurance judgments
- Resolutions in connection with Article 23 MRR (notification of temporary changes to the MP) and Article 65 MRR (data gaps)
- Changes in the capacity, activity levels and operation of an installation (Article 17(4) and 27(3) (o) AVR)

Set-up of the training

- 9 discussion groups, each with one trainer – you have been notified in which group you are
- Each discussion group has been “balanced” concerning verifiers, NABs and CA representatives from Member States
- Main sessions will be introduced by a short plenary presentations highlighting the issues to be followed in the discussion groups
- Main sessions are based on three scenarios prepared to cover verification issues related to the three main topics
- Scenarios will gradually evolve in complexity during the training event
Set-up training for sessions

- Group trainers will provide further instruction and moderate the discussion in your group – they will also answer specific questions on the case studies
- Everyone should participate actively in discussions, because this training is about learning by doing and mutual exchanges
- One person in the group should take notes for the feedback
- Each session will be closed by the group trainer drawing conclusions on behalf of the group
- During the breaks the organiser will gather conclusions and main discussion points of each group
- In the plenary session of Day II feedback will be shared on the discussions and conclusions from the discussion groups

Other issues

- Discussion Group 7 is in room 3-04, other Discussion Groups will remain in this room
- After the training event, the training documentation will be updated for cascading further in your organisation/MS
- Training documentation will contain all scenarios including the model answers and explanations
- Training material will be sent to all participants and published on the Commission’s Website:
  http://ec.europa.eu/clima/policies/ets/monitoring/documentation_en.htm
Scenario 1: Scope of verification, verifier sampling, materiality and reasonable assurance judgements

Machtelt Oudenes, SQ Consult

A&V Training Event, 14/15 September 2016

Base case scenario 1

- **Heavy Fuel Oil-Fired Power station generating electricity**
- **Combustion installation emitting 285,300 tonnes CO₂ per year**

- Consumption of all fuels based on stock balance using data from deliveries and measured tank level changes
- Analysis composition data and NCV for HFO by external lab
- Standard factors for the EF for Gas Oil and Propane based on national inventory factors
Questions under Scenario 1

- Concern the following issues
  - Verifier’s scope and depth of verification
  - Connection with the verifier’s risk analysis
  - Role of materiality in the planning of verification
  - Verifier’s sampling
  - Reasonable assurance judgments

- Relevant Articles in the AVR: Articles 7, 10, 12 and 13

- Relevant guidance includes EGD I, and KGN II.1, II.2, II.3, II.4 as well as relevant MR guidance documents to understand M&R specific issues

Questions under Scenario 1.1

- Base case from scenario I made more complex under 1.1
  - Test-fire of alternative fuels (rape seed oil, tall oil, cashew nut oil and reclaimed oil)
  - How to deal with changes to the MP
  - Implications/complications for the verifier if the operator uses bioliquids

- AVR and Commission Guidance to be followed when answering questions

- For each question: ask yourself whether the verifier has the information needed to answer the question or whether additional information or checks are needed
Scenario 2: 
*Increased installation capacity*

**Scenario 2.1: Resolutions in connection with Article 23 MRR and Article 65 MRR**

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**Scenario 2 – increased complexity**

- *HFO fired power installation in scenario 1 is part of an industrial complex that includes a refinery*
- *Refinery produces around 2,409,670 tonnes CO₂ per year*
- *Figure shows installation boundaries, the units and how activities are connected*
- *Different source streams and their sizes are mentioned*
- *Monitoring methodology for power installation as described in scenario 1 and for refinery as described in scenario 2*
Questions under Scenario 2

• More complex situation in scenario 2 has implications for:
  • Verifier’s competences
  • Verifier’s scope and depth of verification
  • Verifier’s risk analysis and checks to be carried out
  • Identification of source streams/installation boundaries
  • Verifier’s sampling
  • Reasonable assurance judgments
• Relevant Articles in the AVR include Art. 7, 10, 12, 13, 20

• Relevant guidance includes EGD I, KGN II.1, II.2, II.3, II.4, II.7 and relevant MR guidance documents to understand M&R specific issues

Questions under Scenario 2.1

• Meter not functioning properly since shut-down:
  • Effect on declared emissions
  • Impact on scope and detail of verification
  • Is this a data gap or a temporary change to MP?
  • What are the checks to be carried out?
• Relevant Articles in AVR include Art. 7, 10, 12, 13, 18, 20
• Relevant Articles in the MRR include Article 23 and 65 MRR
• Relevant guidance includes EGD I, KGN II.1, II.2, II.3, II.4 and relevant MR guidance documents to understand M&R specific issues
Questions under Scenario 2.2

• Calibration gas bottle for one gas analyser is out of date
  • Is this a data gap?
  • What recommendations would you make? How to classify?
  • What is the impact on declared emissions?

• Relevant Articles in the AVR include Art. 7, 10, 12, 13, 20, 27

• Relevant Articles in the MRR include Article 23 and 65 MRR

• Relevant AV guidance includes EGD I, KGN II.1, II.2, II.3, II.4 and further relevant MR guidance documents to understand M&R specific issues
Scenario 3: 
*Further increase of installation complexity*

**Scenario 3.1 – 3.2 – 3.3**

*Changes in the capacity, activity levels and operation of an installation (Article 17(4) and 27(3) (o) AVR)*

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**Scenario 3 – further complexity**

- *HFO fired power installation and refinery are part of a petrochemical complex – changes in organisation/operation*

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**Petrochemical complex (before change)**

- Refin
- Chem-X
  - Steam Cracking
  - EB unit
- Chem-Y
  - PE
  - PP
- Power Plant

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**Petrochemical complex (after)**

- Utility-A
  - Steam Cracking
- Chem-X
  - PE
  - PP
  - EB unit
- Chem-Y
  - PE
  - PP
  - EB unit
- Power Plant

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Heat transfer

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Questions under Scenario 3

• Additional complexity in scenario 3 has implications for:
  • Verifier’s scope and depth of verification
  • Verifier’s risk analysis and checks to be carried out
  • How to deal with changes in operation and capacity – what type of changes can be distinguished

• Focus on capacity changes, changes in activity level and operation of the installation – Article 17(4) and 27(3) (0) AVR

• Aim is not to discuss verification of NIMS data. However some wider issues than Art.17(4) and 27 AVR can come up to discuss the role of the verifier versus the role of the CA

• Relevant guidance includes EGD I, KGN II.1, II.2, II.3

Scenario 3.1: separate case

• Project within an installation to enhance the energy efficiency of one of the production units
**Scenario 3.2: separate case**

- Project to import heat from non ETS suppliers to production unit thereby reducing heat import from ETS site

**Scenario 3.3: separate case**

- Installation uses various fossil fuels for the production of heat used in the production process
- Decrease in the heat consumption/production because of economic circumstances (decrease to 250 TJ compared to 601 TJ before)
- Heat benchmark for the sub-installation accounts for more than 30% of the total allocation granted
- MS requires the operator to include further elements in the MP in accordance with Article 12 (3) MRR
  - Procedure to ensure capacity changes, changes in activity level and operation are notified to the CA in accordance with Article 24 CIMS by 31 December