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Guidance Document

The Accreditation and Verification Regulation - Verifier's risk analysis

AVR Key guidance note no. II.2, Version of 12 July 2012

This document is part of a series of documents and templates provided by the Commission services for supporting the interpretation of Commission Regulation (EU) No. 600/2012 of 21 June 2012 on the verification of greenhouse gas emission reports and tonne-kilometre reports and the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council.

The guidance represents the views of the Commission services at the time of publication. It is not legally binding.

This guidance document takes into account the discussions within meetings of the informal Technical Working Group on the Accreditation and Verification Regulation under the WGIII of the Climate Change Committee (CCC), as well as written comments received from stakeholders and experts from Member States. This guidance document was unanimously endorsed by the representatives of the Member States at the meeting of the Climate Change Committee on 11 July 2012.

All guidance documents and templates can be downloaded from the documentation section of the Commission's website at the following address:

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

Background

This key guidance note is part of a suite of guidance documents developed by the Commission services to explain the requirements of the EU ETS Regulation on Accreditation and Verification no. 600/2012 (AVR). The suite of guidance documents consists of:

- an explanatory guidance on the articles of the AVR (EGD I), including a user manual providing an overview of the guidance documents and their interrelation with the relevant legislation;
- key guidance notes (KGD II) on specific verification and accreditation issues;
- a specific guidance (GD III) on the verification of aircraft operator's reports;
- templates for the verification report and information exchange requirements;
- exemplars consisting of filled-in templates, checklists or specific examples in the explanatory guidance or key guidance notes;
- frequently asked questions.

The key guidance note explains the requirements on risk analysis in the AVR. The note represents the views of the Commission services at the time of publication. It is not legally binding.

1. Objectives

The EU ETS Directive and Article 12 of the AVR require the verifier to carry out a risk analysis. The objective of the risk analysis is to assess the likelihood of risks of misstatements and/or non-conformities and to assess their likely material impact on the reported data. Its outcome determines how and to what extent the verification activities should be designed, planned and implemented. 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 risk¹ 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. In other words, the verifier's assessment of the inherent risks (IR) and the control risks (CR) determines the nature, timing and extent of verification activities to be performed to reduce the risk that material misstatements are not detected. This detection risk (DR) must therefore be sufficiently low to arrive at a verification risk (VR) that is in accordance with the required assurance level. This risk analysis model can be expressed in the formula: VR = IR x CR x DR. In this model, the different types of risks are interrelated and the management of these risks are part of the overall verification risk management: i.e. the management of the risk that the verifier issues an inappropriate verification opinion.²

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¹ 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.

Example to explain the relationships between the risks and their assessment. The verification risk is generally set at 5%, in accordance with the level of confidence (95%) associated with reasonable assurance. If the inherent risk is high (IR : 100%) and the control risk is also high (CR : 50%), meaning that the internal control activities and procedures are not adequate to manage the risks, the verifier has to apply more stringent and detailed testing, and increase the sample size set to arrive at a sufficiently low detection risk to be able to make a statement with reasonable assurance . In formula DR = VR/ {IR x CR} = 0.05/ {1.0 x 0.5} = 0.1. If within the same example adequate controls are in place (CR:12.5%), the verifier can apply less stringent and detailed testing and a reduced sample size thereby accepting a higher detection risk to reach the same verification risk. In the formula: DR = 0.05 / {1 x 0.125} = 0.40 to reach the same verification risk. The % used in this calculation formula are examples.

This key guidance note explains the activities that the verifier needs to undertake during his risk analysis. The different activities in the risk analysis are closely interlinked. In fact these activities are conducted interdependently and simultaneously. The strategic analysis findings feed into the risk analysis, which in turn feeds into the setting up of the verification plan. The note also explains that risk analysis is an iterative process:



This means that during the actual verification the risk analysis is subject to change and may have to be adapted as a result of later findings.

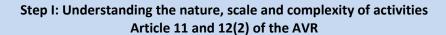
The note applies to the **verification of operators and aircraft operator's reports**. Please note the following:

- Wherever the note uses the term 'report' it means the operator's emission reports and the aircraft operator's emission reports or tonnekilometre reports.
- Wherever the note uses the term 'operator' this also means that the relevant phrase is applicable to aircraft operators unless this is specifically mentioned otherwise in the note.



2. Key Steps to a risk analysis

During the risk analysis the verifier has to undertake the following key steps and activities:





Step II: Identifying and assessing the inherent risks Article 12(1) (a) of the AVR



Step III: Preliminary analysis of control activities to mitigate inherent risks
Article 12(1) (b) of the AVR



Step IV: Identifying and assessing control risks
Article 12(1) (c) of the AVR



Step V: Reducing the verification risk to an acceptable level Article 13(4) of the AVR

Step I: Understanding the nature, scale and complexity of activities

The verifier has to consider the following information to obtain a more complete understanding of the installation or the aircraft operator as input into the risk analysis.

Information to be consider by the verifier	AVR requirement	More guidance	
The findings of the strategic analysis and the	Article 12(1) (a)	Section 3.2.3	
understanding the verifier has gained in that phase		Explanatory	
of the verification		Guidance (EGD I)	
A more in-depth analysis of the information	Article 12(1) (b)	Section 3.2.2	
mentioned in Article 10(1)of the AVR to enable the		Explanatory	
verifier to assess the likelihood of the risk of		Guidance (EGD I)	
misstatements and non-conformities and their likely			
material effect on the reported data;			
The applicable materiality level enabling the verifier	Article 12(1) (c)	Section 3.1.5	
to assess the likely material effect of the risks		Explanatory	
involved on the reported emission data or tonne-		Guidance (EGD I)	
kilometre data.			

When considering the information mentioned in Article 10(1) of the AVR, the verifier will focus on operator specific elements. Examples are:

- the relevance and proportional size of the emissions or tonne-kilometre data related to emission source streams or emission sources. If the number, nature and complexity of the source streams is large, this is likely to increase the risks of misstatements, as will the scale and complexity of the accounting process itself;
- the complexity of the operator's operations;
- the adequacy of data flow activities (including spread sheets, links and automation), data management systems (and their degree of automation), the operator's risk assessment and control activities;
- the approved monitoring plan and the specifics and complexity of the applicable monitoring methodology;
- the completeness, robustness and proper implementation of the procedures mentioned in the approved monitoring plan. This affects the extent to which the verifier can have confidence in the operator's entire control system;
- the report.

If the verifier has carried out previous verifications for the same operator, an analysis of the information above will also include a review of the risk analysis carried out in prior years as well as the prior year findings log for that operator. This includes other information from prior year verifications as far as that is relevant to identifying the risks of material misstatements. Deviations compared to previous verifications should attract particular attention from the verifier. Although the assessment of the information required by the AVR will take less time in a situation where the verifier is already familiar with the operator's data flow, and the data management and control system have been checked during prior verifications, this does not negate the verifier from carrying out a proper risk analysis for the present verification engagement.

Art. 10(1) AVR

Step II: Identifying and assessing inherent risks

The verifier has to identify and analyse the inherent risks, which are defined as follows in the AVR:

Definition inherent risk	AVR requirement
Inherent risk means the susceptibility of a parameter in the operator's or	Article 3(15)
aircraft operator's report to misstatements that could be material,	

Definition inherent risk	AVR requirement
individually or when aggregated with other misstatements, before taking	
into consideration the effect of any related control activities.	

This means that inherent risks are risks linked to the data flow activities³ themselves assuming that there are no related control activities to mitigate these risks, and without considering the operator's control environment⁴. The risks are thus purely related to the size and characteristics of the operator's data flows. Examples of inherent risks are mentioned in the table below. Please note that the table does only provide some examples and that in each case the inherent risk very much depends on the specific installation or aircraft operator.

Non-exhaustive examples of potential sources of inherent risk

- complexity and number of emissions sources and fuels used
- malfunctions, shut-downs or changes in the production process
- addition of new emission sources or removal/closure of existing ones
- not storing aircraft and flight data in a central data base
- prevailing information security environment within which the data is managed (who has access, rights, etc.)
- ACARS message missing⁵
- significant manual transfers and input of data concerning fuel supplies, lab results etc.
- complex data management systems for collecting data and quantifying emissions (e.g. multiple spread sheets related/ linked to each other) or changes in data management
- Inconsistent or complex monitoring methodologies and reporting policies (including where operators have multiple reporting methods for different reporting purposes)
- unit conversions when consolidating information from components

The verifier identifies and analyses the operator's inherent risks on the basis of documentation received (the information mentioned in Article 10 of the AVR). During this assessment specific attention is given to the operator's own risk assessment. Other checks will include carrying out preliminary analytical procedures and data management document review.

Checks performed during the risk analysis	AVR requirement
Preliminary analytical procedures (which may form part of the	Article 15(3) (a)
strategic analysis) involve an analysis of the fluctuations and trends in	
the data in order to detect inconsistencies and deviations; and to	
identify the nature and size of the inherent risks. The analysis will allow	
the verifier to understand the nature, complexity and relevance of the	
reported data, and to develop a verification approach. At this stage the	
verifier will compare detailed calculation data with data from previous	
year(s) and ask the operator for an explanation of any obvious	

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³ Data flow activities are all operational activities and systems that are necessary to produce a report from primary data. This includes measuring, monitoring, collecting, recording, processing, analysing and calculating parameters and handling subsequent data.

⁴ For guidance on the meaning of control environment please see section 3 of the Explanatory Guidance (EGD I).

⁵ For an explanation on ACARS please see the specific guidance on the verification of aircraft operator's reports (GD III)

⁶ During the process analysis the risk analysis may need to be revised as a result of findings on-site, further control and data testing, further interviews and evidence gathered. The risk analysis is an iterative process.

Checks performed during the risk analysis	AVR requirement
differences. These differences and other deviations in the data could	
point the verifier to existence and possible size of inherent risks.	
The data management document review entails an assessment of	Article 14(a)
whether the data management system is in line with the approved	
monitoring plan and the MR Regulation (MRR) and whether the	
management system is functioning properly. Deviations of the data	
management systems from the monitoring plan and MRR should point	
the verifier to the existence of further inherent risks.	

If some of the verification activities have been carried out over different phases during the reporting period, instead of in a combined verification covering the whole reporting period, it may occur that in some cases part of these preliminary tests will take place before the end of the reporting period, depending on when the verification commences. Later in the verification process (process analysis) more detailed checks will be made to ensure that the reported data is actually free from material misstatements. This is especially true if findings during the verification process require the verifier to revise the risk analysis and to develop further verification activities and checks.

Once the inherent risks have been identified, the verifier shall assess the magnitude of these inherent 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. A high inherent risk with low impact on the reported data, e.g. in a de-minimis source stream, should be assessed and dealt with differently from a medium risk with high impact on the reported data, e.g. a medium risk of material misstatement in a major source stream.

The assessment of inherent risks and their ranking gives an indication where misstatements could arise in the reported data and where a non-conformity (with the permit or monitoring plan) or non-compliance (with the MRR) could exist in the data management system. It will also provide information on the likelihood of these risks occurring (e.g. a high risk means very likely for a material misstatement to arise).

Step III: Preliminary analysis of the control activities

If the inherent risks of a misstatement in a data flow activity are high⁷, this particular data flow activity and its population shall be subject to extensive data testing, unless appropriate control activities have been put in place to mitigate these inherent risks. An important aspect is therefore the analysis of the control activities and the confidence the verifier has in the robustness and adequacy of the control activities. This will in turn point the verifier to the control risks.

Meaning of control activities	AVR	More guidance	
	requirement		
Control activities are any acts carried out or measures implemented by the operator to mitigate inherent risks.	Article 3(11)	Key guidance note process analysis (KGD II.3)	

⁷ See step II on magnitude inherent risk.

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Control activities can include quality assurance of information technology systems used for data flow activities, quality assurance of the measurement equipment used, segregation of duties in data flow activities and control activities, internal reviews and/or validation of data, control of out-sourced processes, corrections and corrective action and keeping records and documentation. Robust control activities and an effective control environment at the level of the operator will lead to lower control risks and may greatly reduce requirement for detailed data testing by the verifier.

In this preliminary analysis the verifier will therefore assess the adequacy of the control activities in terms of their ability to prevent misstatements arising in the reported data including misstatements as the result of a non-conformity⁸ or a non-compliance⁹. During the process analysis¹⁰ the control activities will be tested in more detail.

Art. 14(b) (c)

Step IV: Identifying and assessing control risks

The verifier has to identify and analyse control risks, which are defined as follows in the AVR:

Definition control risk	AVR requirement
Control risk means the susceptibility of a parameter in the operator's or	Article 3(16)
aircraft operator's report to misstatements that could be material,	
individually or when aggregated with other misstatements and that will	
not be prevented or detected and corrected on a timely basis by the	
control system.	

Control risks are therefore risks that the control system may not be adequate to prevent, detect or correct misstatements in a timely manner. These are risks related to the adequacy and correct application of the control system. The control system consists of the operator's own risk assessment and related control activities established by the operator to address these risks. Section 5.5 of MRR Guidance Document 1 (GD1) explains what a control system entails (Section 6.3 in MRR Guidance Document 2 for aviation (GD2)). Further information on how to test the control system is also provided in the key note on process analysis. Examples of control risks are mentioned in the table below. Please note that the table does only provide some examples and that it depends very much on each specific installation or aircraft operator.

Examples of potential sources of control risks

- automated controls in the IT system that are missing or not functioning properly
- internal audits that have not been correctly performed
- there is no separation of data input from data checking (i.e. the checking is done by one person which means there is no proper segregation of duties as required by Article 61 of the MRR)
- internal data reviews and the checking of the manual transfers of data that are not carried out, or not carried out to the rigour required in view of the inherent risk level
- the person responsible for the control activities is not or not sufficiently knowledgeable regarding the task concerned

⁸ Non-conformity: any act or omission of an act which is contrary to the approved monitoring plan and, for installations, the permit.

⁹ Non-compliance with the MRR.

¹⁰ Please see for further information the key guidance note on process analysis (KGD II.3).

Examples of potential sources of control risks

 there is no or irregular calibration and maintenance of key measurement systems and instruments

The verifier identifies and analyses control risks on the basis of inconsistencies in the operator's documentation and by interviewing key personnel responsible for the control activities. Other checks include carrying out *preliminary analytical procedures (Article 15 (3)(a) of the AVR)* and the *preliminary assessment of the control activities* mentioned under step III of this note (Article 12(1) (b) of the AVR).

The following factors are relevant when assessing the control risk:

- 1. The organization of tasks, responsibilities and competences in the monitoring and reporting processes. This includes for example:
 - the extent to which duties are segregated. The control risks are considerably higher if measurements, calculations, analyses, checks and reporting of data are not performed by separate persons¹¹;
 - where relevant the role of subcontractors. If there is no quality assurance review on the work delivered by subcontractors, the control risks are likely to be higher;
 - the competence of personnel involved in the monitoring and reporting process. Where the personnel responsible for collecting, monitoring and reporting data are not sufficiently competent, this will increase the control risks. On the other hand, the existence of proper training methods is likely to mitigate control risks relating to the competence of personnel and their application of control processes;
 - the way in which misstatements are being prevented, identified or rectified by the operator;
 - changes in the monitoring and reporting process compared with previous years;
 - the existence and effective functioning of management systems such as EN ISO 9001, EMAS, EN ISO 19011 or EN ISO 14001 and (certified) computer information systems covering the activities under verification and how these relate to, and properly integrate, the emission reporting process;¹²
 - sections of the installation that are being audited by third parties and the written proof thereof.

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For small and simple installations the need for segregation of duties is less relevant. The inherent risk may be low for small and simple installations which implies less robust or in some cases minimal control activities. This in turn will affect the way the verifier assesses the control risk related to the control activity in the installation.

If an installation has such an environmental management system, there should be some quality assurance of the CO₂ monitoring. However please note that having an environmental management system does not always mean that there is proper quality assurance. The verifier should at all times check the quality assurance and other control activities in place. If the procedures of that management system have been audited by a certification organisation in the context of checking the ISO certificate, this can be considered as one of the control activities in place to mitigate the risks. The extent to which the verifier can rely on that control activity and may have confidence in that control, depends on the extent to which the scope of ISO auditing matches EU ETS verification and the emission reporting process as well as the extent to which the emissions accounting process has been properly integrated in the quality management system or environmental management system. Please be aware that prior auditing does not exempt the verifier from checking the data and compliance of the systems.

- 2. The calibration and maintenance of measurement equipment or other measures that have been implemented by the operator to prevent misstatements from occurring (e.g. cross checks on fuel data, corroborative calculations to substantiate measured data). This also includes factors such as the nature and frequency of calibration and the proper design specification and installation of metering etc.;
- 3. Whether the information systems being used are part of the normal administrative/operational information systems in the installation or the aircraft operator. Where the information systems are separate from the normal information systems, the control risks are likely to be greater: e.g. when activity data are kept in separate spread sheets and not automatically generated from finance or process control systems;
- 4. The adequacy of the interface between the main information system(s) and the emission monitoring and reporting database/ spread sheets;
- 5. The adequacy and robustness of procedures listed in the approved monitoring plan;
- 6. The manner in which data, data flow activities, control activities and procedures for control activities are implemented and documented. Where these activities are not properly documented, the control risks are higher, especially when there are changes of staff who are responsible for elements of the accounting process;
- 7. Changes in the operator's risk assessment and control activities compared to previous years and the reason for those changes. Improvements to the risk assessment and control activities will result in a reduction of the control risks.

Once the various control risks have been identified, the verifier shall assess the magnitude of each control risk. As with the inherent risk, the verifier determines and ranks the magnitude of the control risks into high, medium and low risks. High control risks mean that the control system is in such a state that it is likely not to prevent, detect and correct misstatements and that there is a considerable to high risk that these misstatements individually or aggregated with other misstatements will lead to material misstatements. Medium risks mean that the verifier is not sufficiently confident that the control system will prevent, detect and correct a misstatement which could lead to material misstatements. A low risk will likely result from a well-structured, well-documented, well-implemented and well-maintained control system.

Step V: Determining the verification risk and verification approach

The verification risk consisting of inherent risks, control risks and detection risks, shall be reduced to an acceptably low level to obtain reasonable assurance as the basis for a verification report that positively states that the operator's report is correct. The verifier reduces the verification risk through the design and implementation of the verification process. This will impact on how detailed the verification plan is that is set up and implemented.

Requirement to reduce the verification risk	AVR requirement
The verifier shall set up and implement the verification plan such that the	Article 13(4)
verification risk is reduced to an acceptable level to obtain reasonable	
assurance that the operator's or aircraft operator's report is free from	
material misstatements	

Verification risk is defined as follows.

Definition verification risk	AVR requirement
Verification risk is the risk that the verifier expresses an inappropriate	Article 3(17)
verification opinion and issues a satisfactory verification opinion	
statement in a situation where the operator's or aircraft operator's report	
is not free of material misstatements.	

Issuing an inappropriate verification opinion will occur when the verifier fails to detect a mistake which is reflected in the detection risk.

Definition detection risk	AVR requirement
Detection risk is the risk that the verifier does not detect a material	Article 3(1)
misstatement	

Whereas the inherent and control risks are very much related to activities of the operator, the detection risk concerns the nature, extent and timing of verification activities. Based on the assessment of the inherent and control risks, the verifier will design, plan and implement the various verification activities such that the detection risk is reduced to a level that results in an acceptable verification risk. As mentioned in section 1, the verification risk can be expressed by the formula:

Verification Risk (VR) = Inherent Risk (IR) x Control Risk (CR) x Detection Risk (DR)

The verification risk is set at 5% in accordance with the confidence level (95%) needed to obtain a reasonable level of assurance. To ensure that the verification risk is not higher than required, the verifier will design the verification plan in such a way as to arrive at a sufficiently low detection risk that will compensate for the inherent risks and control risks of the operator. However, in most practical situations the precise quantification of the inherent and control risks is a matter of judgment by the verifier, and the verifier's assessment will therefore rank the risks in semi-quantitative terms of high, medium or low risk. The following table shows how the acceptable level of detection risk may vary based on the verifier's assessment of the inherent and control risks.

		Verifier's assessment of the control risk is:		
		High	Medium	Low
Verifier's assessment	High	Very Low	Low	Medium
of the inherent risks	Medium	Low	Medium	High
is	Low	Medium	High	Highest

The shaded areas in the table relate to the assessment of the detection risk. It highlights that, if both the inherent risk and the control risk are high, the verifier has to apply more detailed and strengthened verification activities and increase the sample size to lower the detection risk to a very low level. If however both the inherent and the control risks are low, the verification activities can be less extensive and elaborate implying that the verifier can accept a higher detection risk. In a similar way at intermediate levels for the inherent and the control risks, the verifier will set the verification activities at an intermediate or more average level, thereby accepting a medium detection risk.

Please note that **in no situation** the assessed levels of inherent and control risks can be sufficiently low to eliminate the need to perform any data testing or testing of control activities.

The key guidance note on sampling (KDG II.4) will explain how the verifier can determine the level of verification risk and the detection risk as well as how all the factors and elements together determine the verification and sampling approach.

3. Risk analysis is an iterative process

The verifier's risk analysis directs the verification effort to weaker areas of the operator's data generation, control environment, control system, management and reporting processes, i.e. those areas that give rise to an increased risk of misstatement or non-conformity. Based on the risk analysis the verifier sets up a verification plan and designs its detailed verification activities.

If during the verification the verifier identifies additional risks that need to be reduced or concludes that there is a lower actual risk than initially expected, the risk analysis and verification plan has to be updated. This means that the risk analysis as any part of the verification process is an iterative process and subject to change when this is necessary. Other findings during the verification might also result in the need to revise the risk analysis and subsequently modify and/or repeat verification activities. If the verifier detects non-conformities or finds out that the control activities in place are not adequately designed according to the requirements of the MRR, the verifier will have to revise its risk analysis since this can impact the magnitude of the inherent or control risk. A higher control risk would lead to more substantive data testing or more detailed testing of the control activities.

Art. 12(4) AVR

4. How does the verifier's risk analysis relate to the operator's or aircraft operator's risk assessment?

The operator has to establish, document, implement and maintain an assessment of the inherent and control risks. The outcome of this risk assessment determines to what extent control activities should be set up or improved and to what extent an evaluation of the overall control system is to take place. If the operator does the risk assessment properly, it should not differ much from the verifier's conclusions on the existence and nature of the inherent and control risks.

Art. 58 MRR

During its own risk analysis, the verifier has to consider the operator's risk assessment. This provides information on the operator's perspective of risk and whether it has made an adequate appraisal of the risks involved, and so whether it has designed proper control activities to mitigate the inherent risks. If the verifier determines that the operator has failed to identify relevant inherent or control risks in its risk assessment, the verifier must inform the operator thereof. If the operator has not updated its risk assessment by the time the verifier issues the verification report, the verifier shall report this in the verification report as a recommendation for improvement.

Art. 27(3)(p) Art. 30(1)(a) AVR Moreover, the verifier will assess the operator's risk assessment also in the following situations:

- According to Article 47(3) and 54(3) of the MRR the operator of an installation with low emissions and a small emitter aircraft operator are not required to submit the risk assessment to the competent authority. This however does not exempt the operator from making, implementing, documenting and maintaining an assessment of the inherent and control risks which will have to be checked by the verifier;
- According to Article 13 of the MRR the competent authority shall carry out a simplified risk assessment before approving a simplified monitoring plan. The operator has to provide the verifier with that risk assessment at the beginning of verification. If the verifier has identified that the simplified risk assessment made by the competent authority does not reflect the actual situation of the operator, the verifier shall inform the operator thereof and list this as a recommendation for improvement in the verification report.

Art. 10 AVR

Art. 12(3) Art. 30(1) AVR

5. Output of the verifier's risk analysis

The overall assessment of the various risks involved provides information and effective input into the verification plan that needs to be drawn up at the end of the risk analysis. More information on the content of the verification plan is provided in section 3.2.5 of the Explanatory Guidance on the articles of the AVR (EGD 1).

Section 3.2.5 EGD I