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**This publication was withdrawn on 31 March 2023**

We have withdrawn this publication because it is out of date.

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**Technical Guidance Note  
(Monitoring)**

**M3**

**How to assess monitoring arrangements for  
emissions to air in EPR permit applications**

**Environment Agency  
Version 2  
January 2016**



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## Record of amendments

Version number	Date	Amendment
V2	Jan 16	Update of each section
		Deleted Annex A EPR Regulatory Requirements for Monitoring
		Deleted Annex B Requirements for Other EC Directives
		Deleted Annex B1 Main Parts of the LCPD (2001/80/EC) relevant to Monitoring Requirements/Decisions
		Deleted Annex B2 Main Parts of the WID (2000/76/EC) relevant to Monitoring Requirements/Decisions

## Status of this document

This TGN may be subject to review and amendment following publication. The latest version is available on our website at:

[www.mcerts.net](http://www.mcerts.net)

## Feedback

If you have any comments on this document please contact Rupert Standing at [rupert.standing@environment-agency.gov.uk](mailto:rupert.standing@environment-agency.gov.uk).

# Assessment of monitoring arrangements: emissions to air

## 1 Introduction

This guidance is to help our staff and operators assess the acceptability of monitoring arrangements for emissions to air proposed by operators in applications for permits under the Environmental Permitting (England and Wales) Regulations 2013.

Most EPR determinations can be completed without need for input from specialist monitoring personnel. If specialist help is needed, it is available from the Monitoring and Assessment Team (Site Based Regulation).

Our Monitoring Technical Guidance Notes (TGNs), Monitoring Quick Guides and details of MCERTS requirements and approved instrumentation are available from [www.mcerts.net](http://www.mcerts.net). All the documents are regularly updated, so check this website for the latest version.

## 2 Our Monitoring Certification Scheme (MCERTS)

We introduced our Monitoring Certification Scheme (MCERTS) to improve the quality of monitoring data, promoting confidence via product certification of instruments, the certification of competent personnel and the accreditation of organisations.

Performance standards have been published for monitoring air, land, water and environmental data management software. Details of MCERTS performance standards and a quick guide on manual stack emissions monitoring can be found at [www.mcerts.net](http://www.mcerts.net).

We consider the use of MCERTS approved products and monitoring services to be best practice, and in many cases it is a means of demonstrating compliance with the legal requirements for monitoring when standards are legally binding. Operators should fit MCERTS certified instruments to new plants and use organisations accredited to MCERTS for emissions monitoring.

EPR Permit Condition 3.5.3 states that:

*“Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing by the Agency.”*

Condition 3.5.1 covers point source emissions to air, water, sewer/effluent treatment plant or other off-site transfers, as well as potentially surface water or groundwater, noise, ambient air, process monitoring and land. A drafting note that accompanies Condition 3.5.1 specifies that this condition *should only be used in conjunction with the monitoring conditions where it is needed for the activity. The phrase “and the environmental or other monitoring” will only be inserted into the MCERTS condition when it is needed for that activity type. If agreeing to some other standard whilst the operator develops MCERTS accreditation then an improvement condition shall be included that either sets clear deadlines for MCERTS accreditation to be achieved or proposes a timetable for achieving the standard.*

Access to lists of MCERTS certified products are available from [www.csagroupuk.org](http://www.csagroupuk.org). Information on MCERTS accredited organisations for stack emission monitoring can be found from [www.ukas.org](http://www.ukas.org).

### **3 Overview of monitoring standards and appropriate methods**

Technical Guidance Note (Monitoring) M2, 'Monitoring of Stack Emissions to Air', is a key reference document for point source emissions to air. It provides guidance on different approaches to monitoring stack emissions, sampling strategies and choice of technique, method and equipment.

Continuous monitoring, using continuous emissions monitoring systems (CEMs), is required for some processes regulated under the IED, such as large combustion plants (with a thermal rating of over 100 MWs) and waste incinerators.

Periodic monitoring, using manual sampling and analysis methods, may also be required. Periodic monitoring may be used for demonstrating compliance with emissions levels or for calibration of CEMs.

TGN M2 provides an index of methods / measurement techniques for continuous and periodic measurements. This is used to select the methods that an operator is required to use to measure stack gas emissions. The choice of method is based on relevant EC Directives, where the use of relevant CEN (Comité Européen de Normalisation) standards is mandatory.

If a CEN standard is not available then monitoring standards should be used in the following order of priority:

- International Standardisation Organisation (ISO)
- National standards

TGN M2 specifies a number of methods that are alternatives to CEN or ISO methods. It is acceptable for an operator to use these, provided it is agreed with us in writing.

If the substance cannot be monitored using standards covered by the above, then occupational methods published by the organisations below are specified in TGN M2:

- Methods for the Determination of Hazardous Substances (MDHS)
- National Institute for Occupational Safety and Health (NIOSH)
- Occupational Safety and Health Administration (OSHA)

The methods detailed in Part 2 of TGN M2 should be used for regulatory monitoring.

Occasionally, operators may have to develop their own method because the method specified in TGN M2 is not suitable for their application. The operator should validate this method to confirm that it is fit for purpose. An improvement condition may be appropriate in some cases to attain this.

### **4 Arrangements of sample locations and facilities**

Stack emission measurements should be carried out at suitable locations, which have appropriate sampling ports and platforms.

Our environmental permit application form requires the applicant to assess the sampling locations used to measure point source emissions to air against the requirement of TGN M1.

BS EN 15259:2007 describes specific requirements regarding the selection of satisfactory sampling positions for particulates, gases and CEMs. Our Technical Guidance Note M1,

'Sampling Requirements for Stack Emission Monitoring' refers to this standard and provides additional guidance. TGN M1 is a key Environment Agency reference document.

Positioning of sample locations to ensure representative sampling is more complex for sampling of **particulate** based emissions (such as dust, metals, dioxins and furans), than for gases because the distribution of gases in a stack tends to be much more homogeneous. TGN M1 explains the principles of representative sampling.

The positioning of sampling locations for measuring **gaseous** species is usually more straightforward. It will generally be sufficient to confirm that the gases are homogeneously distributed in the stack. We have produced a Method Implementation Document for BS EN 15259, which makes recommendations for the scope of homogeneity tests.

New plant must meet the criteria in BS EN 15259:2007 and TGN M1. Improvement programme conditions may also need to be set to review the feasibility and to implement changes to bring existing installations up to the same standards.

A check sheet for plant designers/operators to review their sample facility requirements can be found in TGN M1, Annex 1.

## 5 Arrangements for continuous emission monitoring systems

The requirements for sampling locations specified in Section 4 of this note also apply to the monitoring locations for CEMs.

Installations using CEMs will require additional sample ports to allow access for periodic sampling, using reference methods, to calibrate the CEMs and to sample other substances.

The CEMs should be positioned as close as possible to the locations to be used for their calibration, but far enough away, so that they are not affected by sampling probes used for periodic monitoring. Likewise, the CEMs equipment projecting into the stack should not affect periodic monitoring. It is preferable for the CEMs to be downstream of the sample location used for periodic monitoring.

## 6 Quality assurance of continuous emission monitoring systems

We need to be confident that CEMs selected for use are capable of meeting the measurement uncertainty requirements specified in the IED. Standards relevant to achieving this objective are BS EN 14181, Quality Assurance of Automated Measurement Systems, and BS EN 13284-2, Stationary Source Emissions – Determination of Low Mass Concentration of Dust: Part 2 Automated Measuring Systems (relevant to particulate monitoring only).

BS EN 14181 and BS EN 13284-2 apply to all waste incinerators and large combustion plants. The principles also apply to any other processes that use CEMs for regulatory monitoring. Our TGN M20, *Quality assurance of continuous emission monitoring systems* provides additional interpretation of requirements.

BS EN 14181 specifies three Quality Assurance Levels (QALs) and an Annual Surveillance Test (AST) to perform the following functions:

- QAL1 is a procedure to demonstrate that the CEMs are suitable for the intended purpose before installation. MCERTS certification demonstrates that CEMs meet the requirements of QAL1.

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- QAL2 specifies a procedure to calibrate the CEMs and determine the variability of the measured values. This calibration procedure entails taking parallel measurements with a periodic reference method, and then using the data to determine a calibration function.
- QAL3 specifies a procedure to maintain and demonstrate the required quality of the measurement results during the normal operation of CEMs, by checking that the zero, span and precision characteristics are consistent with those determined during QAL1.
- The AST specifies a procedure to evaluate whether (i) the CEMs functions correctly and its performance remains valid and (ii) its calibration function and variability remain as previously determined.

The monitoring arrangements in a permit should ensure these quality assurance measures are complied with.