



# Environmental Protection Agency

## Office of Environmental Enforcement (OEE)

### Guidance Note on monitoring of Stack Gas Emissions from Medium Combustion Plants: Air Guidance No. 11 (AG11)

**Jan 2021**

© Environmental Protection Agency  
Johnstown Castle Estate  
Wexford, Ireland.

---

**Foreword**

This guidance note is one of a series providing guidance on monitoring to regulators, process operators and those with interests in monitoring.

It provides information on how to monitor emissions from medium combustion plants and specified generators.

**Feedback**

If you have any comments on this guidance note, then please contact the air thematic team at

Email: [AirThematicTeam@epa.ie](mailto:AirThematicTeam@epa.ie)

**Status of this guidance note**

This guidance note may be subject to review and amendment following its publication. The latest version can be found at: [www.epa.ie](http://www.epa.ie)

**The original version of this guidance note was prepared and published by the EPA in 2007. This document is a revision of that original that has been prepared to reflect the changes in regulatory and monitoring practices that have occurred in the interim. The table below lists the main amendments to the original.**

Version No.	Date	Amendment
2	Jan. 2021	Update of Section 7.0 Approach to Monitoring, those operating under Schedule 2 will only have to measure for CO.

## CONTENTS

<b>1.0 Introduction</b> .....	1
<b>2.0 Background</b> .....	2
<b>3.0 The Registration Process</b> .....	2
<b>3.1 MCP Register</b> .....	3
<b>4.0 Emission limit Value: Compliance with ELVs</b> .....	3
<b>5.0 Exemptions</b> .....	7
<b>6.0 Accredited stack emissions monitoring</b> .....	8
<b>7.0 Approach to Monitoring, including reference conditions</b> .....	8
<b>8.0 Parameters measured</b> .....	9
<b>9.0 Sampling Location and Sampling Ports</b> .....	9
<b>9.1 Gaseous pollutant measurement</b> .....	10
<b>9.2 Particulate measurement</b> .....	10
<b>9.3 The site review</b> .....	10
<b>9.4 Stack identification</b> .....	11
<b>9.5 Power supply</b> .....	11
<b>9.6 Sampling platform</b> .....	12
<b>9.7 Access Facilities and Services</b> .....	12
<b>10.0 Contact us</b> .....	13
<b>Appendix 1: SCHEDULE 3: MONITORING OF EMISSIONS AND ASSESSMENT OF COMPLIANCE from MCP Regs, S.I. No. 595/2017</b> .....	14
<b>References</b> .....	15

---

## 1.0 INTRODUCTION

This guidance note has been produced to provide a standardised approach to monitoring stack gas emissions from plants regulated under the Medium Combustion Plant Directive (MCPD).

Medium sized combustion plants (MCPs) are a significant source of emissions of air pollutants. Implementation of the MCPD makes an important contribution to improving air quality by providing a means to reduce emissions of sulphur dioxide (SO<sub>2</sub>), particulate matter (PM), and oxides of nitrogen (NO<sub>x</sub> as NO<sub>2</sub>.)

MCPs are used to generate heat for large buildings (such as, offices, hotels, hospitals, and prisons) backup generators on data centres and industrial processes, as well as for power generation. Implementing the MCPD will help to reduce air pollution, by bringing in emission controls for these combustion plants in the 1-50 MW net rated thermal input range. The MCPD requires all plants in scope to be registered by the EPA, and sets limits on the levels of pollutants that these plants can emit. It also requires operators to test emissions from their plants to demonstrate compliance with emission limit values (ELVs).

## 2.0 BACKGROUND

The [Medium Combustion Plant Regulations](#) were signed into law in December 2017. Their purpose is to limit emissions to atmosphere from boilers and other stationary combustion plants in the 1-50 MWth (thermal input) range. The directive covers all fuel types. The regulations transpose the [Medium Combustion Plant \(MCP\) Directive \(\(EU\) 2015/2193\)](#) which was adopted in 2015.

The regulations limit the level of emissions allowable from new combustion plants from 20th December 2018, while operators of existing MCPs will have longer to comply with stricter emission standards. This will assist in limiting the impact on human health, vegetation, and biodiversity, which can be caused by air pollution.

A “combustion plant” is defined as “...any technical apparatus in which fuels are oxidised in order to use the heat thus generated”, so it will cover boilers, turbines, and engines. The regulations apply to both new and existing equipment, between 1 and 50MWth. Regulation 4(3) sets out exemptions for some specific combustion plants.

They are referred to as “medium”, because large combustion plants “LCP” (i.e. those >50 MWth) are covered by the Industrial Emissions Directive (2010/75/EC), while small combustion plants (up to 500 kWth) are covered by the Ecodesign Directive (2009/125/EC).

An “existing medium combustion plant” means a medium combustion plant put into operation before 20 December 2018. A “new medium combustion plant” is any MCP that is not existing, i.e. an MCP first put into operation on or after 20th December 2018.

**A new MCP must meet the relevant requirements of the Regulations from the date it is put into operation.** For example, an MCP first put into operation on 20th December 2018 must be registered by this date (unless it is on an installation controlled by an IE, or IPC licence), and is required to meet the relevant emission limit values from this date.

## 3.0 THE REGISTRATION PROCESS

In order to register an MCP, operators must complete the registration process through the online [EDEN portal](#)

NOTE: If you are a first-time user of the EDEN portal you will need to create a user login account using the “Sign Up” option, and follow the instructions provided. On signing up, you should request access to the MCP module. After this, you can log in via the EDEN portal to register a new MCP or to request changes to existing registrations. There are extensive user instructions in the “Help” section of the EDEN portal site; but if you require further assistance in relation to technical issues or queries on EDEN registration, please use the follow email address:

- [eden@epa.ie](mailto:eden@epa.ie)

On receipt of all the required information, the Agency will register the MCP, and issue a Certificate of Registration to the operator. The Agency will also add the MCP to the MCP Register. The MCP Register contains key information relating to the MCP, including any relevant Emission Limit Values, and it is advisable that the operator consults the MCP regulations to ensure they are fully informed of the requirements placed on the operator of a registered MCP. The operator should also check the

applicable footnotes in the Regulations which may provide further information, such as the various exemptions, derogations and variations from the prescribed ELVs.

### 3.1 MCP REGISTER

View the [MCP Register](#). This register contains the key information relating to MCP.

## 4.0 EMISSION LIMIT VALUE: COMPLIANCE WITH ELVS

An emission limit value is a parameter value set up for a pollutant which must not be exceeded over a measured time. ELVs are set in the regulations based on combustion plant type, size, fuel type, and age (i.e. new or existing). These ELVs are default values that may be reduced by the Agency in particular instances where lower ELVs are required for environmental protection purposes. This might occur where, for example, air quality problems in an area are considered by the Agency to be caused or partly caused by MCP emissions. [See Regulations 11(5) and 11(6)].

Anyone operating or planning to operate an MCP should ensure that they understand the obligations of the Regulations, in particular, the applicable ELVs. See the detailed footnotes in the Regulations that clarify and, in some cases, modify the ELVs for specific applications. Various exemptions and derogations may also be applicable. The size of the MCP will also determine the different ELVs. These are listed in the Tables below:

### Part 1 of SCHEDULE 2

- From 1 January 2030, emissions into the air of SO<sub>2</sub>, NO<sub>x</sub>, and dust from an existing combustion plant with a rated thermal input of **less than or equal to 5 MW** shall not exceed the emission limit values set out in Tables 1 and Table 3 of Part 1 of Schedule 2 of these Regulations

*Table 1*

**Emission limit values (mg/Nm<sup>3</sup>) for existing medium combustion plants with a rated thermal input equal to or greater than 1 MW and less than or equal to 5 MW, other than engines and gas turbines**

Pollutant	Solid biomass	Other solid fuels	Gas coal	Liquid fuels other than gas oil	Natural gas	Gaseous fuels other than natural gas
SO <sub>2</sub>	200 <sup>(1)(2)</sup>	1 100	-	350	-	200 <sup>(3)</sup>
NO <sub>x</sub>	650	650	200	650	250	250
Dust	50	50	-	50	-	-

<sup>(1)</sup> The value does not apply in the case of plants firing exclusively woody solid biomass.

<sup>(2)</sup> 300mg/Nm<sup>3</sup> in the case of plants firing straw.

<sup>(3)</sup> 400 mg/Nm<sup>3</sup> in the case of low calorific gases from coke ovens in the iron and steel industry.

- From 1 January 2025, emissions into the air of SO<sub>2</sub>, NO<sub>x</sub>, and dust from an existing medium combustion plant with a rated thermal input **greater than 5 MW** shall not exceed the emission limit values set out in Tables 2 and 3 of Part 1 of Schedule 2 of these Regulations.

*Table 2*

Emission limit values (mg/Nm<sup>3</sup>) for existing medium combustion plants with a rated thermal input greater than 5 MW, other than engines and gas turbines

Pollutant	Solid biomass	Other solid fuels	Gas oil	Liquid fuels other than gas oil	Natural gas	Gaseous fuels other than natural gas
SO <sub>2</sub>	200 <sup>(1)</sup> <sup>(2)</sup>	400 <sup>(3)</sup>	-	350 <sup>(4)</sup>	-	35 <sup>(5)(6)</sup>
NO <sub>x</sub>	650	650	200	650	200	250
Dust	30 <sup>(7)</sup>	30 <sup>(7)</sup>	-	30	-	-

<sup>(1)</sup> The value does not apply in the case of plants firing exclusively woody solid biomass.

<sup>(2)</sup> 300mg/Nm<sup>3</sup> in the case of plants firing straw.

<sup>(3)</sup> 1 100 mg/Nm<sup>3</sup> in the case of plants with a rated thermal input greater than 5 MW and less than or equal to 20 MW.

<sup>(4)</sup> Until 1 January 2030, 850 mg/Nm<sup>3</sup> in the case of plants with a rated thermal input greater than 5 MW and less than or equal to 20 MW firing heavy fuel straw.

<sup>(5)</sup> 400 mg/Nm<sup>3</sup> in the case of low calorific gases from coke ovens, and 200 mg/Nm<sup>3</sup> in the case of low calorific gases from blast furnaces, in the iron and steel industry.

<sup>(6)</sup> 170mg/Nm<sup>3</sup> in the case of biomass.

<sup>(7)</sup> 50mg/Nm<sup>3</sup> in the case of plants with a rated thermal input greater than 5 MW and less than or equal to 20 MW.

Table 3

Emission limit values (mg/Nm<sup>3</sup>) for existing engines and gas turbines

Pollutant	Type of medium combustion plant	Gas oil	Liquid fuels other than gas oil	Natural gas	Gaseous fuels other than natural gas
SO <sub>2</sub>	Engines and gas turbines	-	120	-	15 <sup>(1)</sup> <sup>(2)</sup>
NO <sub>x</sub>	Engines	190 <sup>(3)</sup> <sup>(4)</sup>	190 <sup>(3)</sup> <sup>(5)</sup>	190 <sup>(6)</sup>	190 <sup>(6)</sup>
	Gas turbines <sup>(7)</sup>	200	200	150	200
Dust	Engines and gas turbines	-	10 <sup>(8)</sup>	-	-

<sup>(1)</sup> 60 mg/Nm<sup>3</sup> in the case of biogas.

<sup>(2)</sup> 130 mg/Nm<sup>3</sup> in the case of calorific gases from coke ovens, and 65 mg/Nm<sup>3</sup> in the case of low calorific gases from blast furnaces, in the iron and steel industry.

<sup>(3)</sup> 1 850 mg/Nm<sup>3</sup> in the following cases

(i) For diesel engines the construction of which commenced before May 2006.

(ii) For dual fuel engines in liquid mode.

<sup>(4)</sup> 250 mg/Nm<sup>3</sup> in the case of engines with a rated thermal input equal to or greater than 1 MW and less than or equal to 5 MW.

<sup>(5)</sup> 250 mg/Nm<sup>3</sup> in the case of engines with a rated thermal input equal to or greater than 1 MW and less than or equal to 5 MW; 225 mg/Nm<sup>3</sup> in the case of engines with a rated thermal input greater than 5 MW and less than or equal to 20 MW.

<sup>(6)</sup> 380 mg/Nm<sup>3</sup> for dual fuel engines in gas mode.

<sup>(7)</sup> Emission limit values are only applicable above 70% load.

<sup>(8)</sup> 20mg/Nm<sup>3</sup> in the case of plants with a rated thermal input equal to or greater than 1 MW and less than or equal to 20 MW.



**Part 2 of SCHEDULE 2:**

- From 20 December 2018, emissions into the air of SO<sub>2</sub>, NO<sub>x</sub>, and dust from a **new medium** combustion plant shall not exceed the emission limit values set out in **Part 2** of Schedule 2 of these Regulations

*Table 1*

Emission limit values (mg/Nm<sup>3</sup>) for new medium combustion plants other than engines and gas turbines

Pollutant	Solid biomass	Other solid fuels	Gas oil	Liquid fuels other than gas oil	Natural gas	Gaseous fuels other than natural gas
SO <sub>2</sub>	200 <sup>(1)</sup>	400	-	350 <sup>(2)</sup>	-	35 <sup>(3)</sup> <sup>(4)</sup>
NO <sub>x</sub>	300 <sup>(5)</sup>	300 <sup>(5)</sup>	200	300 <sup>(6)</sup>	100	200
Dust	20 <sup>(7)</sup>	20 <sup>(7)</sup>	-	20 <sup>(8)</sup>	-	-

<sup>(1)</sup> The value does not apply in the case of plants firing exclusively woody solid biomass.

<sup>(2)</sup> Until 1 January 2025, 1 700 mg/Nm<sup>3</sup> in the case of plants which are part of SIS or MIS.

<sup>(3)</sup> 400 mg/Nm<sup>3</sup> in the case of low calorific gases from coke ovens, and 200 mg/Nm<sup>3</sup> in the case of low calorific gases from blast furnaces, in the iron and steel industry.

<sup>(4)</sup> 100 mg/Nm<sup>3</sup> in the case of biogas.

<sup>(5)</sup> 500 mg/Nm<sup>3</sup> in the case of plants with a total rated thermal input equal to or greater than 1 MW and less than 5 MW.

<sup>(6)</sup> Until 1 January 2025, 450 mg/Nm<sup>3</sup> where firing heavy fuel oil containing between 0.2 % and 0.3% N and 360 mg/Nm<sup>3</sup> when firing heavy fuel oil containing less than 0.2% N in the case of plants which are part of SIS or MIS.

<sup>(7)</sup> 50 mg/Nm<sup>3</sup> in the case of plants with a total rated thermal input equal to or greater than 1 MW and less than or equal to 5MW;  
30 mg/Nm<sup>3</sup> in the case of plants with a total thermal input greater than 5 MW and less than or equal to 20 MW.

<sup>(8)</sup> 50 mg/Nm<sup>3</sup> in the case of plants with a total rated thermal input equal to or greater than 1 MW and less than or equal to 5 MW.

Table 2

Emission limit values (mg/Nm<sup>3</sup>) for new engines and gas turbines

Pollutant	Type of medium combustion plant	Gas oil	Liquid fuels other than gas oil	Natural gas	Gaseous fuels other than natural gas
SO <sub>2</sub>	Engines and gas turbines	-	120 <sup>(1)</sup>	-	15 <sup>(2)</sup>
NO <sub>x</sub>	Engines <sup>(3)(4)</sup>	190 <sup>(5)</sup>	190 <sup>(5)(6)</sup>	95 <sup>(7)</sup>	190
	Gas turbines <sup>(8)</sup>	75	75 <sup>(9)</sup>	50	75
Dust	Engines and gas turbines	-	10 <sup>(10)(11)</sup>	-	-

<sup>(1)</sup> Until 1 January 2025, 590mg/Nm<sup>3</sup> for diesel engines which are part of SIS or MIS.

<sup>(2)</sup> 40 mg/Nm<sup>3</sup> in the case of biogas.

<sup>(3)</sup> Engines running between 500 and 1 500 hours per year may be exempt from compliance with those emission limit values if they are applying primary measures to limit NO<sub>x</sub> emissions and meet the emission limit values set out in footnote (4)

<sup>(4)</sup> Until 1 January 2025 in SIS and MIS, 1 850 mg/Nm<sup>3</sup> for dual fuel engines in liquid mode and 380 mg/Nm<sup>3</sup> in gas mode; 1 300 mg/Nm<sup>3</sup> for diesel engines with ≤ 1 200 rpm with a total rated thermal input less than or equal to 20 MW and 1 850 mg/Nm<sup>3</sup> for diesel engines with a total rated thermal input greater than 20 MW; 750 mg/Nm<sup>3</sup> for diesel engines with > 1 200 rpm.

<sup>(5)</sup> 225mg/Nm<sup>3</sup> for dual fuel engines in liquid mode.

<sup>(6)</sup> 225 mg/Nm<sup>3</sup> for diesel engines with a total rated thermal input less than or equal to 20 MW with ≤ 1 200 rpm.

<sup>(7)</sup> 190 mg/Nm<sup>3</sup> for dual fuel engines in gas mode.

<sup>(8)</sup> These emission limit values are only applicable above 70% load.

<sup>(9)</sup> Until 1 January 2025, 550 mg/Nm<sup>3</sup> for plants which are part of SIS or MIS.

<sup>(10)</sup> Until 1 January 2023, 75mg/Nm<sup>3</sup> for diesel engines which are part of SIS or MIS.

<sup>(11)</sup> 20 mg/Nm<sup>3</sup> in the case of plants with a total rated thermal input equal to or greater than 1 MW and less than or equal to 5 MW.

## 5.0 EXEMPTIONS

There is a range of exemptions, derogations, and variations from the default limit values, which are set out in Regulation 13, and in the footnotes in Schedule 2. For medium combustion plants operating less than 500 operating hours per year, they will not need to comply with the emission limit values set out in Tables 1, 2, and 3 of Part 1 of Schedule 2, and will only have to measure for CO. If they use solid fuel, they will need to comply with an emission limit value for dust of 200 mg/Nm<sup>3</sup>.

For sites that have multiple medium combustion plants on site, and do not have ELVs, periodic monitoring of emissions to atmosphere must be carried out in accordance with Schedule 3 of the MCP Regulations. The frequency of testing on each stack can be determined by agreement with an EPA inspector. If this situation occurs, please submit a proposal to the EPA for agreement.

## 6.0 ACCREDITED STACK EMISSIONS MONITORING

Most MCP facilities will not carry out their own air emissions monitoring, but will instead employ a contractor to carry out the monitoring and provide a report, which can be submitted to the EPA. The EPA generally supports the approach of using external specialist service providers, and would not recommend that facilities attempt to carry out their own air emissions monitoring. This will ensure the generation of consistent high quality and robust monitoring data from MCP facilities. ISO17025 accredited air emission monitoring contractors operating in Ireland either receive their accreditation from the Irish National Accreditation Board (INAB), or else they operate under the United Kingdom Accreditation Service (UKAS).

An operator of an MCP with a thermal input less than 5MWth (1-5MWth) does not need to use ISO17025 accredited contractors to carry out air emissions monitoring. An MCP with a rated thermal input greater than 5MWth (5-50MWth) needs to use ISO17025 accredited contractors and the EPA will not accept monitoring results from a monitoring contractor who does not hold accreditation to the ISO17025 standard. Accredited contractors are required for larger MCP's because air emissions sampling and analysis is a particularly difficult aspect of environmental monitoring, and specialist equipment is required to be used. Both the sampling and analysis stages of air emissions monitoring require a high level of competency, and quality control. Both the operator and the monitoring contractor are expected to comply with EPA Air Guidance Notes AG1 and AG2. (See reference 1 & 2.)

For MCPs with a rated thermal input greater than 5MW, the EPA will not accept monitoring results from a monitoring contractor who does not hold accreditation to the ISO17025 standard.

## 7.0 APPROACH TO MONITORING, INCLUDING REFERENCE CONDITIONS

The Medium Combustion Plant Directive specify that emissions monitoring results are standardised to a dry gas, at standard temperature and pressure (273.15K and 101.3kPa). They are also reported to a reference O<sub>2</sub> concentration of 3% for liquid or gaseous fuels, 6% for solid fuels, and 15% for engines and gas turbines (further information available on reference conditions used in stack emissions monitoring is available from Air Emissions Monitoring Guidance Note (AG2). (Ref. 2).

For larger MCPs, measurements using continuous emissions monitoring systems (CEMS), may be used as an alternative to periodic measurements. This involves using an appropriately certified CEMS that is calibrated against parallel periodic measurements, which are carried out by an organisation with accreditation for these measurements. Further information is provided in Air Guidance Note on the Implementation of I.S. EN 14181 (AG3.)

Monitoring must take place in accordance with Schedule 3 of the MCP Regulations. See Appendix 1. Those operating under Schedule 2 they will only have to measure for CO, unless its solid fuel, they need to comply with an ELV for dust.

## 8.0 PARAMETERS MEASURED

The parameters that may require measurement are sulphur dioxide (SO<sub>2</sub>), oxides of nitrogen (NO<sub>x</sub> as NO<sub>2</sub>), carbon monoxide (CO), and Particulate Matter (PM), depending on the fuel used.

Some points to note regarding the measurement of combustion gases are:

1. Being the products of combustion there is generally the need to measure oxygen and sometimes moisture, so as to correct the emission concentrations to reference conditions. The measurement of reference quantities should be simultaneous.
2. For the measurement of NO<sub>x</sub> (as NO<sub>2</sub>), the most common methodology is chemiluminescence (SRM – Horiba), which does not measure NO and NO<sub>2</sub> separately, but converts one into the other. Certain analysers predict the latter, based on a normal combustion scenario. If predictions are used, it should be stated in the monitoring report.
3. Combustion sources that “cycle” on and off, can result in frequent surges of carbon monoxide. These surges can make it difficult to achieve a representative measurement (for example a 30-minute average). Start-up peaks in carbon monoxide must, nonetheless, be accounted for in the regulatory process. Normally the start-up and shut-down periods are removed from the monitoring data, since the process is not operating in a steady and representative manner (lower efficiency during these periods). A minimum of 30 minutes average data shall be obtained (after excluding start-up and shut-down.) This may require monitoring through several cycles, until 30 minutes (in several blocks) are achieved.
4. A common reason for spurious data is that the combustion process may have actually ceased. Oxygen concentration in the region of 20% to 21% is an unequivocal indicator of such an occurrence, however care should be exercised to ensure that high oxygen concentrations are not due to leaks within the sampling system itself. If the MCP cycles on and off during the monitoring period, then the time for monitoring will need to be extended to ensure that representative monitoring occurs.

Note: Non combustion gases may be caused by the direct emissions of process gases arising from a non-fuel origin. These non-combustion gases may include emissions, such as ammonia, formaldehyde, acid gases, or particulates. They are typically corrected only to referenced temperature and pressure.

In combustion processes, the measurement of CO<sub>2</sub> is required to determine the air density used in volumetric flow and isokinetic results calculations.

For 1-5 MWth (no accreditation), electrochemical cells (Testo) may be used for monitoring.

## 9.0 SAMPLING LOCATION AND SAMPLING PORTS

Operators of existing MCPs should monitor SO<sub>2</sub>, NO<sub>x</sub>, dust, and CO emissions to determine whether specific measures will be required to achieve compliance. These operators have until January 2025 (5- 50 MWth) or January 2030 (1 – 5 MWth) to achieve compliance.

The choice of sampling location and sample ports will depend on the parameters to be measured.

The parameters can be divided into two categories:

- General gaseous pollutants;
- Particulates (or dust)

## 9.1 GASEOUS POLLUTANT MEASUREMENT

Gases, unlike particulates, are not subject to momentum forces when moving in a gas stream. The following requirements should be met when installing sampling ports in stacks for monitoring gaseous pollutants:

- Sampling ports must be downstream of any abatement equipment.
- The composition of the gas should be homogeneous across the area of the sampling plane (i.e. the waste gas should be thoroughly mixed <sup>a</sup>.)
- See EN15259 or AG1 for more details.
- A single port is usually sufficient for the collection of gas samples.

Gas sample ports should be provided in addition to velocity ports, and should also be capped when not in use <sup>b</sup>.

<sup>a</sup> Section 8.3 of I.S. EN15259 has a procedure for determination of stratification within the duct.

<sup>b</sup> I.S. EN 15259 does not distinguish between the ports for gaseous and particulate measurement. All ports should be 125mm flanged opening and a number of ports are required to permit the segmented sampling across the sample plane, (i.e. as per isokinetic methods).

## 9.2 PARTICULATE MEASUREMENT

The sampling of particulates from stack emissions demands the most rigorous selection of sampling location. Accurate sampling of particulates requires that the waste gas flow is laminar (free from turbulence) and that the sample is collected isokinetically. Isokinetic sampling is an equal or uniform sampling of particles and gases in motion within the stack <sup>c</sup>.

The following steps should be followed when installing sampling ports in stacks for testing particulates:

- Sampling ports must be downstream of any abatement equipment.
- The best available sampling plane must be chosen <sup>d</sup>.

The sampling plane should be positioned in a length of straight duct of uniform cross section. This plane should be located at least 5 duct diameters downstream of the nearest obstruction and at least 2 duct diameters upstream of the nearest obstruction. Every effort should be made to locate the sampling ports away from sources of turbulence, such as fans, duct bends, and duct junctions. Where suitable sample planes exist in both vertical and horizontal sections of ductwork, the former should be chosen. See AG1 for more details.

<sup>c</sup> I.S. EN15259 section 6.2.2 now requires the same sample port consideration for both isokinetic and gaseous species

<sup>d</sup> The sampling plane is defined as the plane normal to the centreline of the duct at the sampling position.

## 9.3 THE SITE REVIEW

The site review or reconnaissance visit is a commonly used tool in advance of the monitoring visit. It has many practical benefits for the contractor and the host site, and may be undertaken in advance

of a final costing being agreed. The process is used to confirm the scope of the monitoring work, and to conduct a preliminary examination of all the monitoring locations on site.

The participants should include experienced members of the monitoring organisation, and preferably members of the monitoring team, the site environmental officer who is commissioning the work, and the site safety representative.

The purpose of a site review is to:

- Allow the host site, the contractor (and in some cases the regulator) to agree the scope of the monitoring, the number of emissions points, the time and date of measurement, the duration of the measurement. The monitoring programme must be designed to ensure that it will meet the monitoring objectives;
- Resolve any Health & Safety (H&S) issues with the operator. Where circumstances exist that would present an unacceptable risk to the contractor’s staff when carrying out monitoring then the host site should effect the necessary improvements before work begins;
- Collect information on the sampling facilities, i.e. sampling ports, sampling plane, essential services (e.g. electric supplies), working platform and access;
- Collect information on stack gas conditions;
- Collect information from the operator regarding process and abatement details that could affect the emission levels, and suitability of the measurement methods;
- Identify the operator’s process operating and self-monitoring information that is to be collected and reported at the time of carrying out the required measurements.

The site review process is covered extensively in I.S. EN 15259.

For further information please refer to Guidance note on site safety requirements for air emissions Monitoring (AG1.)

### 9.4 STACK IDENTIFICATION

All MCPs should be clearly labelled at the sample port. Labels should be weatherproof and identify the emission point as per its designation in the MCP registration.

For example:

<i>EPA MCP emission point</i>	
Emission point description:	_____
Emission point reference number (in-house):	_____
Emission point reference number (MCP reg no):	_____

Note: Where possible the in-house numbering system should be the same as that used in the MCP Reg No.

### 9.5 POWER SUPPLY

A 110V power supply should be provided at the point of monitoring. The normal 110V safety socket is rated at 16 amps. This may not provide enough power for stack sampling, which can demand up



to 100 amps depending on the amount of equipment, and types of tests being undertaken. Extension cables increase the risk of accident, and can be easily snagged on moving parts. External power points should be weather proofed. If a transformer is used to step down a 220v supply, it must be located at the power point. Extension cables carrying 220V should never be used.

## 9.6 SAMPLING PLATFORM

Inspection of working platforms which are 2 meters high, and used in construction is covered by Regulation 119 (1)(c) of S.I. No. 299 Safety, Health and Welfare at Work (General Application) Regulations 2007. A platform must not be used unless inspected within the previous 7 days. Regulation 119 (1)(a) is a more general clause that requires that work equipment used for work at height to be inspected, thus it applies to sampling platforms, scaffolding, ladders, work restraint systems and others. The regulations do not specify a period of inspection, but section 119 (1) (b) require inspection at "suitable intervals", where work equipment is exposed to conditions causing deterioration, which is liable to result in a dangerous situation, or, "as soon as practical" in exceptional circumstances, where safety might be jeopardised.

The manner of the inspection of sampling platforms should fulfil the necessary legal requirements. Those requirements relate to the competency of the person conducting the inspection, the format of the inspection report, and its retention at the site. The HSA provide a form for the inspection of work equipment (scaffolds, guard-rails, toe-boards, etc), which may be used to assist with compliance with Regulation 119. The form may be downloaded at:

[http://www.hsa.ie/eng/Publications\\_and\\_Forms/Forms/GA3\\_form.pdf](http://www.hsa.ie/eng/Publications_and_Forms/Forms/GA3_form.pdf)

In addition to routine inspections, the platform must be considered when preparing the risk assessment and safety statement pursuant to sections 19 and 20 of the Act. Thus a prior to use examination of the platform must be completed by a competent person<sup>e</sup>.

<sup>e</sup> The Safety and Welfare at Work Act 2005 defines a competent person: *For the purposes of the relevant statutory provisions, a person is deemed to be a competent person where, having regard to the task he or she is required to perform and taking account of the size or hazards (or both of them) of the undertaking or establishment in which he or she undertakes work, the person possesses sufficient training, experience and knowledge appropriate to the nature of the work to be undertaken.*

Regulation 107 of the regulations imposes additional requirements that relate to the use of scaffolding.

## 9.7 ACCESS FACILITIES AND SERVICES

The monitoring of emissions may be a planned event or, in the case of Agency independent monitoring, it may be unannounced. The operator is responsible for ensuring that the necessary facilities are in place at all reasonable times.

Access to sample ports:

The following access requirements must be satisfied for all of the operators' stacks:

- Access must be via secure stairway, permanent ladder or gangway.
- A working platform which is adjacent to the sampling ports, and provides adequate space for handling of equipment. The platform surface area must not be less than 5m<sup>2</sup>, with a minimum

width at any point of 2m, and a minimum length in front of access ports of 2m, or the length of the appropriately sized probe (including nozzles, suction/support tubes and associated filter holders) plus 1m, whichever is the greater.

- Open sides of platforms must be fitted with safety handrails and kickboards.
- The Health and Safety aspects of working at height are dealt with in greater detail in Guidance Note on Site Safety Requirements for Air Emissions Monitoring (AG1.) Shelter and protection from the elements may be required at exposed sites. Lifting apparatus may be required to raise sampling equipment to elevated locations.
- While cherry pickers and forklift trucks may be used to transport/lift equipment into place, they are generally not acceptable for use as a sampling platform except for very limited scopes of monitoring.

## 10.0 CONTACT US

For further queries, please contact:

Email: [airthematic@epa.ie](mailto:airthematic@epa.ie)

Telephone: 01-2680100



# APPENDIX 1: SCHEDULE 3: MONITORING OF EMISSIONS AND ASSESSMENT OF COMPLIANCE FROM MCP REGS, S.I. NO. 595/2017

## PART 1

### Monitoring of emissions by the operator

1. Periodic measurements shall be required at least:
  - every three years for medium combustion plants with a rated thermal input equal to or greater than 1 MW and less than or equal to 20 MW,
  - every year for medium combustion plants with a rated thermal input greater than 20 MW.
2. As an alternative to the frequencies referred to in point 1, in the case of medium combustion plants which are subject to Regulation 13(1) or 13(3), periodic measurements may be required at least each time the following numbers of operating hours have elapsed:
  - three times the number of maximum average annual operating hours, applicable pursuant to Regulation 13(1) or 13(3), for medium combustion plants with a rated thermal input equal to or greater than 1 MW and less than or equal to 20 MW,
  - the number of maximum average annual operating hours, applicable pursuant to Regulation 13(1) or 13(3), for medium combustion plants with a rated thermal input greater than 20MW.

The frequency of periodic measurements shall in any case not be lower than once every five years.

3. Measurements shall be required only for:
  - pollutants for which an emission limit value is laid down in this Directive for the plant concerned;
  - CO for all plants.
4. The first measurements shall be carried out within four months of the registration of the plant, or of the date of the start of the operation, whichever is the latest.
5. As an alternative to the measurements referred to in points 1, 2 and 3(a), as regards SO<sub>2</sub>, other procedures, verified and approved by the Agency, may be used to determine the SO<sub>2</sub> emissions.
6. As an alternative to the periodic measurements referred to in point 1, Member States may require continuous measurements. In the case of continuous measurements, the automated measuring systems shall be subject to checking by means of parallel measurements with the reference methods at least once per year and the operator shall inform the Agency about the results of those checks.
7. Sampling and analysis of polluting substances and measurements of process parameters as well as any alternatives used as referred to under points 5 and 6 shall be based on methods enabling reliable, representative and comparable results. Methods complying with harmonised EN standards shall be presumed to satisfy this requirement. During each measurement, the plant shall be operating under stable conditions at a representative even load. In this context, start-up and shut-down periods shall be excluded.

## REFERENCES

1. Environmental Protection Agency, OEE, Guidance Note on Site Safety Requirements for Air Emissions Monitoring (AG1)
2. Environmental Protection Agency, OEE, Air Emissions Monitoring Guidance Note (AG2),
3. Environmental Protection Agency, OEE Air Guidance Note on the Implementation of I.S. EN 14181 (AG3)
4. I.S. EN 15259:2007 Air Quality – Measurement of stationary source emissions – Requirements for measurement sections and sites and for the measurement objective, plan and report.