



Environmental Protection Agency  
Office of Environmental Enforcement (OEE)

Guidance Note on EPA requirements for  
Alternative Monitoring when Continuous  
Emission Monitoring Systems are off-line  
(AG12)

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This document was prepared by the EPA's Office of Environmental Enforcement's Air Enforcement team, August 2020. For further information please email [airthematic@epa.ie](mailto:airthematic@epa.ie)

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## **Section 1: Introduction**

EPA licence requirements typically state that “all automatic monitors and samplers shall be functioning at all times when the activity is being carried out, unless alternative monitoring or sampling has been agreed in writing by the Agency for a limited period”. This guidance aims to clarify the alternative monitoring options, which should be considered by licensees, when automatic monitors for air emissions are not operational, and the licensee proposes to continue operations at the site, which will lead to emissions to atmosphere, via the relevant emission points.

This guidance will apply mainly to those activities under Chapters III (Large Combustion Plants) and IV (incineration and co-incineration) of the Industrial Emissions Directive. In all cases, where licensees wish to propose, or have been requested to propose alternative monitoring arrangements, approval must be sought in advance from the EPA before implementation.

## **Section 2: Activities listed in Chapter III of the Industrial Emissions Directive (IED)**

The IED refers to the availability of Continuous Emission Monitoring Systems (CEMS) for combustion plants, and indicates that:

- For combustion plants, the IED (Annex V) specifies that any day, in which more than three hourly average values are invalid, due to malfunction or maintenance of the CEMS, shall be invalidated. If more than 10 days over a year are invalidated for such situations the competent authority shall require the operator to take adequate measures to improve the reliability of the automated measuring system.

Licensees must maintain records of all period of CEMS malfunction/maintenance, and these records shall be made available for EPA inspection.

### **Maintenance of CEMS**

It is advisable that the licensee has a comprehensive service agreement with their CEMS service provider, which means the provider will be on site quickly to attempt to remedy any fault. The service visit will determine the extent of the problem, and any further down time. If localised efforts to bring the duty CEMS back on line have failed, and if a standby or replacement CEMS is available, then these should be put into service, until the service provider has brought the duty unit back on line. If following assessment of the CEMS by the external service provider, it is determined that a further delay to the restoration of the unit to duty state is necessary, and if a standby or replacement CEMS is not available then alternative monitoring must be put in place. Typically, the EPA would expect that alternative monitoring would be in place within 48 hours of the CEMS becoming unavailable.

### **Standby and Replacement CEMS**

Standby means the CEMS unit is in hot standby mode, is fully serviced and calibrated, in accordance with the requirements of EN 14181, and is ready to enter service on the failure of the duty CEMS. Essentially this is a CEMS switch over, but its use does generally require Agency notification and written approval. The standby unit can make use of the duty heated line, or have an independent line. Data communication should be routed from the standby CEMS to the data acquisition and handling system (DAHS), during the temporary switch over, and data should be logged in the normal fashion, as soon as the backup CEMS becomes operational. A zero and span check should be performed before the unit enters service, and the results recorded. If the switch over coincides with a QAL 3 check then the zero and spans should be checked and recorded as normal.

Replacement means the CEMS is in cold standby mode, but is fully calibrated and serviced, in accordance with EN 14181. In this case, the duty analyser rack is swapped out with the replacement CEMS. Use of a replacement CEMS requires prior Agency notification, and written approval. The replacement CEMS should be allowed to reach normal operating conditions, as per operating instructions, before data recording begins. Again, data communication should be routed from the replacement CEMS to the data acquisition and handling system (DAHS), during the temporary switch over, and data should be logged in the normal fashion. A zero and span check must be performed, before the unit enters service, and the results recorded. As previously stated, in the case of standby, the replacement unit should make use of the duty heated line or have an independent line.

### **In-House Emergency Monitoring**

If no standby or replacement CEMS are available, the Agency may permit the use of in-house monitoring by the licensee, using their own equipment without the cessation of the activity. Monitoring must be carried out in accordance with the Agency's AG2 Index of Preferred Methods document, unless otherwise agreed by the EPA.

Licensees opting to perform in-house monitoring must adhere to the EPA in-house monitoring scheme, and comply with the requirements of the EPA Air Guidance Note for In-house Air Monitoring Teams (AG8).

Licensees would need to formally seek approval for In-house emergency monitoring before any monitoring can be carried out. The licensees must submit a proposal for agreement with the Agency in advance. The proposal shall include the following items as a minimum:

- Parameters to be monitored;
- Equipment details (make, model, accreditation certification, etc.);
- Sampling train details;
- Monitoring location;
- Staff competency details.

All equipment used by the licensee shall have a data logging function, and all raw data shall be logged and made available for inspection. The licensee shall as a minimum, maintain the following records:

- Training records for monitoring personnel;
- Service and calibration records for monitoring equipment;

- Certificates for calibration gases;
- Written procedures for monitoring and reporting.

In-house parallel monitoring by portable equipment does not qualify as continuous monitoring, and air emission monitoring data must be invalidated. Portable certified equipment, despite reliable, is not subject to the same quality assurance control as CEMS (QAL1, QAL2, QAL3), and are not necessary connected to the DAHS, where alarms and interlocks can be set. The licensee may use in-house monitoring equipment up to a maximum of 10 days within a one-year period.

### **Combustion Dynamics integrated system**

Combustion Dynamics may qualify as a suitable alternative for CEMS monitoring. The licensee must obtain prior approval for its use from the Agency. The performance and reliability of the Combustion Dynamics system must be demonstrated in any proposal. Any proposals would be studied in a case by case basis by the EPA.

Combustion dynamics would not be accepted as a permanent substitute of CEMS, and its use in case of CEMS failure would be restricted to 10 days in a year period, as per IED requirements.

### **Section 3: Activities listed in Chapter IV of the Industrial Emissions Directive (IED)**

The IED refers to the availability of Continuous Emission Monitoring Systems (CEMS) for incineration and co-incineration plants, and indicates that:

- For incineration and co-incineration plants, the IED (Annex VI) specifies that to obtain a valid daily average value, no more than five half-hourly average values in any day shall be discarded, due to malfunction or maintenance of the continuous measurement system. No more than ten daily average values per year shall be discarded, due to malfunction or maintenance of the continuous measurement system.
- For incineration and co-incineration plants, the IED (Annex VI) specifies that under no circumstances can the activity continue to incinerate waste for a period of more than four hours uninterrupted, where emission limit values are exceeded. The four-hour limit applies if compliance cannot be demonstrated, due to lack of operative CEMS.

Licensees must maintain records of all period of CEMS malfunction/maintenance, and these records shall be made available for EPA inspection.

#### **Maintenance of CEMS**

It is advisable that the licensee has a comprehensive service agreement with their CEMS service provider, which means the provider will be on site quickly to attempt to remedy any fault. The service visit will determine the extent of the problem, and any further down time. If localised efforts to bring the duty CEMS back on line have failed, and if a standby or replacement CEMS is available, then these should be put into service, until the service provider has brought the duty unit back on line.

#### **Standby and Replacement CEMS**

Standby means the CEMS unit is in hot standby mode, is fully serviced and calibrated, in accordance with the requirements of EN 14181, and is ready to enter service on the failure of the duty CEMS. Essentially this is a CEMS switch over, but its use does generally require Agency notification and written approval. The standby unit can make use of the duty heated line, or have an independent line. Data communication should be routed from the standby CEMS to the data acquisition and handling system (DAHS), during the temporary switch over, and data should be logged in the normal fashion, as soon as the backup CEMS becomes operational. A zero and span check should be performed before the unit enters service, and the results recorded. If the switch over coincides with a QAL 3 check then the zero and spans should be checked and recorded as normal.

Replacement means the CEMS is in cold standby mode, but is fully calibrated and serviced, in accordance with EN 14181. In this case, the duty analyser rack is swapped out with the replacement CEMS. Use of a replacement CEMS requires prior Agency notification, and written approval. The replacement CEMS should be allowed to reach normal operating conditions, as per operating instructions, before data recording begins. Again, data communication should be routed from the replacement CEMS to the data acquisition and handling system (DAHS), during the temporary switch

over, and data should be logged in the normal fashion. A zero and span check must be performed, before the unit enters service, and the results recorded. As previously stated, in the case of standby, the replacement unit should make use of the duty heated line, or have an independent line.

### **In-House Emergency Monitoring**

Due to the four-hour time restrictions in the IED, in-house emergency monitoring is not a realistic option for incineration plants, as the activity must cease after 4 hours of CEMS failure, if no standby or replacement CEMS are made operative.

In case of CEMS failure, co-incineration plants need to cease the incineration activity within 4 hours (no waste feed) and would, in the majority of cases, automatically fall under the activities in Chapter III of the IED. In such cases, Section 2 of this guidance document applies.

All licensees are required to submit a proposal to the EPA for agreement, for an alternative monitoring plan in the event of CEMS failure.

### **Summary**

The different options once CEMS are inoperative are summarised below:

#### **For Large Combustion Plants:**

- Back up CEMS (standby or replacement);

or

- In-house monitoring (adhesion to EPA AG8 scheme), for a maximum of 10 days in a year;

or

- Combustion dynamics, for a maximum of 10 days in a year.

#### **For Incineration and Co-incineration plants**

- Back up CEMS (standby or replacement);

or

- Stop waste feed for co-incineration plants after 4 hours, and proceed as a Large Combustion Plants (if relevant);

or

- Shut down after 4 hours for incineration plants.

This guidance will apply mainly to those activities listed under Chapters III (Large Combustion Plants) and IV (Incineration and Co-incineration) of the Industrial Emissions Directive. In all cases, where licensees wish to propose, or have been requested to propose alternative monitoring arrangements, approval must be sought in advance from the EPA before implementation.

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