

Monitoring Quick Guide 4

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RM-QG-04 Monitoring for incinerators and co-incinerators when CEMs are not available

1. Scope

This note describes the Environment Agency's requirements for incinerator and co-incinerator installations falling under Chapter IV of the Industrial Emissions Directive (IED)(2010/75/EU), and its associated monitoring-requirements in Annex VI, when the continuous emission monitoring systems (CEMs) are not available, such as when CEMs fail. In particular this note covers:

- Allowable surrogates for carbon monoxide (CO), Total Organic Carbon (TOC) and particulate matter (PM) during abnormal operation, as defined in the environmental permits.
- Suitable alternatives when CEMs are not available for periods not covered by abnormal operation.

2. Practical Guidance

2.1 Monitoring requirements of the IED for incinerators/co-incinerators

The law typically requires operators of incinerators/co-incinerator installations to monitor continuously the following determinands:

- Particulate matter (PM)
- Total organic carbon (TOC)
- Sulfur dioxide (SO₂)
- Nitrogen oxides (NO_x)
- Carbon monoxide (CO)
- Hydrogen chloride (HCl)

The permit may also require the following determinands to be monitored continuously, depending on specific circumstances.

| Determinand | Justification |
|----------------------------------|---|
| Nitrous oxide (N ₂ O) | If the installation uses fluidised beds in the combustion chamber, and/or there are indications that N ₂ O emissions may be significant. |
| Ammonia (NH ₃) | If the installation uses ammonia injection to control NO _x emissions, then the operator may be required to monitor for ammonia slip. |
| Hydrogen fluoride (HF) | If there is sufficient fluorine in the waste material, such that the incineration process creates HF. |

Additionally, operators are required to continuously measure so-called *peripheral* determinands, which include oxygen, moisture (if the gaseous monitors do not measure on a dry-basis), temperature and stack-gas pressure. Peripheral determinands are needed to correct the emissions of pollutants to standard conditions to allow comparison with the emission limit value (ELV).

2.2 Abnormal operation

Abnormal operations are periods of time when CEMs are unavailable or abatement plant has failed and exceedances of ELVs may occur. Annex VI, Part 3(2) of the IED specifies that the PM, CO and TOC emissions must not exceed prescribed backstop ELVs even during such periods.

In order to continue to feed waste when the CEMs are not available there are two options – *surrogate monitoring* (where operators have proposed surrogate mechanisms in their applications and we have determined these to be acceptable) or *alternative monitoring*.

2.3 Surrogate monitoring

Surrogate monitoring is defined as a substitute for actual monitoring for periods of up to four hours for CO, TOC and PM. The following are examples of surrogates:

- CO concentrations in the stack gas, which can be correlated with TOC emissions.
- Qualitative particulate monitors may be used as surrogates for PM monitoring.
- Quantitative monitoring for CO and TOC, which provide real-time data.

Surrogates do not need to comply with either the uncertainty budget requirements of the IED, or the requirements of CEN, ISO, national and other applicable standards for monitoring.

There are two caveats with surrogate monitoring:

- The operator must have demonstrated to the Environment Agency's satisfaction a meaningful relationship between the surrogate and the determinand which requires monitoring in the Application.
- Surrogate monitoring is not permitted for more than four hours on any one occasion and 60 hours total in any one year. Loading of waste must cease if these times are exceeded and the CEMs or alternative monitoring is not available.

2.4 Alternative monitoring

If the CEMs are not available for periods greater than four hours then operators must use *alternative* monitoring for all determinands where CEMs are normally used. If alternative monitoring is not available then loading of waste must cease.

Alternative monitoring is defined as a substitute for the permitted CEMs monitoring, where the alternative monitoring meets at least the same quality requirements as the installed CEMs monitoring described in the Application, for example:

- All forms of alternative monitoring shall comply with applicable international standards for monitoring.
- All forms of alternative monitoring shall meet the uncertainty budgets specified in the IED.
- Instrumental systems used within alternative monitoring arrangements shall be MCERTS certified for the applicable determinands and ranges.

Subject to the above requirements, allowable forms of alternative monitoring include:

- Full, back-up CEMs serving the same stacks as the principal CEMs.
- Portable monitoring systems, which are calibrated for the processes they are monitoring.
- Manual standard reference methods, provided that these are performed by a test laboratory accredited to EN ISO/IEC 17025 for the MCERTS performance standard for organisations and the applicable monitoring standards, and can provide real-time data in order to demonstrate compliance with the ELVs.

3. Further information

3.1 Quick Guides

- RM-QG-01 Selecting continuous emission monitoring systems (CEMs)
- RM-QG-02 CEMs for incinerators and co-incinerators

3.2 Technical Guidance Notes

- TGN M2 – Monitoring of stack emissions to air
- TGN M20 – Quality assurance of continuous emissions monitoring systems

4. Feedback

Any comments or suggested improvements to this note should be e-mailed to Richard Gould at richard.gould@environment-agency.gov.uk or internally to Gould, Rick.