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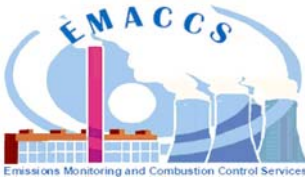
The EMACCS solution for EN 14181

EN 14181 is a European standard relating to the quality assurance of Automated Monitoring Systems (AMS) used to measure emissions from processes covered by the Waste Incineration Directive (WID) and the Large Combustion Plant Directive (LCPD). Existing Power generators & Waste Incinerators had to comply the directive by January 2008.

The requirements of EN 14181:

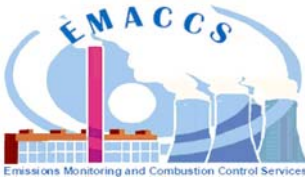
QAL1

- There are several requirements under this standard, firstly, the AMS should have undergone a series of tests to ascertain how accurate and reliable it is. This procedure is called QAL1. There are two competent testing authorities, primarily MCERTS and secondly TUV (Germany).
- AMS that have not undergone a QAL 1 should not normally be used on plant where compliance with EN14181 is required. This is because certain data from the QAL1 testing, such as uncertainty calculations, are required to enable the complex calculations within EN 14181. However, in certain cases, the Environment Agency allowed existing operators to continue with untested AMS for a limited period of time after the directive first came into force. However, this presented an issue when trying to determine the uncertainties required by the standard for QAL3 calculations as these can only be derived by QAL1 testing.
- EMACCS is able to check if an operator's AMS is QAL1 certified and if not can either, update them to a QAL 1 standard or integrate and install a package of analysers that meet the QAL standard. We are a recognised systems integrator with the skills to tailor a system to an operator's legislative requirement using the best analysers and Emissions Monitoring Software available.



QAL2

- Once an AMS is installed on site, the operator has up to six months to perform a QAL2 analysis. This analysis will be required every 3 or 5 years (dependent on process) with similar Annual Surveillance Tests performed in years when a QAL 2 is not required. QAL2 comprises of an MCERTS approved testing organisation performing a minimum of 15 tests per measurand over a period of 5 days. These tests are called Standard Reference Methods (SRM) because the methodology of the test is specified in a CEN standard.
- In essence, the testing company performs an SRM over a given period and produces an averaged result. The AMS also produces an average result for the same period and these paired results are used to calculate the following:-
 - Calibration function
 - Linearity
 - Certification range of the AMS for this measurand
 - Variability of results
 - Several other statistical functions including standard deviation
- The calibration function is then used to correct data generated by the AMS prior to it being used in reports etc. The **certification range** determines the range in mg/Nm³ over which the AMS results are deemed to be accurate.
- If the AMS fails to meet the QAL2 standard for any or all the measurands, it must either be repaired and/or the tests repeated. This can be a very expensive exercise and continued failure will probably result in the AMS being replaced.
- Using EMACCS to help you upgrade or replace your current system can drastically reduce the possibility of a QAL2 failure and the financial consequences of this. We can also engage an MCERTS certified testing organisation to perform the tests and provide a project manager to oversee the whole process to help provide a satisfactory outcome.
- Once the initial QAL2 has been performed, every year the AMS must undergo a QAL2 or an AST (a foreshortened QAL2) to ensure that it still remains accurate, linear and repeatable. Prior to the test team coming to site, EMACCS can provide high quality servicing for the AMS to ensure it enters the testing evolution in prime condition. Failure to pass a QAL2 or AST will result in full repeat QAL2 and the inevitable financial consequences of this.



QAL3

- Once the analyser has passed QAL2 and it has commenced normal operation the AMS must undergo regular quality assurance checks to confirm that it has not drifted in terms of accuracy. These QA checks are termed QAL3; they consist of injecting a zero or span sample into the AMS system to determine the AMS response to the test gas; this is done for all measurands. The matched pairs of data (test gas concentration and AMS output) are fed into an ongoing calculation which creates control charts to show AMS drift. This can be achieved automatically by using the **CEMWindows** Data Acquisition & Handling Software (DAHS) package available from EMACCS (distributor) or **G2 Data Systems Ltd** (Environmental Software House). See the CEMWindows link on the EMACCS website or go to <http://www.emaccs.co.uk/CEMWindows.html>
- There are 4 types of control chart that the user can use:
 - CUSUM
 - CUSUM Precision
 - Shewhart
 - Moving Median

The chart shows when the analyser goes “out of control” and at this point the AMS must be attended to by qualified service personnel.

- The data acquired during QAL3 testing must be retained for audit purposes at the next AST. Initiating manual zero and span checks and then manually entering the results into control chart software is time consuming and tedious. EMACCS is a distributor of **CEMWindows** software which stores, presents and reports emissions data. The same software gives the ability to store data points created in QAL3 tests, automatically create all the above mentioned control charts and create a report for the AST audit. In addition, we can build systems that automatically inject zero and span gases at specific times. The combination of **CEMWindows** software and EMACCS hardware provides an easy, simple and cost effective system for dealing with QAL3 quality assurance systems.



EN14181 can seem overcomplicated and daunting at first, but it is really effective at ensuring that AMS perform accurately and reliably. This in turn ensures that the emissions reports that operators are required to produce are of a similar high quality.

EMACCS can work with you in partnership to help you through the EN14181 process by:

- Upgrading non-compliant AMS
- Installing state of the art, EN14181-compliant AMS
- Engaging MCERTS approved testing teams
- Servicing AMS and preparing them for site testing
- Installing **CEMWindows** data acquisition and handling systems
- Automating the QAL3 process.

Further reading:

MCERTS – Performance standards for continuous emission monitoring systems. Environment Agency.

MCERTS – Procedures and general requirements for the compliance testing of continuous emission monitoring systems. Environment Agency.

Technical Guidance Note M1: Sampling requirements for monitoring stack emissions to air from industrial installations. Environment Agency.

Technical Guidance Note M2: Monitoring of stack emissions to air. Environment Agency.

Technical Guidance Note M20: Selection, installation, calibration and quality assurance of continuous emission monitoring systems. Environment Agency.

Method Implementation Document (MID 14181) Environment Agency

BS EN 14181 2004 Stationary Source Emissions – Quality assurance of Automated Measuring Systems British Standards Institute