



Shake-up for emissions testing

AIR MONITORING

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A new quality standard, now being introduced in the UK, is causing a widespread shake-up of the emissions testing industry as test houses and process operators in large combustion plants and the waste incinerators industry seek to review their analytical procedures and emissions monitoring systems.



The standard, known as EN 14181 – Statutory source emissions – quality assurance of automated measuring systems (AMS), has been developed by the European Committee for Standardisation (CEN) to improve air pollution standards by tighter monitoring of emissions. It is expected to have far-reaching consequences for regulators, equipment manufacturers, test houses and process operators alike.

Approved in October 2003 by CEN, the European standard became a published British standard on 2nd December 2004 and while compliance is not mandatory for all, the emissions industry is expected to adhere fully to the quality standard. However, there is still a significant lack of understanding about how the standard is being implemented in practice. As a result, the emissions testing industry in the UK and other parts of the EU has been actively seeking further guidance about how to upgrade existing analytical procedures and AMS (or continuous emissions monitoring systems as they are known in the UK), to be compliant with the new standard.

EN 14181 sets out quality assurance guidance, which should be followed to ensure that processes are compliant with the full breadth of EU environmental directives linked to air quality and deliver analytical results to meet the specified legislative requirements. Specifically, AMS installed to measure emissions to air must be capable of meeting the uncertainty requirements on measured values defined by EU environmental legislation. This legislation includes the Integrated Pollution

Prevention and Control (IPPC) Directive (96/61/EC); Waste Incineration Directive (2000/76/EC); Large Combustion Plant Directive (2001/81/EC) and the Solvent Emissions Directive (1999/13/EC).

To implement these quality assurance procedures, analysts and operators have to demonstrate their ability to carry out appropriate methods of analysis, with suitable measuring systems, according to three specified quality assurance levels (QAL1, 2 and 3), the latter of which relates directly to process operators. An Annual Surveillance Test (AST) must also be completed.

QAL 1 takes place before purchasing or during the purchase period of the AMS. It sets out a methodology for assessing the total uncertainty of AMS measured values, in order to establish whether existing monitoring systems and equipment is suitable. QAL 2 validates the AMS following installation. It sets out how to calibrate the AMS and determine the variable measured values needed for proper analysis. QAL3 covers the ongoing operation of the plant. It sets out ongoing quality control procedures, which involve checking that zero and span characteristics are consistent with those determined by QAL 1. A procedure for an annual surveillance test (AST) of the AMS is also defined to ensure it functions correctly and its performance remains valid.

For process operators, the new quality standard and the procedures it sets out will help them to achieve legislative compliance. Once appropriate automated emissions measuring systems are selected and installed, it falls to the process operator to ensure that QAL 3 procedures are carried out, as defined in EN 14181, as part of the plant's ongoing quality control. This will guarantee the ongoing quality of the emissions testing measurements. Process operators will also be responsible for ensuring that QAL 1 and QAL 2 procedures and the AST are carried out as and when required. Stack emission monitoring organisations accredited to ISO/IEC 17025 – an MCERTS performance standard – will be able to implement these procedures.

Implementing these new procedures requires skilled personnel. The UK's Source Testing Association has recently established the MCERTS competency standard for industrial process operators and test houses in the UK. All operators responsible for emissions control and monitoring systems now require minimum Level 2 MCERTS competency. From 2006, this will be a condition of the testing laboratory's or plant's UKAS accreditation.

While the main impact of the standard is on process operators and test houses, equipment manufacturers and speciality gas suppliers are also feeling the effect of the changes being introduced.

Industrial processes are now required to monitor uncertainty levels on analytical measurements for a broad range of emission compounds on a regular basis. Therefore the accuracy and reliability of calibration gas mixes is increasingly important. The tighter legislative demands also means that more complex gas mixtures, containing lower and lower concentrations and reactive components, are needed for use as calibration gases in order to analyse the emissions. As a result, ensuring the stability of such mixes has become more technologically demanding.

A series of technological advances have enabled the



speciality gases industry to support the emissions testing industry in raising the standard of quality procedures. In particular, Air Products has developed innovative filling techniques and cylinder treatments to ensure gas mixtures are of a consistently high quality, highly accurate and have optimum stability. Importantly, all gas mixtures are provided with ISO 6141 calibration certificates, specifying uncertainty levels for each of the component gases and ensuring traceability. Furthermore, Air Products produces environmental gas mixtures in its own ISO 17025 accredited European laboratory.

As well as providing these assurances of stability, accuracy and traceability for calibration gases, Air Products has also developed BIP®, a patented cylinder technology which provides consistently ultra high purity gases (less than 10 ppb oxygen and less than 20 ppb moisture) for use as carrier gas. This assurance of purity is vital for a wide range of analytical testing applications.

It is these kinds of incremental technological advances that are supporting test houses and process operators as they gear up to implement the quality procedures and achieve robust legislative compliance. By working in partnership with technological suppliers, the industry can lead the way to achieving tighter control of air emissions and minimising the impact of their processes on the environment.

For more information about BS EN 14181 and emissions testing visit:

Source Testing Association - www.s-t-a.org
Environment Agency's MCERTS – a certification scheme for instruments and monitoring and analytical services – www.mcerts.net Air Products – www.airproducts.com/expertis

Biographical note

Anne-Catherine graduated from the University of Liège as a chemical engineer. She started work at Air Products on the graduate programme, joining the speciality gases production facility in Keumiee, then taking a role as market analyst in speciality gas applications for the electronics industry. From here she spent 3 years working in industrial gas sales and since June 2002, she has held the position of marketing specialist for analytical applications and laboratories.