

First IMPRESS newsletter

Introduction

This is the first newsletter of the EMRP project “Metrology to underpin future regulation of industrial emissions” (IMPRESS), which aims to improve the technical possibilities to monitor emissions of pollutants to air to ensure compliance with EU directives and national legislation. This is key to enforcing emission limits and thereby enabling their reduction and control.

Industry needs to measure and report emissions for regulatory purposes including assessing stack emissions against concentration limit values, reporting annual mass emissions, and determining emissions of GHGs from area sources. In June 2014 a 3 Mio € project started within the European Metrology Research Programme for a three year period to investigate industrial emission measurements. It encompasses a multitude of national metrology institutes (NMI), universities and other stakeholders. Collaborators are welcome to link themselves to the project.

The project will address metrology needs in stack emissions monitoring, annual mass emission reporting and area source emission quantification. It will address traceable measurements of pollutants in stacks, assessing the capabilities of current reference methods to meet the challenges of lower emission limit values, developing test facilities within the European NMI community to test and validate methods and to support the development of next generation monitoring methods. It will develop improved approaches to determining the uncertainties in flow measurement and in annual mass emission values. It will provide protocols and methodologies for measuring and monitoring emissions from area (including fugitive sources), including the emissions of GHGs such as methane. Protocols will be developed, and assessed using simulated emission facilities developed within this project, and field validation at an industrial source.

Background to the Project

The stack emissions monitoring industry is heavily regulated. Plant operators are required to install continuous emission monitoring (CEM) systems to continuously monitor emissions and such systems must be type approved in accordance with EN 15267-3, which sets out minimum performance characteristics. The CEM systems are calibrated in accordance with EN 14181, using parallel measurements with the relevant standard reference method (SRM).

A method is only accepted by the European Committee for Standardization after satisfactory validation under real field conditions. Current state of the art is for emission limit values to be reduced and, the BREF (best available technique reference document) documents currently being developed, to list a number of associated emission limits that are lower than previous directive requirements.

With regard to proficiency testing, state of the art in the majority of Member States is to send out reference materials in ‘blind’ testing (e.g. gas cylinders, dust simulants etc.). The key issue here is that this only tests analytical proficiency not sampling proficiency, which is a key element of the SRM.

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Hence, validated facilities are needed if sampling proficiency is to be measured and if we are to understand if the sampling procedure of an SRM is still fit for purpose.

Current state of the art in emissions regulation is encapsulated in the industrial emission directive and in the BREF documents. There is currently little available research or data on the capability of the existing SRMs (typically validated over 10 years ago) to meet current emission limit values.

Research highlights

Stakeholder Feedback on current flow measurement methods (CMI, JV, NPL, VSL)

During the first months of the project stakeholders from companies operating emission sources and from institutions measuring the emissions from stacks have been contacted and asked for their opinion on current challenges in flow measurement in stacks. Several research topics were identified based on the stakeholders' response. The topics include a) investigation of "non-ideal" conditions in stacks and its influence to flow-rate measurement error and uncertainty where the non-ideal conditions can be: swirl in the flow, non-stationary flow, wall effects, effect of dust and droplets or temperature variations in a stack, and b) investigation of calibration of velocity probes in wind tunnels where two topics were addressed: blockage effect for large velocity probes and low turbulence intensity in a wind tunnel as compared to field conditions. These effects can cause high measurement errors or uncertainties if they are neglected. The most relevant topics will be selected for modelling or experimental investigation within the IMPRESS project.

Contact and further information

Every 6 months a newsletter of the project will be distributed. Please forward this newsletter to your colleagues. They can send an email to any of the project's representatives with subject "register IMPRESS newsletter" to register for this 6-monthly newsletter.

Additional information on IMPRESS and the partners can be found on the project homepage <http://projects.npl.co.uk/impres/>.

The IMPRESS project is carried out by the following partners / institutions:

NPL Management Limited (**NPL**), United Kingdom / Contact: Rod.Robinson/at/npl.co.uk

VSL B.V. (**VSL**), The Netherlands / Contact: mvdbeek/at/vsl.nl

Physikalisch-Technische Bundesanstalt (**PTB**), Germany / Contact: olav.werhahn/at/ptb.de

Český metrologický institut Brno (**CMI**), Czech Republic / Contact: jgersl/at/cmi.cz

Justervesenet (**JV**), Norway / Contact: gkv/at/justervesenet.no

Environmental Protection Agency (**DCMR**), The Netherlands / Contact: john.korsman/at/dcmr.nl

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