Measurement methods

Particles - the sampling issue!

An international workshop was recently held by the DETR in London to discuss the complex issues surrounding the accurate measurement of PM$_{10}$ with a much lighter consideration of whether the Wide Range Aerosol Classifier (WRAC) could also double-up as a burger van!! (You have to see it to believe it!)

Problems with PM$_{10}$ monitoring have arisen in all Member States due to the fact that the measurement method for PM$_{10}$ stated in the Daughter Directive is based upon the gravimetric method of sampling for which three possible Reference Methods are used: the Low Volume Sampler (LVS) PM$_{10}$ head; the High Volume Sampler (HVS) PM$_{10}$ Head and the Wide Range Aerosol Classifier (WRAC) PM$_{10}$ Head.

Historically, measurement methods in the UK (and other countries within the EU) have been based on continuous measurement methods such as the Tapered Element Oscillating Micro-balances (TEOMs) and β-attenuation monitors where good temporal resolution of data can be obtained (i.e. hourly average PM$_{10}$ concentrations). In order to satisfy the criteria of the First Daughter Directive, Member States must seek to prove equivalence of existing measurement methods for PM$_{10}$ against one of the three EU Reference Methods above.

In the UK, the DETR are currently funding a 12 month cross-comparison study between existing TEOM PM$_{10}$ methods and the LVS PM$_{10}$ Reference Method. 8-port LVS sequential samplers (Kleinfiltergerat PNS:X8 systems) have been installed at Thurrock, Marylebone Road, Harwell, Port Talbot and Glasgow Centre with a further one proposed for Belfast Centre site. Operated by existing local site operators, the sites have been chosen on the basis of covering a wide variety of particulate emissions sources and climatic variations across the UK. Also included in the study at three of the sites (Marylebone Road, Glasgow and Belfast) is the Rupprecht and Patashnick Partisol Plus 2025 gravimetric sampler – a sequential gravimetric sampler that enables up to 16 days consecutive samples without site attendance.

EN 12341; the reference method for PM$_{10}$ monitoring in the EU, clearly defines the procedures necessary for the accurate weighing and conditioning of unexposed and exposed filters. AEA Technology has been awarded the contract for this component of the work utilising their controlled climate room within their existing engine emissions testing facility.

Monitoring commenced at four of the six sites during the summer months this year and is scheduled to continue with additional sites coming on-line as and when ready. Preliminary analyses of results has included subjecting the data to rigorous statistical analysis subsequent to any detailed interpretation. We wait with bated breath!
Recent qualitative research into the public's perception of air pollution highlights the requirement for further improvement in public dissemination of the data acquired through the AURN. The report by Alan Hedges, funded by the Department of Health, was based on eight group discussions involving 62 participants, mainly among 'sensitive' target groups.

The results clearly indicate that traffic pollution and smoking were recognised as the main areas of concern. The study highlights that there is the perception that air pollution as a result of traffic is likely to become worse with increased traffic growth predicted for future years. Awareness of other pollutant sources (e.g. industrial, aircraft fuel, construction dust, etc.), were found to be dependent on the areas in which individuals were living. For example, participants in the Midlands were aware of the contribution of power station emissions to air pollution whilst concerns were expressed by those from West London with respect to aviation fuel.

The research highlights that most people mistrust government information. Previous health scares (for example, BSE, GM foods and salmonella in eggs) have taken their toll in casting doubts about secretiveness, vested interests and political pressures on the information given to the public. However, this mistrust seems more significant for certain kinds of information where statements about whether there is a problem tend to be more suspect than statements about the nature of the problem. Local authorities take heed; the research indicates that local authorities are perceived as not necessarily being more trustworthy than central government.

Participants highlighted that bulletin-type information would be acceptable from government, although the current bandings of LOW, MODERATE, HIGH and VERY HIGH were thought to create their own problems in perception and credibility with participants questioning the validity of a long string of 'LOWS'. Information given through news media/weather forecasts were thought to be the best access that the public could have to information on air pollution, although participants of the research highlighted the need to steer clear of the use of scientific names and jargon, and also the reporting of numbers. It was generally felt that reporting by exception was the best way of disseminating information.
Annual Review Meeting

The 9th Annual Review Meeting for members of the Network, held at the National Exhibition Centre, Birmingham, on October 8th, 1999, opened with a presentation by Steve Moorcroft of Stanger Science and Environment on an update of the activities of the network in the last year (see this edition: Particles – the sampling issue!). This was followed by presentations by Trudie McMullen (AEQ-Division, DETR) and John Tipping (Environment Agency) giving presentations on Local Air Quality Management and the new MCERTS scheme, respectively. Both NETECN (Jane Vallance-Plews and Brian Stacey) and NPL (Alan Woolley and Bryan Sweeney) provided updates on the activities for the QA/QC units in the afternoon session.

In contrast to previous years' discussion sessions, participants at this year's Review Meeting were given the chance to provide questions 'up-front'. A lively discussion in the afternoon session clearly indicated that this was the way forward. Of particular concern was the issues raised by a number of LSOs surrounding the provision of calibration cylinders (see this edition for NPL's response), and the criteria for which NETCEN remove data during ratification.

Copies of the Speaker's Notes will soon be sent out to all members and organisations of the AURN.

Review of site calibration cylinder arrangements

Following several comments expressed during the Annual Review Meeting in Birmingham, NPL has reviewed its system for sending out calibration cylinders to sites as old ones need replacing. In future, when NPL receives a fax showing that a cylinder pressure is low, they will now call the LSO to check the position and keep them informed, at the same time as the replacement is ordered. This should avoid problems with incorrect cylinder sizes being dispatched and other misunderstandings that were raised. NPL would also like to hear directly of problems or concerns relating to site cylinders as they arise, so that arrangements either at NPL or BOC can be improved as necessary.

Contact details for Alan Woolley and Bryan Sweeney are listed on the Who's Who? on the back page of NETWORK. Additional contact can be made using email (alan.woolley@npl.co.uk) or fax (0181 977 4591).
News update

Millennium Compliance (Y2K)
The Y2K programme which has been ongoing for the past 18 months is now virtually complete with, of the 87 stations in the network, only four DETR and three affiliated sites remaining that require logger upgrades. The DETR sites have been scheduled for early November and assurances have been given that the affiliated sites will be compliant before the end of the year.

The data management system has also been upgraded during the summer months and has been operating without problems, and we are as confident as we can be that the rollover into the new millennium will be without major incident. However, the proof of the pudding . . . .

Change in Stanger logo
Observant readers of this edition of Network will notice the new Stanger Science and Environment logo. The need for a new corporate identity has arisen as a consequence of a split at our parent company level with the formation of a new company, Carillion plc., formerly Tarmac Construction Services.

Winter blues . . .
It seems that it’s not just people that can’t deal with the clocks going back. The thought of long, dark, winter evenings is something that the Signal Ambirak systems just can’t handle. CMCU had a number of reports that the Ambirak systems had closed down as a result of the time change brought about by the move from British Summer Time to Greenwich Mean Time. Let’s wait and see what happens in the move to BST in the Year 2000!

Who does what in the Network?
The successful operation of the Network is dependent on the commitment and dedication from a large number of organisations, and the individuals within them. A brief reminder of who does what:

Central Management & Co-ordination Unit (CMCU):
Responsible for setting up new sites within the Network (including site selection and procurement of equipment); Network operation (appointment of ESUs and LSOs, co-ordination of equipment calibration and servicing); data collection and validation; data reporting.

Quality Assurance/Quality Control (QA/QC) Units:
Responsible for providing independent QA/QC checks on Network operations. This includes routine inter-calibration audits and data ratification. The QA/QC Units also provide advice on operation issues to the CMCU.

Equipment Service Units (ESUs):
Responsible for the routine and emergency servicing of analysers and ancillary equipment.

Local Site Operators (LSOs):
Responsible for undertaking routine site calibrations. The LSOs also provide invaluable information and feedback on site performance to both CMCU and QA/QC Units, and undertake initial investigations of site problems.