

Network

A newsletter for air quality monitoring networks Issue 1

Sponsored by the Department of the Environment, Transport and the Regions

Around the Network

Urban and Rural Networks combine

With effect from 1 April 1998, the UK Automatic Urban and Rural Networks have been combined into a single Network. Stanger Science & Environment (SSE) is acting as the Central Management & Co-ordination Unit (CMCU) and is supported by 2 independent Quality Assurance/Quality Control (QA/QC) Units. NETCEN is acting as QA/QC Unit for the urban sites, whilst the National Physical Laboratory (NPL) acts as QA/QC Unit for the rural sites. The South East Institute for Public Health (SEIPH) continues to manage monitoring stations in the London Air Quality Network (LAQN). The supply of all audit gas cylinders to all automatic monitoring stations within the Network is now being carried out by NPL.

For the DETR-owned stations within the Network, contracts for the Equipment Support Units (ESUs) and Local Site Operators (LSOs) were tendered by the CMCU earlier this year, and have now been awarded. In placing these

contracts, consideration has been given to the conclusions and recommendations within the independent review of the Network which was completed by Institutet för Vatten-Och Luftvårdsforskning (IVL) last year. The most significant change is that the requirement for weekend cover by the ESUs and LSOs has been removed in many cases, which has resulted in significant cost savings. It is felt that this will not have a serious impact upon data quality or data capture rates, but this will be held under close review over the forthcoming months.

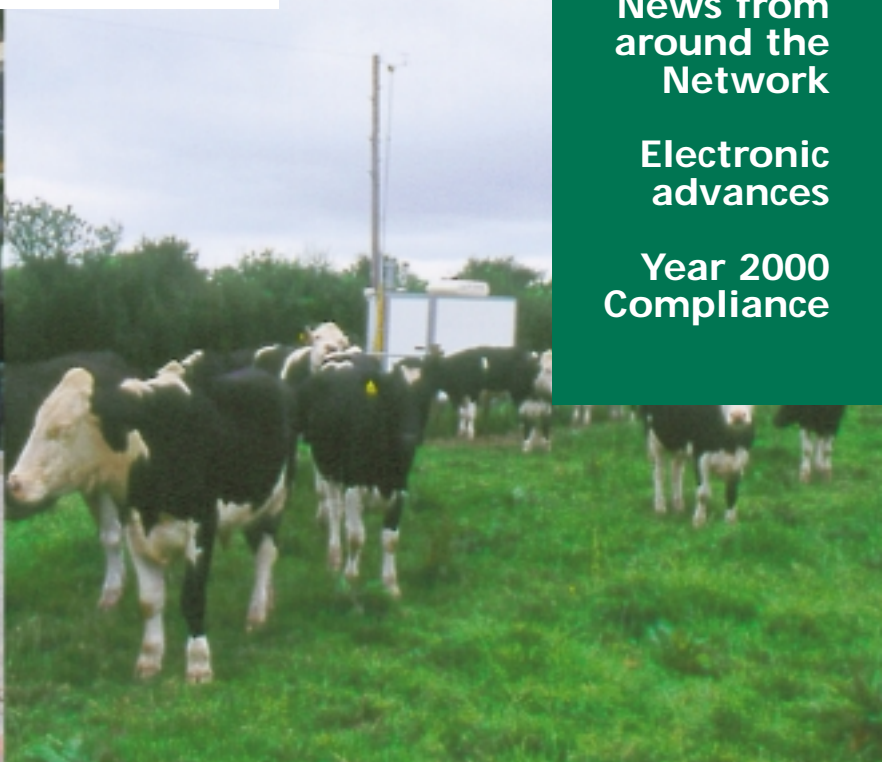
Other issues, which are also being considered, include the installation of remote diagnostic facilities at monitoring stations (where currently not available), and the use of remote-initiated calibrations. In the latter case, it is intended to operate a pilot scheme in London at the A3 roadside site where SSE acts as Local Site Operator.

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The electronic advance continues...

Intelligent Predictive Diagnostics

The need for maintenance of equipment within the Network is great; equipment has to run continuously, 24 hours a day, 365 days a year. With such an onerous duty cycle component failures cannot be ruled out. The focus to minimise repair time to reduce the loss of data thus becomes imperative.

The technique of *predictive maintenance*, common in process industries where any down-time costs money, is now being applied to air quality instrumentation. By recording key diagnostic parameters over a reasonable period of time, software can 'learn' the characteristic signature of the parameters and is then able to flag any deviations away from this pattern which may highlight a potential failure. Unlike simpler diagnostic systems, in which fixed thresholds are used to flag diagnostic alarms, this 'expert system' approach takes the characteristic variations in component specification into consideration. Loss of performance caused by component degradation can be spotted before it leads to system breakdown, and in some cases, repairs can be scheduled to take place during the regular maintenance intervention, reducing time out of service.

All in all, intelligent predictive diagnostics can be an additional tool in helping to reduce system down-time and should help in maintaining the data capture rate required for the UK Network for air quality.

Electronic mail calibration sheets

The development of electronic versions of the LSO calibration sheets are being considered for use in the Network. A move towards 'paperless' QA would be cheaper, faster and more efficient. The advantages are:

- electronic data are more easily transmitted, stored, read and analysed
- savings in time and operating costs would be made
- instrument faults could be more quickly identified at an earlier stage

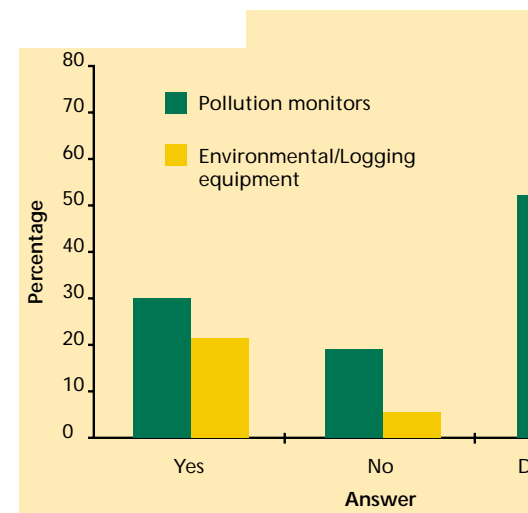
Before developing the idea further co-operation of LSOs and Network participants is sought by NETCEN. LSOs and ESUs are invited to make their comments known.

For further information contact: Jane Vallance-Plews (01235 463182)

Digital telephone connections

A pilot study involving the use of digital telephone technology (BT's ISDN communications system) is to start at Dunslair Heights (southern Scotland). The site presents problems which are common to many sites in remote rural areas where telephone communications are lacking and the installation of telephone cables is prohibitively expensive. Furthermore, the length of cable required for connection to existing systems increases the likelihood of interference and noise from external sources.

BT's ISDN system has advantages in that mobile phones can replace existing modems and reduce the transmission time of data transfer. Equally, the use of long communication cables is removed reducing the possibility of interference and noise. Digital telephone communications may represent an effective way in which data can be quickly transferred with the added bonus of saving money when compared to existing telephone bills.



Responses to Year 2000 questionnaire from affiliated site members.

Developments at Rochester

The University of Greenwich has installed two Burkard 7-day volumetric spore traps at two sites in Rochester operated by Medway Council. Although it is planned to operate the Burkard traps year-round, initially the data collected will be used this summer by final-year Geography and Environmental Science students to investigate children's lung function in relation to daily catches of pollen, spores and particulates and the levels of gaseous pollutants in the air. The investigation will also provide information on the general aerobiology at the two sites and any relationships between levels of man-made pollutants and biological particles in air. Another part of the study will assess the use of Burkard spore traps to monitor PM₁₀ levels.

Further information contact : Peter Jackson (0181 331 9800) or Dr Peter Burt (01634 883231)

...until the year 2000!

The issue of millennium compliance for computer based systems is now well recognised and sits high on the agenda for many organisations. The problem arises from the manner in which dates are represented in many computer systems and products which have date-logic embedded chips – many early systems simply represented the year by the final 2 digits e.g. 1998 as '98' – and will thus experience difficulty in recognising the Year 2000.

The Network is heavily reliant upon computer systems for data collection and management. In addition, the majority of analyzers, loggers and other ancillary equipment have embedded chips within them. SSE is coordinating the Millennium Compliance Programme for the Network in order to minimise any problems which might occur. Several tasks are being undertaken. These include:

- reviewing all hardware and software components used in the central data collection and management system. This is being carried out in association with the suppliers (Hewlett-Packard and SMHI).
- reviewing all hardware and software components at each DETR-owned monitoring station. This task is being carried out by ESUs for each component of the Network during the summer service period. The ESUs are due to report back to SSE by the end of September at which time any hardware or software upgrades that are necessary will be undertaken.

Of course the affiliated stations in the Network also need to be considered. In this case, SSE has written to all 35 affiliated site members asking them to identify equipment using date-logic embedded chips and to answer questions on whether such equipment is Year 2000 compliant. Initial response (25% returned) indicate that very few LSOs know whether the equipment being used at their site meet Year 2000 compliance.

Furthermore, a lack of information concerning warranties is evident. The response so far from affiliated sites gives cause for concern. It is essential that LSOs take responsibility for determining that air quality monitoring at their stations will continue beyond the year 2000. Not only is Year 2000 compliance concerned with the guarantee of equipment – **LSOs should obtain written proof through their ESUs concerning individual pieces of equipment** – but also, where possible, guarantee that equipment at the site has been tested and/or upgraded to meet Year 2000 compliance. Results of the initial assessment for affiliated sites indicate that we have a long way to go before assurance can be given that air quality monitoring will continue beyond the year 2000 at these sites.

*For guidance on Millennium Compliance contact :
Dr Richard Maggs (0181 256 4855).*

Welcome to the first edition of *NETWORK*, the newsletter of the Department of the Environment, Transport and the Region's Automatic Air Quality Monitoring Network.

It is intended that this newsletter will provide a useful forum for the dissemination of news, covering topics ranging from the current status of the Network and new DETR initiatives, to associated projects on a wider scale concerned with air quality work within the UK. It is also hoped that *NETWORK* will provide a useful medium for consultation concerning new initiatives and developments of the Network.

NETWORK is intended to be your newsletter. Initial consultation with Network operators has indicated a lot of enthusiasm for its production. Contributions have already been received with more being offered to form the basis of the second edition. We hope you enjoy reading this first copy of *NETWORK* and would be happy to receive any comments that you may have regarding content and format.

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Acknowledgment:

Many thanks to the following people who have contributed to this edition of *NETWORK*. Steve Moorcroft, Jeff Booker, Jane Vallance-Plews, Andrew Knott, Brian Stacey, Peter Burt and Fabia Pollard.

News update

New sites to join Network

A number of new monitoring sites are set to join the Network. Two rural research monitoring stations at Dunslair Heights (southern Scotland) and Weyborne (East Anglia) are set to provide data to the Network. The sites will be operated by the Institute of Terrestrial Ecology and the University of East Anglia, respectively. A further 6 DETR-owned stations are also to be established. SSE have let contracts to Signal Ambitech for the supply of 4 urban monitoring stations (measuring NO_x, O₃, SO₂, CO and PM₁₀) and to Thermo Unicam for the supply of 2 rural monitoring stations (measuring O₃, NO_x and trace level CO). The locations for the new sites have yet to be determined but will be decided in the light of forthcoming EC legislation.

TEOM Filter Archive

A new DETR initiative to gather further information on particles in the UK has recently started. SSE are co-ordinating the establishment of an archive of TEOM filters collected at all Network sites. The filters will be stored by SSE and released to research workers following the approval from DETR. As well as collecting filters from DETR-owned stations all affiliated sites are invited to participate in the archive.

Contact Nigel Jenkins at SSE for further details Tel: 0181 256 4858

Changes to site cylinder deliveries

On 1 April 1998, the responsibility for providing all Network calibration cylinders passed to the NPL. NPL determine the concentrations of reliable commercially-supplied gas mixtures against their own national standards, with subsequent delivery from NPL to sites as required, usually by BOC.

LSOs are now asked to complete the cylinder information form indicating cylinder pressures and return them to CMCU, NPL and QA/QC units. NPL cylinders can be identified by referring to the blue sticker, e.g. "N123", when reporting on them. Furthermore, LSOs are asked to bear in mind that BOC drivers will be new to the access arrangements at sites and note they are also supposed to remove Messer (MG) cylinders.

WHO'S WHO?

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intercalibrations

cylinder supplies

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.

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