

## Fall 2000 Abound with EURACHEM Events

The 3<sup>rd</sup> EURACHEM workshop on proficiency testing (PT) was held in Borås, Sweden on 24 - 26 September 2000. The event was organised together with the European Committee for External Quality Assurance Programmes in Laboratory Medicine (EQALM). Its four areas, analytical chemistry, microbiology, laboratory medicine and accreditation, were evenly represented by some 135 participants from 30 countries (*see comprehensive report on pages 4 - 5*).



As a special event of EUROANALYSIS XI, (3 - 8 September 2000, Lisbon, Portugal), a very well attended EURACHEM/CITAC workshop on Metrology in Chemistry was held. Nine invited lectures covered all currently discussed aspects of the topic, including lectures on the need for metrology in chemistry (by BIPM president T. Quinn), traceability (I. Papadakis, IRMM/Belgium), computer-aided MU estimation (M. Roesslein of EMPA/Switzerland), or recovery and matrix effects (S. Ellison of LGC/UK, on the photo during his talk).

The 5-day EUROANALYSIS XI conference, an initiative of DAC/FECS, was presided by DAC President of the Portuguese Chemical Society and EURACHEM Vice Chair Maria Filomena Camoes. Being a major event for the community of analytical chemists, the conference evolved in three parallel sessions each day, of the highest scientific level, covering in depth hot topics in the field. Four plenary lectures and 30 invited lectures, including the FECS LECTURE of the year 2000 "The Stratospheric Ozone Hole: A Human caused Chemical Instability in the Stratosphere" which was delivered by Prof Paul Crutzen (Chemistry Nobel Prize in 1995), were complemented by the EURACHEM/CITAC and 3 more workshops, 91 oral and 425 poster contributions.

*EURACHEM is about quality in chemistry. Is this congruent with your professional fields of interests?*

My work at NMI and my tasks for EURACHEM are highly congruent. I am heading the department of Chemistry at NMI, which is the Dutch National Metrology Institute or the national measurement standards institute. The most important field in my department is the production and certification of primary measurement standards for the gas manufacturing industry. They find application as the highest level calibration standards in the field of natural gas analysis, legislation (breath and odor analysis), emission measurements, and ambient air quality. To demonstrate the quality of these standards, a high degree of international comparability under the umbrella of the BIPM is necessary, which is reflected in our participation in international comparisons of gas standards from different NMI's and bilateral comparisons with NIST and NPL. The quality of our work is our trademark.

### Interview with the Chairman

*Does your work in quality and standards also reflect your personal interests?*

I have already a long interest in "quality" of analytical chemical measurements. In 20 years at the university, quality of the research was, of course, the determining factor, but this objective was never laid down in formalized quality systems. The EURACHEM working group "AQA at Universities" with Bernd Neidhart addresses these problems today.

My first activities in "quality" started when I became the head of the

analytical department in the Environment Institute in TNO. The name of TNO had always been sufficient for acceptance of the quality of the results, but during the eighties accreditation according to the EN 45001 standard became more important. Then, the Dutch Government announced that contracts in environmental analysis would be given only to laboratories which held an accreditation as a test laboratory,

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## Objective, tasks and interests

The objective is to provide a common European forum on metrology in chemistry. The general tasks and areas of common interest are:

- to develop, improve and apply primary methods and reference materials for chemical measurements
- to support and act for the development of national and international chemical measurement structures
- to provide a pragmatic approach to measurement traceability and measurement uncertainty and to establish links to SI where appropriate
- to undertake regional key comparisons and supplementary comparisons, and to provide links with CCQM
- to undertake research in metrology, to support different sectors in chemistry
- to disseminate expertise and knowledge on metrology in chemistry through seminars, guides, conferences, comparisons, etc.

## Organisation

Euromet and EURACHEM participate to the Contact Persons' meeting of «Metrology in Chemistry» (MetChem) on equal footing.

The EURACHEM Chairman provides a list of Contact Persons (one per country).<sup>1</sup> The Euromet Chairman provides a list of Contact Persons (one per country).<sup>1</sup>

The Euromet Rapporteur will chair the Contact Persons' meeting of MetChem.

Four expert groups have been defined as sub-fields: gas, organic, inorganic, and electrochemistry. For each sub-field a Convenor will be proposed by the MetChem Rapporteur and nominated by the Euromet Chairman.

## MetChem contact persons and sub-field convenors

In autumn last year, nomination of experts (contact persons) for the MetChem plenary and nomination of the sub-field convenors was completed.

The Metchem plenary is chaired by Eva Deak, OMH, Hungary, rapporteur of the former Euromet Amount of Substance subject field. Convenorship of working groups was divided between EURACHEM and Euromet as follows:

- Gas analysis: Peter Woods, United Kingdom (rep. Euromet)
- Inorganic analysis: Ralf Matschat, Germany (rep. EURACHEM)

## MetChem: Joint EURACHEM/Euromet Committee for Metrology in Chemistry Established

As mentioned in the last issue, EURACHEM and Euromet have agreed to establish a joint committee on metrology in chemistry, with equal participation, replacing the former Euromet Amount of Substance committee. The new committee, called **MetChem**, comprises a plenary and four expert groups on gas analysis, inorganic analysis, organic analysis and electrochemical analysis, thus mirroring the CCQM.

- Organic analysis: Maire Walsh, Ireland (rep. EURACHEM)
- Electrochemical analysis: Michal Mariassy, Slovak Republic (rep. Euromet)

Members of the MetChem plenary were nominated by national EURACHEM and Euromet organisations as follows:

Belgium: C. Deckers, Service de la Metrologie, Brussels (Euromet)

Czech Republic: Zbynek Plzak, Academy of Sciences of the Czech Republic, Prague (EURACHEM); Jan Tich, Czech Metrology Institute (Euromet)

Denmark: Bente A. Nyeland, National Environmental Research Institute, Roskilde (EURACHEM & Euromet)

EU JRC IRMM: Paul de Bievre, IRMM, Geel (Euromet); Philip Taylor, IRMM, Geel (EURACHEM)

Finland: Veikko Komppa, VTT, Espoo (EURACHEM & Euromet)

France: Alain Marschal, LNE, Paris (EURACHEM & Euromet)

Germany: Ralf Matschat, BAM, Berlin (EURACHEM); Wolfgang Richter, PTB, Braunschweig (Euromet)

Greece: Eugenia Lampi, General Chemical State Laboratory, Athens (Euromet)

Hungary: Eva Deak, OMH, Budapest (Euromet)

Ireland: Maire Walsh, State Laboratory, Dublin (EURACHEM & Euromet)

Italy: Maria G. Del Monte, National Centre for Reference Materials c/o CSM, Rome (EURACHEM); Margherita Plassa, IMG, Torino (Euromet)

The Netherlands: Ed W.B. de Leer, NMI Van Swinden Laboratorium, Delft (EURACHEM & Euromet)

Norway: Helge Kildal, Norwegian Metrology and Accreditation Service, Kjeller (Euromet)

Poland: Wladislaw Kozlowski, Central Office of Measures, Warsaw (Euromet)

Portugal: Isabel Castanheira, IPQ, Lisbon (Euromet)

Slovak Republic: Michal Mariassy, Slovak Institute of Metrology, Bratislava (Euromet)

Slovenia: Nineta Majcen, SMIS, Verification Office, Celje (Euromet)

Spain: Maria Teresa Lopez-Esteban, CEM, Madrid (Euromet)

Sweden: Ulf Oernemark, SP, Boras (Euromet)

Switzerland: Bernhard Niederhauser, OFMET, Bern (EURACHEM & Euromet)

Turkey: Ibrahim Akdag, TUBITAK-UME, Gebze-Kocaeli (EURACHEM); Fatma Sogut, TUBITAK-UME, Gebze-Kocaeli (Euromet)

United Kingdom: Mike Sargent, LGC, Teddington (EURACHEM); Peter Woods, NPL, Teddington (Euromet).

In addition, experts from Bulgaria, Romania and Russia were nominated in an observer capacity.

## MetChem work programme

As a consequence of the Arrangement on Mutual Recognition of National Measurement Standards and of Calibration and Measurement Certificates Issued by National Metrology Institutes drawn up by the International Committee of Weights and Measures (see BIPM Website, [www.bipm.fr](http://www.bipm.fr)) the national measurement institutes and national reference laboratories in the members states of the Meter Convention are currently compiling their calibration and measurement capabilities (CMCs) in the various measurement fields, among others in the field of chemical measurements, for publication in a database on the Internet. Before publication, these CMC claims will undergo an in-depth review within and between regional metrology organisations. For metrology in chemistry in Europe, EURACHEM and Euromet agreed to share this task. The main work item of Metchem working groups will therefore be the primary review of CMCs from NMIs in Europe, and the secondary review of CMCs from NMIs in other regions of the world.

Other work items will include inter-comparisons at the European level, studies of potentially primary methods, but also contributions to the revision of the VIM.

Werner Hässelbarth  
EURACHEM Secretariat

<sup>1</sup> The Euromet and EURACHEM Delegates are free to nominate together one and the same Contact Person for their country.



## Editorial

Back from my New Year's season holiday, I found my mail box full of emails with viruses attached, and my dotcom investments finally plunged down to purely symbolic penny prices.

Doubtlessly, EURACHEM started into the "real new" millennium in much better shape: A EURACHEM vision of the nineties, the introduction of metrology in chemistry now becomes reality, and EURACHEM will considerably contribute to conceiving both the form and the content of chemical metrology. The main outcome of EURACHEM experts' commitment and efforts - the Guides - are highly appreciated within the analytical community and much in demand. As much as 15 translations of five different Guides are available or under way, including such in Japanese, Arabic and Indonesian.

2001 will be the first year of EURACHEM membership fees. Thrilling to see how this will develop. Maybe EURACHEM will need a Code of Conduct, like EUROLAB has endorsed one in 2000?

Looking at our current contact details, you may think: "Oops, they did it again." Our constant electronic information source urgently needed revision and refreshment and will be relaunched under a new address. Effective from 15 February 2001, you will find all about EURACHEM at [www.eurachem.bam.de](http://www.eurachem.bam.de). For a while, a re-directing service will be installed at the former URL. Likewise, when calling our Secretary Werner Hässelbarth, from 1 February please dial +49 30 8104 1101.

Meanwhile, my virus scanner has cleaned up my mailbox, and the New Market is promising to regain prosperity. This all makes me quite optimistic for 2001!

The Editor

- continued from front page -

we decided to implement a quality system and in 1992 we received a formal accreditation as a test and research laboratory. One year later this accreditation was combined with a GLP compliance in a fully integrated quality system. I was especially interested in methods to guarantee quality in non-routine work and we even published some of our results.

Personally, I have always been highly committed to projects about quality in analytical chemistry, because correct decisions can only be made on correct data. The same holds for some aspects in my daily life. My major out of office activities are my family and my mountaineering activities. If you climb rock, you have to rely on the quality of the rope, your harness and the belay points. Only high quality is good enough. When I am in the Alps or somewhere else in the world, the material may become even more important because you now also have to protect yourself against the influences of bad weather and other objective dangers (stone fall, etc.). To reduce the subjective dangers (your own judgement errors) you have to be able to assess the capabilities of yourself and your climbing friends. Quality of relations is important there, because you have to trust each other under sometimes extreme conditions.

### *Why have you chosen to chair EURACHEM?*

It is something like a logical consequence from my interest in quality and the congruence between the interest areas coming from my job at NMI and the interests of EURACHEM. Also, I like challenges and becoming chairperson of EURACHEM is certainly a challenge to your personal life. But it is also very rewarding and I highly appreciate the support from the BAM secretariat, the other chairs and executive members and especially the contacts during the General

Assembly meeting. At those occasions, I always regret that I cannot do more. Of course, it also wouldn't be possible without the support of my colleagues in NMI.



Dr Ed W. B. de Leer  
(NMI Van Swinden Laboratorium BV Delft,  
The Netherlands)  
EURACHEM Chairman  
2000-2002:

### *"... a really challenging task..."*

*What is, in your opinion, the position of EURACHEM in European chemistry, European politics, and among sister organisations?*

Difficult question! I think that on the quality playground, we are one of the most influential organisations in Europe. Our guidance documents for the interpretation of quality standards such as EN 45001, have been highly appreciated by European laboratories seeking accreditation and the new revision of our guide "Quantifying Uncertainty in Analytical Measurement" is the leading document for laboratories that are implementing uncertainty evaluations in their quality systems. More than 10.000 hits on the EURACHEM Internet site each month speak for themselves. However, not everybody knows EURACHEM and a lot of work will still have to be done. Therefore, I am grateful for an invitation from the Divi-

sion of Analytical Chemistry of the Federation of European Chemical Societies, and I look forward to a possible co-operation. As a result, we have a good position in European politics and members of EURACHEM are represented in the high-level expert group in the EU. We contribute to the work of EA, ILAC and CEN, and we have now a very intense co-operation with Euromet. Our joint working group MetChem is doing important work in relation to the MRA of NMI's and I expect that the input from EURACHEM will help to extend the metrological principles about traceability and measurement uncertainty to a much wider area in chemical analysis. The co-operation with CITAC will help to bring those ideas to the global level. Finally, the co-operation with EUROLAB: We are two complementary organisations and the combination of more scientific and more management orientation works very fine.

*What are the tasks for EURACHEM in the near future, and on the long term?*

We just finished our EURACHEM 2005 Strategy Paper and we renewed our Memorandum of Understanding. I think that the goals as described in EURACHEM 2005 describe our short term activities very well. We will continue to develop supporting documents for the analytical chemistry community, such as a traceability guide, we will continue to organize workshops, we will cooperate with EA, EUROLAB and Euromet, etc.

In the long term, I think, and also hope, that the metrological principles are accepted in the whole area of analytical chemistry and that these principles become a standard part of the analytical curriculum at universities and technical schools. As soon as every analytical chemist knows and applies these principles, EURACHEM may say "Mission accomplished".



*The Chairman and keynote speakers at the joint Eurachem/EQALM workshop on proficiency testing. From left to right, Nick Boley (LGC) Manfred Golze (BAM), Keith Jewell (CCFRA), Jytte Molin Christensen (AMI), Adriaan van der Veen (NMi-VSL), Alan Squirrel (ILAC), Leopoldo Cortez (EA), Jean-Claude Libeer (IPH) and Paul De Bièvre (IRMM).*

## Proficiency Testing in Analytical Chemistry, Microbiology and Laboratory Medicine - Current Practice and Future Directions

A combined introductory session and training course was held on 24 September with the main objective to prepare the workshop participants for the later working group discussions. A Nordic team consisting of Irma Mäkinen (Finnish Environment Institute), Kirsten Byrialsen (National Institute of Occupational Health) Denmark, Khalid Saeed from the Norwegian Metrology and Accreditation Service, and Ulf Örnemark, SP Swedish National Testing and Research Institute summarised the development of, and collaboration around proficiency testing in the Nordic countries.

Ellen Van Berkel from Kiwa, Knowledge Centre for Water, Nature and Environment in the Netherlands provided insight into the Dutch experience from accreditation of PT schemes. Steve Ellison (LGC), UK summarised uncertainty in PT and how this could be used in evaluating participants' performance. Results from different interlaboratory comparisons were used to illustrate how uncertainty statements may affect the evaluation by Z-scores and  $E_n$  numbers.

Finally, Rainer Schmidt (Bayer AG), Germany reported on the outcome of some recently established "in-house" PT-schemes in a chemical business unit. Similarly to many other fields, the unexpectedly large spread between the laboratories in the first rounds had been very useful in the subsequent discussions on the quality of the routine analytical work, and

eventually on the conclusion about the quality of the products.

### Welcome Addresses

The Chairman, Mr Nick Boley (LGC) UK formally opened the workshop on 25 September. In the welcome addresses given by the Chairman, by Claes Bankvall (president of the host institute SP), Ed De Leer (EURACHEM Chair) and Ulf Örnemark (scientific/organising committee), the importance of co-operation and co-ordination between countries, regions and different scientific areas was raised.

Professor Bankvall pointed to the fact that the customer often has problems that will draw resources from different fields of competence, something which is now more and more experienced at the multidisciplinary national research institutes. This was exemplified by, e.g. looking at problems related to indoor environment, where expertise from building technology, analytical chemistry, microbiology and occupational health/laboratory medicine must be involved.

### Keynote Lectures

Eight invited speakers had been given the task to provide an overview of the current practice, problems and future directions of PT. Alan Squirrel (ILAC) and Leopoldo Cortez (EA) represented the international and the European accreditation bodies. In their respective talks, initiatives to formally recognise the com-

petence of PT providers and the achievements of the EA/EUROLAB/EURACHEM working group on PT were summarised.

Jytte Molin Christensen (National Institute of Occupational Health), Denmark gave a summary of the current practice in PT activities in occupational and environmental health. She pointed to the differences between the available schemes including matters concerning their relationship with legislation, national status, types and quality of proficiency testing material, analytical range and priorities for future development. The differences between PT schemes have been recognised at European level between organisers of PT and external quality assessment schemes (EQAS) why it seems appropriate to reinforce collaboration between organisers.

Starting from the point of view that "microorganisms are alive", Keith Jewell from the Campden & Chorleywood Food Research Association Group in UK got the audience's undivided attention when describing the difficulties in arranging microbiological PT. He concluded that the variability and uncertainty implicit in microbiological analysis requires a broader range of proficiency scheme providers providing a broader range of services than in chemistry and physics.

The long tradition of external quality assurance activities in medical laboratories was the starting point of the



summary given by Jean-Claude Libeer from the Scientific Institute of Public Health in Belgium. Most of today's routine tests are performed on dedicated analysers with commer-



*The working groups all had very lively debates and presented their findings in an entertaining and informative manner. Heidi Steensland, NKK, Norway was one of the Chairs of WG 4 dealing with general aspects of PT/EQA in laboratory medicine.*

cial sets of reagents (kits) for a huge amount of components. The pure analytical result (and the measurement uncertainty) does not give all the information needed for patient care. Dr Libeer stated that, in medical laboratories, the scope for the use of external quality programmes is usually broader than in other fields and he stressed especially the educational role. He concluded that whilst PT has a tendency to maintain the quality at a certain level and is unable to stimulate improvement, EQA in medical laboratories has evolved in most European countries to a powerful tool for improving quality of outcome.

Manfred Golze from the Federal Institute for Materials Research and Testing (BAM) in Germany presented the Internet database Eptis, which is the main outcome of the concerted action "Information System and Qualifying Criteria for Proficiency Testing Schemes". The database opened in March 2000 and currently contains comprehensive information on more than 640 PT schemes from sixteen European countries.

Two presentations addressed fundamental metrological issues. Paul De Bièvre from the Institute for Reference Materials and Measurements in Belgium focused his presentation on target values for uncertainty and how acceptability criteria in scientific fields are determined. Target values for uncertainty, i.e. a range around

the reference value within which any result from a participant in a PT scheme may be considered satisfactory can be useful but are, at present, not offered in most interlaboratory comparisons.

Adriaan van der Veen of the NMI van Swinden Laboratory (The Netherlands) emphasized that the publication of ISO/IEC 17025 imposes on all testing laboratories to meet - to a certain extent - the same requirements regarding

measurement uncertainty and traceability. Therefore, PT organisers should deal with these issues. Dr van der Veen revisited the establishment of assigned consensus values, and discussed the different cases when results were accompanied by credible uncertainty statements, with non-credible uncertainty statements and when there were no uncertainty statements. He concluded that uncertainty calculations in the testing area are no longer completely different from those in the calibration area.

There is a big task ahead for proficiency testing organisers in adapting to the new situation, but they can borrow a lot from existing techniques made available in comparisons in the calibration area. It will probably bring experimental measurement and uncertainty evaluation more closely and more consistently together, and will give a boost to the understanding of how measurement systems behave, and this will allow for more direct and better heading actions if method improvement is necessary.

### Working Group Discussions

The seven working groups (WGs) each contained a majority of participants with expertise in the subject being covered by that WG and a few

participants with a different expertise. This was done to promote cross-fertilisation of ideas between different subjects, a key objective of the workshop, and the participants appreciated the exchange. Each WG had a number of subjects to discuss, which, to some extent, reflected the content of the eight keynote lectures. Some of the subjects were covered by more than one WG, from different perspectives. Among the items discussed and summarised by the WGs were: the most important developments in the different fields the last five years, the impact of accreditation of PT providers on laboratories, what approaches to using uncertainty should be used in PT, and how PT fits in the overall structure of metrology in chemistry.



*The City of Borås' reception was held at the Swedish Museum of Textile History where participants were informed about the local university college's textile research. Various production steps were demonstrated using machines from the XIX and XX century.*

### Additional Information

A more extensive report on the workshop will appear in a special issue of *Accreditation and Quality Assurance* in April. The issue will contain the keynote lectures, a summary of the working group discussions and selected manuscripts submitted to the workshop by the participants.

EURACHEM has requested the workshop be followed up within 2½ years. No firm plans have been made, but we agree that the next event should be equally border crossing and build on the momentum and goodwill generated by the delegates.

Ulf Örnemark, EURACHEM Sweden, and Nick Boley, EURACHEM PT Mirror Group Chairman

# Strategy to Introduce the Concept of Measurement Uncertainty in Testing in Connection with the Introduction of the Standard ISO/IEC 17025

## Introduction

The knowledge of the measurement uncertainty of testing results is fundamentally important in order to understand the meaning of testing results by laboratories and their clients. Competent laboratories know the quality of their testing methods used and the uncertainty of the results. Measurement uncertainty is a very important quality feature of a result or a testing method. Other such features are reproducibility, repeatability, robustness and selectivity.

Clients should be able to draw optimum advantage from a laboratory's services. An accredited testing laboratory has worked out appropriate principles for its collaboration with the clients. Depending on the situation, clients are interested:

- in how reliable the results are and if they can be complemented by a statement about their uncertainty;
- in knowing with which certainty a conformity statement about the product can be made;
- if the test reports are factually correct, useful and comprehensive for the laboratory's clients.

The standard ISO/IEC 17025 provides detailed requirements concerning measurement uncertainty and how it should be stated in the testing reports.

### The standard ISO/IEC 17025

The standard ISO/IEC 17025 doesn't in principle include new requirements

concerning measurement uncertainty. It treats this subject more in detail than the previous standard. Point

Point 10.2 in the ISO/IEC Guide 25 prescribed that testing laboratories should apply suitable methods to define measurement uncertainty.

The introduction of ISO/IEC 17025 brings the challenge to implement the concept of measurement uncertainty (MU). This concept is not new for chemical testing laboratories, since the ISO/IEC Guide 25:1990 already required the use of appropriate procedures for MU estimation. However, in 1990 the MU concept may have been reasonably well developed in the area of calibration laboratories, but in the area of chemical testing laboratories it was more or less equivalent with the 95% confidence interval. The 90s lead to rapid developments in the MU concept and the EURACHEM/WELAC Guidance "Accreditation for Chemical Laboratories" already contained an extended chapter on MU. The publication of the ISO GUM further stimulated the application of MU to chemical testing. The first edition of the EURACHEM Uncertainty Guide was published shortly afterwards, and its 2<sup>nd</sup> edition (June 2000) gives a complete guidance to chemical laboratories for the evaluation of MU of chemical measurement results.

For an efficient implementation of MU, it is necessary that both the accreditation organisation EA and the laboratory community as represented by EUROLAB and EURACHEM, agree on a common strategy. This strategy was developed and discussed in the Permanent Liaison Group (PLG) of EA/EUROLAB/EURACHEM and the full draft version is published on these pages.

It must be made clear that this draft version is still under discussion. However, EURACHEM has already expressed a strong support for the rapid publication of this strategy document and the final approval from the EEE-organisations and possibly also from ILAC may be expected by mid 2001. The present EURACHEM comments focus on correct use of terms and definitions, avoid weakening of ISO/IEC 17025 clauses, unallowed variations in a test method, concern about over-optimism on completeness of existing data for MU analysis, MU for qualitative testing, and promotion of MU evaluation in CEN and ISO standards.

**The EURACHEM Executive committee welcomes comments from national EURACHEM organisations. You all are invited to contribute by sending your comments to the secretariat.**

Ed W.B. de Leer, EURACHEM Chair

The standard ISO/IEC 17025 is dedicating the measurement uncertainty its own chapter. It prescribes calibration or testing laboratories to have and apply methods for the estimation of measurement uncertainty. This standard also states that:

- it is not always necessary to use metrologically rigorous and statistically valid estimations;
- laboratories have to use appropriate methods of evaluation;
- all components being able to influence measurement uncertainty have to be considered, at least an attempt must be made;
- a reasonable estimation based on existing knowledge of the method shall be made;
- well-recognised methods specifying limits of the major sources of uncertainty require no special action from the laboratory
- acquired experience may serve as a basis;
- validation data can be used.

## Definitions

According to the International Vocabulary of Basic and General Terms in Metrology, measurement uncertainty is a parameter related to a quantitative testing characterising the range of values that with a certain probability still can be assigned to the result. This parameter could be a standard deviation or another part of an interval indicating a certain confidence range.

5.4.3. in EN 45001 required a statement about measurement uncertainty in the testing reports where relevant. Furthermore, this standard demanded laboratories to reject orders to execute tests according to methods endangering factual results or methods not giving intended reliability.

related to a quantitative testing characterising the range of values that with a certain probability still can be assigned to the result. This parameter could be a standard deviation or another part of an interval indicating a certain confidence range.

Measurement uncertainty embraces all components of a test. Some of them may be obtained by interpreting the statistical spread of results of a series of measurements. Other components have to be worked out from complementary methods (sampling plans, experience).

Testing results should be the best approximation to the real value. Statistical and systematic factors contribute to the measurement uncertainty of the testing results. If possible, the latter should be eliminated by using as for instance correction factors.

Some tests are purely qualitative. In these cases, measurement uncertainty relates to the estimation of the possibility of a false positive or a false negative statement.

### Factors contributing to measurement uncertainty

There are different sources to be considered possibly influencing measurement uncertainty (not all sources are relevant in all cases). Some source examples are given in the following:

- the definition of the measurand is incomplete;
- sampling (in statistical sampling for instance, AQL tables can be used);  
*Note: AQL (acceptable quality level) is the quality level connected to a given large probability of acceptance (ISO 2859, 3951, 3534).*
- transportation, storage and handling of samples;
- preparation of samples;
- environmental and measurement conditions;
- effect of the personnel executing tests;
- variations of the test procedure;
- influence by the measuring instruments (declarations of the calibration laboratory may be included);
- calibration standards or reference materials (declarations of calibration or testing laboratories are often available)
- software and/or, in general, methods associated with the measurement.

- uncertainty arising from correcting the measurement results for systematic error components.

### Policy of Eurolab, EURACHEM and EA on the implementation of uncertainties

Measurement uncertainty has to be taken into account when testing procedures and/or testing results are compared with each other or against specifications.

The understanding of measurement uncertainty is important in order to be able to choose testing methods that are fit for use. The measurement uncertainty should be in a realistic proportion to the given requirements. The economic aspects related to the methods have always to be taken into consideration.

Testing laboratories should report measurement uncertainty if it is important for the validity or the application of testing results. This should at least be the case where testing results have to be compared to other testing results or to other numerical values, such as for instance specifications and limiting requirements. In any case, the laboratories should have a knowledge of the uncertainties being connected to their measurements.

As a general rule, the implementation of the concept of measurement uncertainty should go in line with the implementation of ISO/IEC 17025.

The three organisations may agree on exceptions for such technical areas where measurement uncertainty is difficult to apply. EA, together with Eurolab and EURACHEM, will for such cases promote and support the development of guidance documents and examples by laboratory professionals.

Eurolab, EURACHEM and EA therefore consider that a statement on measurement uncertainty in testing reports where relevant and necessary will be common practice in the future.

The three organisations will, as a first step, concentrate on the introduction of measurement uncertainty for quantitative testing results.

### Strategy on implementation

Eurolab, EURACHEM and EA agree on the following fundamental points:

1. The statement of measurement uncertainty should contain sufficient information for comparative purposes.
2. The GUM forms the basic document but sector-specific interpretations may be needed.
3. Basis for the estimation of measurement uncertainty is the existing knowledge (no special scientific research should be required from the labs). Existing experimental data should be used (quality control charts, validation, round robin tests, PT, CRM etc.).
4. The basic requirements should be either an estimation of the overall uncertainty, or identification of the major components followed by an attempt at estimating their size.
5. The required depth of the uncertainty estimations may be different in different technical fields. Factors to be taken into account include:
  - i) Influence of the measurement uncertainty on the result (appropriateness of the determination)
  - ii) Appropriateness of the estimation
  - iii) Classification of the degree of rigour in the determination of measurement uncertainty
  - iv) Common sense
6. In certain cases it can be sufficient to report only the reproducibility.
7. Only measurement uncertainty in quantitative testing is considered for the time being. A strategy on the handling of results from qualitative testing has to be developed by the scientific community.
8. There should be no development of new guides where usable guides already exist.

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In September 2000, AOAC has held a very successful Annual Meeting in Philadelphia, USA. A full week was filled with AOAC training courses, focussed on Laboratory Accreditation and Quality Assurance for laboratories, committee meetings, Opening Ceremony and President's Reception, followed by three days of Symposia and exposition of 90 of the leading international providers of laboratory products and services. Current AOAC President is Michael Brodsky, Toronto, Canada.

A large number (811) of attendees from USA and countries all over the world attended this meeting. A training program for Section leaders illustrated the different problems faced by Sections in Europe, Asia and Latin America. All of us are interested in good validated methods of analysis, good reliable laboratory results, accreditation and related issues, and still the different cultures determine how the issues are discussed and what is needed in the region or country. A special welcome was made to the new AOAC China Section, which was set up in Beijing last March.

The 2001 AOAC Annual Meeting and Exposition will take place in Kansas City, Missouri, USA from 9 - 13 September. Keynote speaker will be FAO/WHO Codex Alimentarius

### 2000 Successful for AOAC

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Chair, Dr Tom Billy, Food Safety and Inspection Service, USDA/USA.

There is much interest in accreditation of laboratories in the world, and AOAC has developed a videotraining on the subject, that was first used in October for the Food and Drug Administration. More training products will be developed in this area.

The 17<sup>th</sup> Edition of the Official Methods of Analysis was issued in 2000 in print and on CD-ROM. Suggestions for producing special chapters of the book in separate editions are being considered. A new publication on CD-ROM is a compendium of methods for microbiology testing. This CD contains fully validated AOAC Official Methods of Analysis for microbiology, AOAC Research Institute Performance Tested test kits for microbiology and methods from UK and other sources, some of them validated to a lesser extent.

An interesting development is the route to harmonisation between ISO, CEN and AOAC INTERNATIONAL

on validation studies for microbiology in order to come to a harmonised protocol for the validation of these methods, and the mutual acceptance of these methods. Details outlining the statistical rationale for reducing the number of participating laboratories (from 15 to 10) will be published in the Journal of AOAC INTERNATIONAL.

AOAC continues to work on, and publish validated methods of analysis; in cooperation with CEN a number of methods was jointly studied and validated for natural toxins in food. The Official Methods of Analysis contains a large number of methods accepted by several international organisations.

Besides laboratory accreditation, proficiency testing and the use of validated methods form the corner stones for acceptance of analytical results. AOAC INTERNATIONAL will continue to strive for improving the quality of analytical measurements.

For more information, please consult the revised and renewed website at [www.AOAC.org](http://www.AOAC.org).

Margreet Lauwaars  
AOAC International Coordinator

### 5<sup>th</sup> EUROLAB Symposium discusses latest developments in testing

The 5<sup>th</sup> EUROLAB Symposium was held on 4<sup>th</sup> and 5<sup>th</sup> October 2000 in Edinburgh, with the invitation to the City Chambers and the Symposium Dinner at the Royal Museum of Scotland offering a worthy frame for EUROLAB's 10<sup>th</sup> anniversary.

The title: "Confidence in Testing Services – New expectations, new rules, new challenges" reflects the contents of the high quality lectures and vivid discussions. 140 participants from 22 countries, from the laboratory community, accreditors, authorities as well as from industry learnt about latest developments in the area of testing and conformity assessment and how to keep up with the market. Interesting discussions will stimulate future developments in the field of conformity assessment.

The final panel discussion on ISO/IEC 17025 offered the possibility to discuss problems encountered with the new standard and to put questions to an expert panel.

The new standard ISO/IEC 17025 "General requirements for the com-

petence of testing and calibration laboratories" plays a fundamental role in the laboratory sphere. On the one hand the new standard offers more flexibility and allows to report opinions and interpretation, but on the other hand specific requirements like measurement traceability and uncer-

### Confidence in Testing Services – New expectations, new rules, new challenges

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tainty mean additional tasks and higher costs for laboratories. In several lectures the participants learned about the new tasks for laboratories.

Third party testing provides a non-biased and impartial sight and thus great confidence in test results, fulfilling the most important requirements of professional judgement as Jarl Forstén, VTT, Finland, pointed out. According to the new standard

ISO/IEC 17025 the laboratory may give its interpretation and opinion. One of the improvements of ISO/IEC 17025 was the incorporation of ISO 9000:1994. But with ISO 9001/2:1994 now being revised as 9001:2000, the problem is that ISO/IEC 17025 is already out of date. So far no decisions have been taken for the procedure of a revision.

### New approaches for improvement of the accreditation procedure

Within a "flexible scope of accreditation" a laboratory may modify a method when using the measurement principles it is accredited for, without having to report to the accreditation body, still being accredited for the method. This is an improvement of the accreditation practice allowing the laboratory to quickly react to customer demands. The revision of the standards of the EN 45000 series offers the chance to improve the interface of the standards. The "functional approach" that was described by Bent Larsen, Denmark, defines the single functions of the standards: management description, testing, calibration,

- continued on the next page -



<b>March 2001</b>	<p><b>PITTCON 2001</b>  4 - 9 March (Exposition: 5 - 8 March), New Orleans, LA USA  The Pittsburgh Conference, 300 Penn Center Blvd., Pittsburgh, PA 15235  Tel +01 412 825 3220  Fax +01 412 825 3224  pittconinfo@pittcon.org  http://www.pittcon.org</p>
<b>April 2001</b>	<p><b>EURACHEM General Assembly</b>  (including Executive Committee and WG meetings)  18 - 21 April  Popowo/Warsaw, Poland  EURACHEM Secretariat  http://www.eurachem.bam.de</p>
<b>July 2001</b>	<p><b>IUPAC 41<sup>st</sup> General Assembly</b>  29 June - 8 July  Brisbane, Australia.  IUPAC Secretariat, Tel +1 919 485 8700,  Fax +1 919 485 8706  secretariat@iupac.org  www.iupac.org/symposia/conferences/ga01</p> <p><b>IUPAC 38<sup>th</sup> Congress/  World Chemistry Congress 2001</b>  1-6 July 2001, Brisbane, Australia.  Congress Secretariat  PO Box 177, Red Hill Q 4054, Australia  Tel. + 61 7 3368 2644  Fax + 61 7 3369 3731  wcc2001@ccm.com.au  www.ccm.com.au/wcc</p>
<b>August 2001</b>	<p><b>ANALYTICAL SCIENCES  International Congress on Analytical Sciences 2001 (ICAS2001)</b>  6-10 August, Tokyo, Japan.  Prof. Tsuguo Sawada,  Department of Applied Chemistry,  The University of Tokyo, 7-3-1 Hongo,  Bunkyo-ku, Tokyo 113-8656, Japan  Tel +81 3 5841 7236 ext. 7237  Fax +81 3 5841 6037  icas2001@laser.t.u-tokyo.ac.jp  http://wwwsoc.nacsis.ac.jp/jsac/icas2001/</p>
<b>September 2001</b>	<p><b>EUROFOODCHEM XI</b>  Biologically-active Phytochemicals in Food: Analysis, Metabolism, Bioavailability and Function  26-28 September,  Norwich Research Park, UK  Nicola Durkan, Royal Society of Chemistry, Burlington House, Piccadilly, London W1J 0BA, UK,  Tel +44 (0) 20 7437 8656  Fax +44 (0) 20 7734 1227  conferences@rsc.org  www.rsc.org/lap/confs/eurofoodchemxi.htm</p>
<b>October 2001</b>	<p><b>10<sup>th</sup> INTERNATIONAL METROLOGY CONGRESS</b>  "Du Laboratoire a l'Industrie"  22 - 25 October, St. Louis, France  General Secretariat: Sandrine Gazal,  Maison de l'Entreprise  429, rue de l'Industrie,  34966 Montpellier Cedex 2  Tel +33 (0) 4 67 06 20 36  Fax +33 (0) 4 67 06 20 35  sandrine.gazal@wanadoo.fr  http://www.metrologie2001.com</p>
<b>November 2001</b>	<p><b>EURACHEM/EUROLAB Workshop on Sampling</b>  5 - 6 November, Lisbon  EURACHEM Secretariat  http://www.eurachem.bam.de</p>

- "5<sup>th</sup> EUROLAB Symposium..." continued from page 8 -

observation, auditing, evaluating, reporting and certification. The single functions could be included in one accreditation assessment. A multiple accreditation of testing, inspection and certification, could hereby be carried out in one operation without double-assessment of the functions that are part of several areas. Facilitating the procedure would also make accreditation cheaper and enable it to adapt to changes more rapidly.

### Economic effects of accreditation

The preliminary result of a PhD study on the satisfaction of German laboratories with the benefits from accreditation was presented. Laboratories had expected an improvement of their quality management systems and recognition by the market and the clients. After the accreditation most expectations were not fully met, some participants of the inquiry were even faced with competition disadvantages because of their higher prices compared to non-accredited laboratories. However, more than 80% of the participants are planning to renew their accreditation.

### Proficiency testing

Proficiency testing and interlaboratory comparisons are a valuable tool in quality management for the laboratory itself and for the accreditation body. However, it is costly and time consuming. Therefore accreditation bodies should not make proficiency testing mandatory but see it as one possibility in conformity assessment. Nordtest/Force Institute gave an example of how participation in proficiency testing can be optimised by grouping methods and by using a flexible scope of accreditation. Information on Proficiency Testing Schemes (PTS) is available free of charge on the internet by EPTIS (EUROPEAN Information System on Proficiency Testing Schemes at www.eptis.bam.de - see *Newsletter No 18*).

### Management and customer satisfaction

Recognising the significance of meeting customer demands and of the management system were further issues of the symposium. With competition getting harder, customer satisfaction plays an increasingly important role in the testing market. The approach of LNE, Laboratoire National d'Essais, Paris, to evaluate client satisfaction was presented. LNE carries out customer surveys via telephone targeting at customers needs, improvement of the internal strategy and benchmarking with the main competitors.

Another important tool for a company's planning process are management reviews - on which ISO/IEC 17025 provides detailed requirements. As an example Georg Spescha, Switzerland, introduced the concept of management reviews at EMPA. Liability issues are also an important and delicate matter for laboratories.

### Significance of conformity assessment in transatlantic business

Andreas Julin from the European Commission, Directorate General for Trade, discussed the developments in transatlantic business. The objective in conformity assessment activities is to facilitate trade by reducing costs e.g. by avoiding duplicate measurements and by mutual recognition of calibration and measurement certificates.

The message of the symposium can be summarised as:

- Accreditation must be harmonised. It is important that ISO/IEC 17025 will internationally be implemented in the very same manner. This is also a chance for facilitating international trade.
- Accreditation is expensive. Accreditation must be flexible to accept changes rapidly. Continuous improvement must also take customers' demands into account.

Anita Schmidt, EUROLAB Technical Secretariat

## EURACHEM Liaison with ILAC: A Closer Look

The International Laboratory Accreditation Cooperation (ILAC) is a network of accreditation bodies, regional cooperations and stakeholders. EURACHEM is a stakeholder member of ILAC and a member of its Laboratory Liaison Committee (LLC). ILAC has several other committees including, Accreditation Policy Committee (APC), the Technical Accreditation Issues Committee (TAIC) and the Public Affairs Committee (PAC).

### ILAC Mutual Recognition Arrangement

The ILAC General Assembly (GA) meets on an annual basis and the highlight of the 2000 meeting chaired by Dr. B. Collins, ILAC chair was the ceremonial signing on Thursday November 2nd of the ILAC Mutual Recognition Arrangement (Arrangement). The signatories to the Arrangement were IMETRO (Brazil), SANAS (South Africa) and representatives from EA and APLAC member economies who were present at the meeting.

A total of 36 accreditation bodies signed the Arrangement, of which 18 were from Europe.

The Arrangement was the culmination of many years of planning and hard work and it represents a major step forward in the attainment of the objective "once tested everywhere accepted". Its relevance for EURACHEM members is heightened when we consider that within Europe we have the Single Market and the world that we are living in is rapidly becoming a global village. A village where people, goods and services including analytical data cross borders on a daily basis and global trade must conform to the prescripts of the WTO.

One of the key strategies in ensuring the operability of life in this global village is the acceptance of the philosophy "once tested everywhere accepted". Laboratory accreditation has a key role to play in the attainment of this strategy and the ILAC Arrangement is the critical success factor.

### Topics & Decisions

The GA was preceded by the biennial Technical Conference, which included the following topics, ISO/IEC 17025, PT and interlaboratory comparisons, uncertainty and traceability.

The main business of ILAC is conducted at the GA and the major decisions taken include:

- Expansion of the membership to include the National Laboratories Accreditation Bureau (Egypt) and the Tunisian Accreditation Council as Full Members, and the General Directorate of Standardisation (Albania), Jordan Institute for Standards and Metrology, National Centre for Accreditation of Kazakhstan, Mauritius Accreditation Service and The National Council of Science and Technology (El Salvador) as Associate Members.
- ILAC will seek incorporation as a legal entity in the Netherlands and the Executive Committee and the Secretariat were mandated to pursue this objective and to finalise the drafting of the current draft articles of association, the latter were discussed at the GA.
- NATA (Australia) will provide the secretariat for a further term of two years
- ILAC and IAF will explore areas of common interest including the organisation of their annual meetings in tandem with one another.
- Mr Daniel Pierre (COFRAC) was elected ILAC vice chair.
- Dr Belinda Collins (NVLAB) having completed her term of office as ILAC Chair handed over to the vice-chair Mr Mike Peet (SANAS).

### Working Groups

Most of the work of ILAC is done through the working groups under the aegis of, the APC, the TAIC and the PAC. The TAIC committee is the most relevant for EURACHEM members and it is subdivided into the following working groups: Traceability, Forensic Laboratories, EMC, Surveillance and Re-assessment, Scope of Accreditation, Calibration Intervals, Uncertainty of Measurement in Calibration, Grading of Non-Conformances, Internal Audits and Management Reviews, ISO/IEC 17025 opinions and interpretations, PT, RM, Uncertainty of Measurement in Testing, Horse Racing Laboratories and Inspection and cooperation with IAF.

In the past year the following documents were adopted:

- ILAC-G12:2000 Guidelines for the Requirements for the Com-

petence of Reference Material Producers

- ILAC-G13:2000 Guidelines for the Competence of Providers of Proficiency Testing Schemes

### The Laboratory Liaison Committee

Membership of the LLC is important for EURACHEM members as it affords them with the opportunity to comment on ILAC draft documents and to input into ILAC committees and working groups.

The LLC met before the ILAC GA and the following decisions were taken at that meeting and subsequently endorsed by the GA:

- The election of Mr. David Stanger, representing UILL, as Chair of the Laboratory Liaison Committee; of Dr. Norbert Muller, representing Eurolab, as Vice Chair; and the appointment of Dr. Maire Walsh as the LLC observer to the ILAC MRA Arrangement Management Committee.
- To levy a subscription fee to members of the LLC of €750 per year for 2 years as a contribution to the administration of the committee
- The resolution of the LLC to support the completion of an introduction to ISO/IEC 17025 prepared by Ms Lynne Neumann
- The resolution of the LLC to recognise that the LLC will, without delay, review the work program of the other ILAC committees and within available resources actively contribute to their top priority working groups.

Draft documents sent to the LLC for comment during the past year included the ILAC Guidelines for Forensic Science Laboratories, several drafts of Guidance to Accreditation to ISO/IEC 17025, and The Scope of Accreditation and Consideration of Methods and Criteria for the Assessment of the Scope in Testing.

The above were circulated to all EURACHEM GA members for comment and this is an unique opportunity for the laboratory community to input into the work of ILAC.

Maire Walsh, EURACHEM Ireland, EURACHEM representative to ILAC Laboratory Liaison Committee (LLC)

## New Associated Member: Ukraine

EURACHEM Ukraine has been established in November 1999 and develops its activities in accordance with the general EURACHEM Aims and Objectives. In particular, work has been started on the creation of national network for proficiency testing by interlaboratory comparisons in compliance with ISO/IEC Guide 43-1, 2 and ISO/IEC 17025. Based upon these documents, national "Instructions on the Procedures for Testing of Measuring Laboratories" have been worked out. The Ukrainian Centre for Standardisation, Metrology and Certification (UkrCSM), having the status of the National Scientific Metrological Centre and basic organisation in the field of physico-chemical measurements, approved a number of institutions as the coordinators of proficiency testing schemes. Among them are the General State Ecological Inspection Board and several institutes of the National Academy of Sciences.

Another topic in EURACHEM Ukraine's activities will be the implementation of internationally recognised documents, including EURACHEM guides, on analytical measurements traceability, measurement uncertainty evaluation, use of reference materials, and accreditation for chemical laboratories.

In May 2000, the EURACHEM General Assembly accepted Ukraine's application for associate membership. Ukrainian nominated representatives to the EURACHEM Committee are Dr. M. Rozhnov and Dr. M. Prodanchuk.



Dr Michael Rozhnov is Head of the Department for Physico-Chemical Measurements of the UkrCSM, Head of the Ukrainian technical committee on standardisation "Analysis of gases, liquids and solids", and a member of editorial board of the "Ukrainian metrological magazine". Dr Rozhnov is also active in international standardisation (ISO/TC 158 "Analysis of gases" and ISO/TC 193 "Natural gas").

Scientific experience: chemical metrology, physical chemistry; reference materials, and gas analysis, including properties of gases and measurement traceability.

The participation in EURACHEM will help the Ukraine to improve the quality of analytical measurements and make its own contributions to international efforts in this area.

Michael Rozhnov, EURACHEM Ukraine



Dr Mykola Prodanchuk is Director of the Institute of Ecology and Toxicology. He possesses diplomas of Doctor of Medicine (PhD), Doctor of Medical Science, Hygiene & Public Health, and Professor of Hygiene.

Scientific experience: internal medicine and surgery, toxicology, and public health.

Dr. Prodanchuk represents the Ukraine as a WHO expert in Public Health & Health Care Management. He is an expert-toxicologist for UNEP for Persistent Organic Pollutants, and the Research Head of Ukrainian-American Medical Ecological Project.

## Introducing EURACHEM Romania

EURACHEM Romania was born on 19 October 1999 as a result of a joint activity involving representatives from several organisations interested to promote quality in analytical measurement in Romania. After the representatives from universities, environmental organisations, interested private institutions, public health and the National Institute of Metrology agreed on the principles included in the Memorandum of Understanding of EURACHEM Romania, the entire framework of the association was established on 21 April 2000, and in June of the same year, EURACHEM Romania was legally registered in Romania as a non-governmental, non-profit and apolitical association.

The aim of EURACHEM Romania is to provide a forum for national laboratories and other organisations and individual experts interested in promoting the adoption of common principles of valid analytical measurement and in co-operation to achieve mutual acceptance of test results.

The issues of interest are addressed by four Working Groups organised, i.e. "Training & Education", "Promoting Quality Issues in Analytical Laboratories", "Traceability, Measurement Uncertainty and Reference Materials", and "Proficiency Testing".

The Romanian representatives to the General Assembly of EURACHEM are Prof Dr Constantin Luca and Dr Mirella Buzoianu.

### Prof Dr Constantin Luca's

career has been based solely in the field of analytical chemistry. He graduated at the University of Bucharest in 1954 and made his PhD in Analytical Chemistry at the same university. In 1977, Prof Luca became director of the Physico-Chemical Institute of the Romanian Academy (till 1990) and Head of the Department of Analytical Chemistry and Instrumental Analysis of the Faculty of Industrial Chemistry at the Polytechnic University of Bucharest (till present).

Prof Luca also participates in several national and international organisations, such as the DAC/IUPAC (1980-1991), the American Chemical Society, Société Française de Chimie, and the Romanian Chemical Society.

Up to the date, Prof Dr Luca has published more than 250 papers and 18 books on analytical chemistry, supramolecular chemistry, and membrane processing.

In 2000, he took over EURACHEM Romania chairmanship.

Although good progress has been made, many technical problems remain to be solved. The contribution of those who have devoted so much effort in supporting EURACHEM Romania will foster the developments achieved so far.

Constantin Luca, EURACHEM Romania

### Dr Mirella Buzoianu

is the executive vice-president and the secretary of EURACHEM Romania. From the very beginning, she became the main person of contact.

Since 1982, Dr Buzoianu has been working in the Romanian National Institute of Metrology in the Reference Materials Group.

Her scientific activities are focused on the development of traceability and measurement uncertainty as well as on implementing the principles of the production and use of different reference materials in analytical measurement, with a special interest in spectrochemical analyses.

Up to the date, Dr Buzoianu has published over 20 papers and presented more than 50 oral and poster contributions, invited and plenary lectures on the above topics.



## EURACHEM/CITAC Guide Available in Swedish

The EURACHEM/CITAC Guide "Quantifying Uncertainty in Analytical Measurement", 2<sup>nd</sup> Ed., is available in printed form in Swedish. The decision to translate the Guide was taken by EURACHEM Sweden already in the beginning of 1999. At that time, the Swedish accreditation body (SWEDAC) had just issued a policy document on measurement uncertainty. The policy stated that accredited laboratories should evaluate uncertainty according to the new international guidelines, e.g. those from ISO, EURACHEM and EA. The work with implementing the new concepts should be done by the end of 2000.

So far, Swedish laboratories had reported uncertainties mainly based on observed variation in control

charts, i.e. an intermediate precision.

The release of the Swedish version end of August was possible only due to an extensive communication with the EURACHEM Uncertainty WG. By the end of the year, around 500 copies had been distributed. So far the Guide has been used in education internally at SP, in a training course for technical assessors and in two courses with participants mainly from water and industrial laboratories.

Our, although limited, experience shows that the Guide can be used fairly easy when laboratories evaluate uncertainty from standardised Swedish methods. Those methods are often very detailed and contain large fragments that can be redistributed to comply with Steps 1-4 in the "process". We noted however that in many cases, the mathematical expression given in standards must be extended to enable correction for uncertainties associated

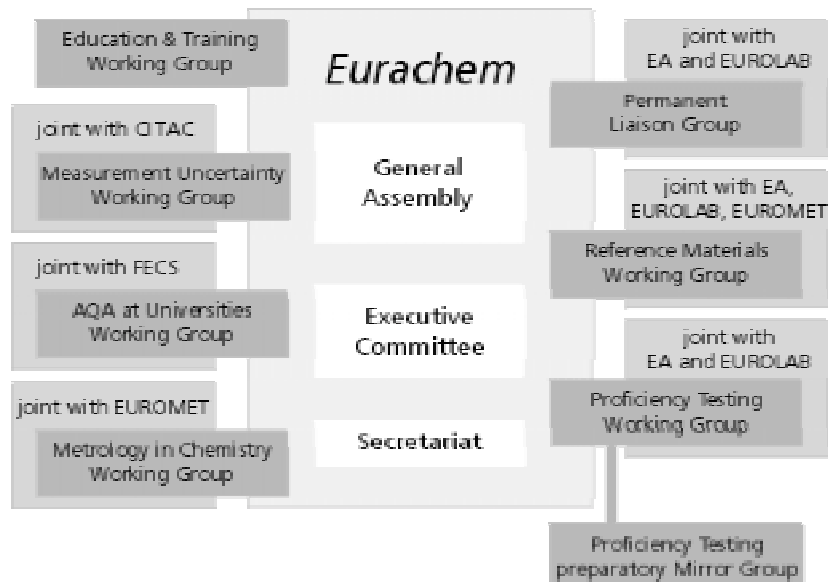
with sampling and sample preparation.

The most difficult part for the participants is still associated with mathematics and uncertainty propagation. Because control charts are very much used in Swedish laboratories, it is important that information from such can be used when uncertainty is evaluated. The concept demonstrated in the Guide for using cumulative precision components in the cause-and-effect diagrams will hence be very useful.

The Swedish Guide is available from SP as SP Report 2000:17, ISBN 91-7848-782-X.

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### Member countries:

Austria, Belgium, Cyprus, Czech Republic, Denmark, European Commission, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxemburg, Malta, The Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, and United Kingdom.

### Associate member countries:

Albania, Russian Federation, and Ukraine.

EURACHEM has interfaces with AOAC, CCQM, CITAC, EA, EUROLAB, EUROM II, EUROMET, FECS, ILAC, ISO/REMCO, and IUPAC. A complete list of all contact points for both EURACHEM activities and partner/liason organisations can be found on the EURACHEM web site at <http://www.eurachem.bam.de>