

EURAMET Newsletter

By EURAMET Chairman



A 'symphony of excellence' might also be applied to EURAMET cooperation, explains EURAMET Chairperson, Leslie Pendrill.

Cooperation amongst national metrology institutes and designated institutes in regional metrology organisations such as EURAMET [www.euramet.org] deals with all their fields of activity – from metrological research to the provision of calibration services – in response to increased needs of society for traceable measurement.

A special report, entitled "Symphony of Excellence", was published in a recent issue of the EU Commission's magazine "research*eu" [no.61 – July 2009]. In addition to the interesting articles mentioned there, could the same symphonic title also fit EURAMET's activities?

Can one find answers to questions such as:

- The best way of collaborating in research? This is a task actually very much in focus this autumn as potential collaborators meet to formulate their proposals in response to the first call 'Metrology for Energy' of the new Article 169 European Metrology Research Programme – see separate article in this newsletter
- How much redundancy is worthwhile in the provision of metrological traceability services where several national metrology institutes maintain what appear to be duplicate resources?

A possible answer might be found in the old adage about Schubert's 'Unfinished Symphony' had he used modern quality assurance methods:

1. For a considerable period, the oboe players had nothing to do. Their number should be reduced, and their work spread over the whole orchestra, thus avoiding peaks of inactivity.
2. All twelve violins were playing identical notes. This seems unnecessary duplication, and the staff of this section should be drastically cut.
3. Much effort was involved in playing the demi-semiquavers. This seems an excessive refinement, and it is recommended that all notes should be rounded up to the nearest semiquaver. If this were done, it would be possible to use trainees instead of craftsmen.
4. No useful purpose is served by repeating with horns the passage that has already been handled by the strings. If all such redundant passages were eliminated, the concert could be reduced from two hours to twenty minutes.

Whether EURAMET is such an orchestra remains to be seen, but it is sure that our members together do compose a Symphony of Excellence!



EURAMET appoint Quality Manager

EURAMET is pleased to announce the appointment of Dr Enver Sadıkoğlu, Ulusal Metroloji Enstitüsü (UME), as EURAMET's first Quality Manager. Enver undertakes the role on secondment from UME for a portion of his time. He will have responsibility for the initial full implementation of the EURAMET Quality Management System, the improvement and development of the system and the management of the internal auditing processes.

EURAMET expresses its gratitude to UME for facilitating the secondment of Dr. Sadıkoğlu.



EURAMET General Assembly 2009

The 2009 General Assembly was held in San Anton, Malta on 8th to 10th June 2009, hosted by the Malta Standards Authority (MSA). The meeting addressed some significant challenges facing EURAMET, with an expanding membership and increased activities in, amongst others, research and support to infrastructures in metrology. Some members of the Board of Directors were re-elected, new Technical Committee Chairs were appointed and the 2010 budget was approved. Strategic matters discussed included increasing the visibility of metrology in conformity assessment.

Co-decision finalised for the EMRP

Following signature by the European Parliament and the Council, the Co-decision process is now finalised for the EMRP. The Decision (No 912/2009/EC) was published in the Official Journal of the European Union on the 30th September 2009.

With the Co-decision in place, the development of the EMRP remains on track. Anticipating success and following the successful call for potential research topics for the energy sector launched in May this year. The second stage, a call for Joint Research Projects was launched in early September, and is open until early November 2009, see:

<http://www.emrponline.eu/energycall/>



EURAMET's participation in ICM and NCSLI metrology congresses

EURAMET had significant participation in two international metrology congresses during 2009. The 14th International Congress of Metrology – ICM 2009 (22 – 25 June in Paris) and the NCSLI Symposium (26 – 30 July in San Antonio, Texas) are the foremost metrology conferences in Europe and North America and EURAMET contributed with a large number of presentations and a booth in the industrial exhibition. One of the highlights of the ICM 2009 was the session on “Metrology and Health” with 6 excellent presentations on the iMERA-Plus TP 2 on Health. Also at the NCSLI EURAMET had an “own” session where the general strategy of EURAMET was presented as well as an update on recent progress in the “A-169 EMRP” and the cooperation in the development of national metrology infrastructures.



www.cfmetrologie.com

EURAMET Research Projects

Under the framework of the EMRP iMERAPlus, EURAMET has over 20 joint research projects running from nanotechnology, cancer therapy and high precise length measurements to the re-definition of the kilogram. The following are two examples of projects in operation.

EURAMET JRP Project T1 J1.2 (NAh)

Avogadro and molar Planck constants for the redefinition of the kilogram

The project aims to realize a kilogram on the basis of the mass of an atom. The idea is to assemble a known number of ^{28}Si atoms into a kilogram prototype. Together with Planck constant determination via the watt realization and the measurement of an atomic mass in terms of frequency, it provides the closure of a metrological triangle linking atomic and macroscopic masses.

The project is subdivided into two threads. One is a part of cooperation between the Institut Laue-Langevin (ILL), INRIM, and PTB for the measurement of $N_A h$ via absolute nuclear spectroscopy. The other will contribute to an international cooperation agreement (National Metrology Institute of Japan – NMIJ, National Metrology Institute of Australia – NMIA, Bureau International des Poids et Mesures – BIPM, INRIM, IRMM, and PTB) to determine N_A by counting the atoms in a

kilogram prototype made as a nearly perfect ^{28}Si sphere, from measurements of unit-cell and molar volumes.

Isotope enrichment and crystal production were completed in 2007 and a 4.5 kg crystal with a ^{28}Si enrichment higher than 99.99% was made available for measurements. In April 2008, the National Metrology Institute of Australia polished and handed over to the International Avogadro Coordination two ^{28}Si spheres (AVO28-S5 and AVO28-S8), with a mass very near to 1 kg. First mass, volume, and molar mass measurements have been completed, which demonstrated the expected $10^{-8} N_A$ resolution, but also, at the new sensitivity level, inconsistencies pointing to not yet really understood aspects of the relevant measurement technologies. After prototyping and demonstration of measurement capabilities over centimetre

displacements, the manufacturing of the x-ray interferometer crystals for the measurement of the unit-cell volume has been completed and a first measurement value of the unit-cell volume – and, consequently, a preliminary overall determination of the Avogadro constant – is expected by the end this year.

For more details contact:
Dr. Giovanni Mana
Istituto Nazionale di Ricerca Metrologica
Tel.: +39 0113919728
E-mail: g.mana@inrim.it



JRP Summary for Project T4 J01 (Power & Energy)

The Next generation of power and energy measuring techniques

Society demands electricity supplies that are secure, sustainable and of high quality. In the next decade, Europe is facing potential energy shortages as oil and gas supplies run down and nuclear power facilities age. Pressure to reduce the green house gas emissions will lead to a requirement for more renewable energy generation, efficient appliances, energy management and improved electricity distribution efficiencies. Commerce will demand an electricity supply of the highest quality, free from momentary voltage interruptions or interference sources. In the first 9 months of this project we have begun the process of designing and developing the necessary infrastructure to enable the measurement of the complex electrical parameters associated with power, energy and power quality to ensure that technologists, energy suppliers and regulators can work towards an energy secure future within a metrology framework.

To achieve this framework the project will undertake the following research and development:

- Design and build metrology grade digitisation hardware suitable for laboratory and on-site use suitable for measurement of signals ranging from three phase power to transients and impulses.
- Develop and characterize precision transducers for laboratory measurements of power and power quality.
- Formulate accurate sampling techniques and analysis algorithms in support of power quality including asynchronous sampling and noise reduction algorithms.
- Develop and characterize high current and high voltage transducers for non invasive use on the high voltage grid.
- Apply of this new technology within a harmonised methodology for the traceable measurement of power quality parameters in the laboratory and on-site.

To ensure exploitation and assure a timely and smooth take-up of the outcomes of this project, a "User Committee" consisting of 15 representatives of electricity suppliers, generation/distribution equipment manufacturers, legislation bodies and end-users will monitor the progress of the project suggesting approaches and methodologies that will ensure that the project has real impact in their industrial sectors.

Working together with this committee, the project will develop and disseminate a metrology infrastructure consisting of equipment designs, algorithms, procedures and techniques that will enable the measurement of Power Quality parameters under realistic conditions and develop on-site capabilities that provide traceable measurements on fixed power grid installations.

For more information contact: Dr. Paul Wright, National Physical Laboratory (UK).

Tel.: +44 (0)208 943 6367 E-mail: paul.wright@npl.co.uk

JRP website address: http://projects.npl.co.uk/power_energy/

EURAMET publishes new Calibration Guide

EURAMET is pleased to announce the publication of a new calibration guide. The Guide on the determination of uncertainty in gravimetric volume calibration was developed by the EURAMET Technical Committee for Flow and can be downloaded from <http://www.euramet.org/index.php?id=calibration-guides>



EMRP Article 169 Metrology for Energy 2009

Stage 2 – Call for JRP Proposals and REG Proposals now closed

NML-Ireland transfers from Enterprise Ireland to NSAI

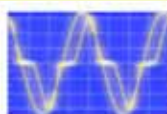
The National Metrology Laboratory for Ireland (NML) transferred from being a Division of Enterprise Ireland to become a Division of the National Standards Authority of Ireland (NSAI) in June 2009. As Ireland's Official standards body, NSAI aims to inspire consumer confidence and create the infrastructure for products and services to be recognized and relied on, all over the world. NSAI do this by developing standards; issuing certification; monitoring and regulating metrology; and approving new materials and processes for Ireland's construction industry. NML remain at the same location in Dublin and the EURAMET Contact Persons are unchanged.



**Renewable
Energy
Performance**



**Transmission
& Distribution
Efficiency**



**Power
Quality
Compliance**



**Energy
Saving
Evaluation**



**Accurate
Electricity
Metering**



NSAI

National Metrology Laboratory

EURAMET assistance in Development of Metrology in Republic of Macedonia

Imagine that your eyes catch the Sun at the solstice and equinox through the aged markers of stone that make the world's fourth Ancient Observatory Site – Kokino (North Macedonia, near Skopje) Megalithic Observatory (1815 B.C.). Metrology in the Republic of Macedonia has a long and enduring tradition. The historical artifacts indicate existing organized measurement activities during the Ottoman Empire in 13th century.

Today Macedonian metrology is led by the Bureau of Metrology (BoM), with the main task to realize, maintain and disseminate the SI units of the national measurement standards. In 2006, Republic of Macedonia joined the Metre Convention and 2007 BoM signed CIPM-MRA.

With the assistance of EU project CARDS/SMAQVa in 2004, Bureau of Metrology has grown to become a modern institution, with a laboratory building of almost 2000m². The focus of this project was to support the development of industrial/scientific metrology in Republic of Macedonia.

Inter-laboratory comparison organized through EURAMET TC-IM Focus Group on Facilitating National Metrology Infrastructure Development adds the missing link needed for assessment of equivalence of our national standards.

In 2008, the mass calibration laboratory participated in EURAMET project N° 1096 on the comparison of mass standards of 1kg and submultiples of the kilogram.

This year the mass calibration laboratory participated in the EURAMET project N° 1120 "Comparison of mass standards for SEE". This key comparison is proposed to act as a follow-up to the EURAMET 445 and will be linked to both EUROMET.M.M-K4 and EUROMET.M.M-K2 via BEV and EIM.

The Mass calibration laboratory will participate in presentation of its Quality System, in EURAMET TC-Q, in the future.

The next step for BoM is the preparation of CMCs for the laboratory as well as undertaking a research project on realization of a second level watt balance, using existing mass comparators.

Congratulations to Kamal Hossain and Andy Henson of NPL, UK



Kamal Hossain, a member of the EURAMET Board and a member of the EMRP Committee, has recently been awarded an Honour, **OBE** by the Queen for services to industry.

Kamal is recognized internationally for his work on improving links between research, standards and innovation, particularly for new technologies. From his influential position at NPL he has forged strong working partnerships with UK industry, the international standards community and academia as well as initiating very successful dissemination and technology transfer activities. He has played a leading role in developing NPL's work related to advanced technologies with substantial benefits to the UK. Kamal is Director of Research and International AT NPL, UK



Andy Henson, the EMRP Programme Manager, was awarded an Honour, **MBE** by the Queen for services to measurement science.

Andy has played a central role to transform European metrology, bringing into being his vision of a collaborative research community. By using his extensive knowledge and applying considerable drive, determination and influencing skills, he has created and steered Framework projects directly resulting in the establishment of a European Metrology Research Programme and the injection of millions of Euros of European funding into a neglected area of research.

BIPM Marks 10 years of CIPM MRA



The CIPM MRA was signed in October 1999 by the directors of 38 national metrology institutes and representatives of two international organizations. Today almost 200 such institutes participate. It has made a major contribution to improving the world metrology system and has achieved one of the original objectives, namely to reduce technical barriers to trade. Over the last ten years it has evolved steadily from covering the world measurement system in physics and engineering and now tackles the areas of metrology in chemistry; in the future it will include applications in fields as diverse as sports drug testing, environmental and climate studies and hospital medicine.

An event to mark the 10th anniversary of the MRA was held at the World Organization for Animal Health (OIE) in Paris on 8-9 October 2009 last.

The aim was to bring together government officials concerned with measurements in trade, representatives from intergovernmental organizations and international bodies whose missions benefit from the global uniformity and international acceptance of measurements, and representatives from industry.

Current Technical Committee Chairs including those elected during 2009

TC-AUV:	Salvador Barrera-Figueroa, DANIAMet-DFM, Denmark sbf@dfm.dtu.dk
TC-EM:	Beat Jeckelmann, METAS, CH beat.jeckelmann@metas.ch
TC-F:	Richard Paton, NEL, UK rpaton@tuvnel.com
TC-IM:	Attilio Sacconi, INRIM, Italy a.sacconi@inrim.it
TC-IR:	Hans Bjerke, NRPA, Norway hans.bjerke@nrpa.no
TC-L:	Michael Matus, BEV, Austria michael.matus@bev.gv.at
TC-M:	Walter Bich, INRIM, Italy w.bich@inrim.it
TC-MC:	Bernd Güttler, PTB, Germany bernd.guettler@ptb.de
TC-PR:	Peter Blattner, METAS, Switzerland peter.blattner@metas.ch
TC-Q:	Pavel Klenovsky, CMI, Czech Republic pklenovsky@cmi.cz (<i>Acting TC-Q Chair</i>)
TC-T:	Wolfgang Buck, PTB, Germany wolfgang.buck@ptb.de
TC-TF:	Andreas Bauch, PTB, Germany andreas.bauch@ptb.de

EURAMET Chairperson and Secretariat

EURAMET Chairperson: *Prof. Leslie Pendrill*, SP Technical Research Institute of Sweden, SE-50115 Borås, P.O. Box 857, Sweden. Phone: +46 10 5165444 / mobile: +46 76 7885444 E-Mail: chairperson@euramet.org

EURAMET Secretariat: *Wolfgang Schmid*, EURAMET e.V. Bundesallee 100, 38116 Braunschweig, Germany. Phone: +49 531 592 1960 Fax: +49 531 592 1969 E-Mail: secretariat@euramet.org

Edited by Paul Hetherington, NML Ireland. Tel: +353 1 8082604 E-Mail: paul.hetherington@nsai.ie