European Metrology Programme for Innovation and Research

Standardisation – Projects (Call 2017)

An overview of the set of projects funded under the Targeted Programme Pre- and Co-Normative research.

The aim of these projects is to develop metrological methods and techniques required for standardisation.

Focus is placed on both the specific documented demands of European and international Standards Developing Organisations (SDOs) and with a potential for high impact on European standardisation.

EURAMET e.V. - the European Association of National Metrology Institutes

Saving energy with efficiency

Improving the efficiency of grid power transformers and reactors

By 2020 the EU aims to reduce its CO_2 emissions by 20 %. Improving the performance of devices that deal with large amounts of energy could significantly contribute to this goal, as even small increases in efficiency can lead to substantial reductions in energy waste. Estimates suggest, for example, that the equivalent of half of Denmark's total electricity consumption could be saved simply through more efficient grid power transformer designs. To help implement such changes, the European Ecodesign Directive requires power transformer and reactor manufacturers to prove that their products comply with efficiency regulations to reduce grid losses. However, precise and reliable loss measurements remain a challenging task.

This project will establish highly accurate loss measurement systems for transformers and reactors, and develop prototype devices that significantly reduce measurement uncertainty. By enabling European manufacturers to produce high quality grid components and demonstrate compliance with the Ecodesign regulations, manufacturers will be able begin making steps toward meeting the EU's 2020 energy objectives.

© serts

Project 17NRM01

Loss Measurements on Power Transformers and Reactors

Gert Rietveld

VSL, Netherlands
+31 15 269 1645
gert.rietveld@vsl.nl

www.euramet.org/project-17nrm01

Electrical interference effects on smart meter readings

Restoring customer confidence in smart meter readings

With a rollout of 200 million digital smart meters across Europe, the new wireless technology should give users real-time, accurate measurement of electricity consumption. Some meters, however, have reported results in error by hundreds of percent, with electrical interference identified as the cause of incorrect customer billing. Given that all such meters had passed inspection under the EU Measuring Instrument Directive (MID), there is a clear need to improve meter test methods, update existing standards and restore consumer confidence.

This project will develop methods to test the accuracy of smart meters for electricity consumption. Using high-precision measurements of real-world electrical disturbances, a testbed will be built in order to assess meter performance under similar, simulated conditions. To help settle billing disputes, interference-immune meter designs will be identified for on-site inspections; diagnostic algorithms will also be developed for the identification of transient current types. Ultimately, the results will support European and international standards and help restore consumer confidence in smart meter usage.

© MartinPrescott

Project 17NRM02

Electromagnetic Interference on Static Electricity Meters

Paul Wright

NPL, United Kingdom
+44 20 8943 6367
paul.wright@npl.co.uk

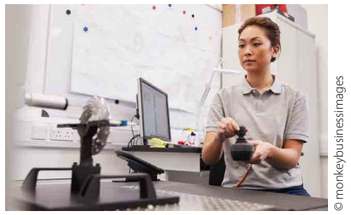
www.euramet.org/project-17nrm02

Measuring product geometries

Understanding the uncertainty in coordinate measurements

Manufacturing contributed €2.14 trillion to the GDP of EU countries in 2016. To continue its leadership in advanced manufacturing, the EU must ensure products are well characterised and accurately inspected for tolerance and quality. This is particularly the case for critical parts where functional failure could have catastrophic results, such as an aircraft failing due to a faulty turbine blade. Coordinate measurement machines (CMMs) provide a way to define the virtually infinite variety of possible geometries by using a probe to sense discrete points on the surface of an object. However, acquiring coordinate measurements can be time consuming, and evaluating the uncertainty in measurements remains challenging.

This project will deliver simplified methods for evaluating the uncertainty of coordinate measurement in industry, and provide guidance to practitioners. This will enable companies to make more reliable product inspections decisions, reducing the risk of false acceptance or rejection of parts, and ultimately helping EU manufacturers to maintain a high-quality and efficient industry.



© monkeybusinessimages

Project 17NRM03

Standards for the evaluation of the uncertainty of coordinate measurements in industry

Alessandro Balsamo

INRIM, Italy
+39 011 3919 970
a.balsamo@inrim.it

www.euramet.org/project-17nrm03

Nanoparticle size measurements for safe usage assessment

Improving nanoparticle size measurement accuracy for safety assessment

Nanomaterials and nanoparticles are finding applications across a wide range of technology sectors, from medicine and food to transportation and construction. In order to assess these new materials for potential risks to health and the environment, they need to be well-characterised. Nanoparticle shape, size and the size distribution present are all important factors for the risk evaluation process.

This project will assess a range of nanoparticle measurement systems, including Scanning Electron Microscopy and Small Angle X-ray Scattering, and deliver to users improved calibration methods. For the techniques under investigation, physical models of their response to a range of nanoparticle types will be developed; validated reference materials will also be used for a comparison of measurement systems, with an evaluation of associated measurement accuracies. With project contributions to standards development work, manufacturers will be better placed to assess the human and environmental risk posed by nanomaterials across a whole range of products.

© scanrail

Project 17NRM04

Improved traceability chain of nanoparticle size measurements

Vasile-Dan Hodoroaba

BAM, Germany
+49 30 8104 3144
Dan.Hodoroaba@bam.de

www.euramet.org/project-17nrm04

Learning by example

Improving uncertainty measurements by developing new and improved examples

From manufacturing to medical diagnosis, organisations routinely make decisions based on measurement data. Awareness of the associated uncertainty and its impacts on quality can therefore mitigate failures, risks and increased operating costs. To help industries accurately assess uncertainties, the Joint Committee for Guides in Metrology (JCGM) publish the *Guide to the expression of uncertainty in measurement* (GUM) which provides instructions, procedures and illustrative examples. Yet, interpretation and application of the GUM's principles remains difficult for many end-users, particularly as numerous examples in GUM are now quarter of a century old.

This project will deliver a comprehensive set of new or improved examples for uncertainty evaluation methods in accordance with the GUM, for example in cancer treatment dosimetry or illegal substance testing in sports. The project will also develop examples that can be used as adaptable template solutions for related problems. By enabling practitioners to 'learn by example', the project will contribute to the application of improved uncertainty evaluation, benefiting decision making in many areas of industry.

© sanjeri

Project 17NRM05

Advancing measurement uncertainty – comprehensive examples for key international standards

Maurice Cox

NPL, United Kingdom
+44 20 8943 6096
maurice.cox@npl.co.uk

www.euramet.org/project-17nrm05

Europe's National Measurement Institutes working together

The majority of European countries have a National Measurement Institute (NMI) that ensures national measurement standards are consistent and comparable to international standards. They also investigate new and improved ways to measure, in response to the changing demands of the world. It makes sense for these NMIs to collaborate with one another, and the European Association of National Metrology Institutes (EURAMET) is the body that coordinates collaborative activities in Europe.

The European Metrology Programme for Innovation and Research (EMPIR) follows on from the successful European Metrology Research Programme (EMRP), both implemented by EURAMET. The programmes are jointly funded by the participating countries and the European Union and have a joint budget of over 1000 M€ for calls between 2009 and 2020. The programmes facilitate the formation of joint research projects between different NMIs and other organisations, including businesses, industry and universities. This accelerates innovation in areas where shared resources and decision-making processes are desirable because of economic factors and the distribution of expertise across countries or industrial sectors.

EURAMET wants to involve European industry and universities at all stages of the programme, from proposing Potential Research Topics to hosting researchers funded by grants to accelerate the adoption of the outputs of the projects.

EURAMET e.V.
Bundesallee 100
38116 Braunschweig
Germany

Full details can be found at:
www.euramet.org

Dr Dagmar Auerbach
EMPIR Programme Manager
E-mail: dagmar.auerbach@euramet.org
Phone: +49 531 592 1971

The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

Publication date: September 2018

12086/0918 Cover image: © serts