



2010 has arrived – the year South Africa has been waiting for as it brings the FIFA World Cup 2010 to our soil. As the construction of the stadiums for the football games are nearing completion, new road infrastructure opens up, hospitality and food services receive accreditation, and compliance to safety regulations are ensured, we as a nation look back with pride on what has been achieved and what we will be offering the world in June.

The NMISA is just as excited about 2010 and specifically the FIFA World Cup 2010. As keeper of the national measurement standards, the NMISA is the foundation of all accurate measurement in South Africa, and primarily ensures that the South African measurement standards and units are internationally comparable and scientifically valid. In terms of the football, the NMISA's reach will be supporting all aspects of accurate measurement, from the pressure of the football to optimising the lighting in the stadium to ensuring that the timekeeping is accurate.

But going beyond the football excitement, the NMISA works closely with **the dti** and other government departments to improve the competitiveness of the South African industry in support of national strategic goals. **The dti** summarised their response to the Industrial Policy Framework in the Industrial Policy Action Programme (IPAP) in 2007, and a revised version is currently before cabinet for approval. The revised IPAP seeks to deepen South Africa's manufacturing base, and to stretch further to address challenges in other sectors. The NMISA's strategy is thus well aligned with the IPAP's objectives as metrology is crucial for the manufacturing industry, mining, aviation, construction and energy sectors, and increasingly underpins food safety, waste management and environmental monitoring.

The NMISA is looking forward to an action packed 2010, where our activities will support each and every South African, as well as the country's wellbeing.



The NMISA's pride and joy – its own soccer team! The team regularly plays other teams, and is looking forward to the 2010 season. If your institute or company have a soccer team, and would like to play a friendly against the team that keep the national measurement standards, please contact Tebogo Mdluli, assistant coach of the NMISA team on 012 841 4152 or [info@nmisa.org](mailto:info@nmisa.org)

**The National Metrology Institute of South Africa (NMISA) is responsible for realising, maintaining and disseminating the SI units and to maintain and develop primary scientific standards of physical quantities for SA and compare those standards with other national standards to ensure global measurement equivalence. It must also provide reference analysis in the case of a measurement dispute and maintain and develop primary methods for chemical analysis to certify reference materials for SA and the region.**

## Ensuring your kilogram is a kilogram

The SI unit for mass, the kilogram, underpins virtually all our trade. It is also the foundation for all chemical measurements (as the definition of the mole refers to mass) and is part of an endless number of derived units that have applications in all sectors of life. As part of the maintenance of the national measurement standards (NMS), and with the vision to improve the mass laboratory's classification from E2 to E1 (the highest class of accuracy of weights), the NMISA installed a new mass comparator in January 2010 to disseminate the national kilogram. This higher accuracy class will benefit South Africa's trade positively in the long run.



The new 1 kg comparator is fully automated with a four-position weight handler. It has a readability of within 1 microgram and a repeatability of within 2 micrograms. During the commissioning phase, the comparator performed well within these specifications.

(Contact Benjamin van der Merwe at [info@nmisa.org](mailto:info@nmisa.org))

## Regional metrology links with Asia

The Asia Pacific Metrology Programme (APMP), the regional metrology organisation (RMO) of the Asia Pacific region, is primarily responsible for developing international recognition of the measurement capabilities (CMCs) of the region's national and territorial measurement laboratories as part of the International Committee of Weights and Measures Mutual Recognition Arrangement (CIPM MRA). Part of this arrangement to prove equivalence is to participate in comparisons between the National Metrology Institutes (NMIs) in the region.

Before the establishment of the RMO for Africa, the Intra-Africa Metrology System (AFRIMETS), the NMISA joined APMP as an associate member so that we could participate in comparisons between NMIs in this region, and have South Africa's Calibration and Measurement Capabilities (CMC) vetted by APMP, thus fulfilling this requirement of the CIPM MRA. South Africa still maintains the close liaison and associate member status with APMP while the AFRIMETS technical structures and competencies are being developed. Delegates from the NMISA thus attend the yearly meetings of APMP.

Apart from the technical meetings where the comparisons of measuring standards are the main topics, the general assembly and developing economy committee (DEC) was also attended. The DEC's principal objective is to help address the needs of APMP member NMIs from developing economies, and to oversee and coordinate associated work programs similar to those in AFRIMETS and the sub-regional metrology organisation for SADC, SADC MET. Mr Donald Masuku made a presentation to the DEC and shared the experiences of capacity building programmes under a SADC EU project and the challenges faced by AFRIMETS members, most of which are developing economies. The DEC resolved to work closely with AFRIMETS in sharing experiences which will help improve the functioning and implementation of the capacity building programmes offered to developing economies.

(Contact Donald Masuku at [info@nmisa.org](mailto:info@nmisa.org) for more information)

## New employees

2010 kicked off with a number of employees joining the NMISA.



Corne Gouws was a NMISA bursar at North West University (Potchefstroom campus) and obtained his B.Eng (Mechanical) at the end of 2009. He joined the Force laboratory (Mechanical Metrology).



Refiloe Moganedi has joined the Dimensional laboratory (Mechanical Metrology). Refiloe holds a National diploma in electrical (light current) engineering and completed a nation trade in aircraft avionics.



Pieter Greef joined the Dimensional laboratory (Mechanical Metrology).

He was also a NMISA bursar at the University of Stellenbosch and recently successfully defended his M.Eng. (Megatronics).



HR welcomes Violet Makhubele, who will be assisting until the end of April 2010. Violet worked in HR for the past 5 years and has a passion for training and development.



As part of the NRF-dti Internship programme, the NMISA welcomes Pinkie Sebata to the Ionising Radiation laboratory. Pinkie will spend one year at the NMISA on the program that aims to equip young graduates with practical experience to join the workforce. Pinkie is a University of Pretoria

graduate and holds a B. Sc.



Dr Adriaan van Brakel joined the NMISA's fibre optics group (Electromagnetic Metrology) from his previous position as a post-doctoral researcher with the University of Johannesburg's Photonics Research Group. Adriaan holds a D. Ing from the Rand Afrikaans University (presently the University of Johannesburg). In 2004 he was awarded a Commonwealth Scholarship to pursue a Ph.D at the Optoelectronics Research Centre, University of Southampton in the UK, where he investigated micro-structured optical fibres for use in gas absorption sensors.

## Leading the world in Chromatography



The NMISA's Organic Metrology group hosted Mr Jack Cochran, the Director of New Business with Restek Corporation, Bellefonte, PA, USA, in December 2009 for collaborative research. Jack is a chromatography specialist in the fields of environmental and food chemistry and has been working in collaboration with various chromatographers in SA for a number of years, including the NMISA. Chromatography is an analytical separation technique used extensively in chemical analyses, both for routine analysis as well as higher order measurement research in the analysis of multi-component organic solutions and complex matrices, as is utilised in the NMISA's Metrology in Chemistry laboratories.

The objectives of this visit to the NMISA were twofold. First he demonstrated to the NMISA organic chemists how to survey pesticides in local fruits and vegetables using QuEChERS ("Quick, Easy, Cheap, Effective, Rugged, and Safe" -for more, see <http://www.restek.com/blog/>). The other aspect that was addressed during Jack's visit is the value assignment of purity to raw materials using on-column injection techniques. The complexity of the determination of purity in the analysis of many chemical and pharmaceutical compounds can be quite challenging in efforts to minimise sample losses while identifying and quantifying the impurities.

During his visit, Jack also hosted training seminars for ChromSA (the Chromatographic division of the South African Chemical Institute, SACI) on QuEChERS sample preparation. The training seminars were prompted by previous discussions on whether QuEChERS could be applied for "*my sample type and analytes*", e.g., crocodile eyeballs that were analysed as part of the investigation into the reason for the high crocodile mortalities in the Olifants River gorge in the Kruger National Park.

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