

**Brief Report to the fifth meeting
of the
Consultative Committee for Acoustics, Ultrasound and Vibration

CSIR-NML
Acoustics, Ultrasound and Vibration Laboratory**

1. ACCREDITATION

The Acoustics, Ultrasound and Vibration Laboratory (AUV) of the National Metrology Laboratory of South Africa (NML) was re-assessed by the South African National Accreditation System (SANAS) in February 2005. This was the first full re-assessment of the laboratory since it obtained third party accreditation in 2001 and therefore included a technical assessor of its peers from the National Metrology Institute of Taiwan, (ITRI). During the assessment, the scope of accreditation was extended in both the Acoustic as well as the Vibration fields.

The extension of accreditation in Acoustics included imported traceability for ½" microphones as well as reduced uncertainty of measurement (UOM) for the calibration of sound sources and certain microphones. The laboratory successfully submitted improved CMC's for 13 lines of CMC entries relating to Acoustics.

In the area of Vibration, the laboratory extended its scope of accreditation to include primary complex (magnitude and phase) sensitivity calibration of accelerometers in compliance with ISO 16063-11, using method 3. This improved calibration schedule led to the successful addition of six CMC lines, relating to phase calibration of accelerometers and the update of 14 CMC lines, relating to improved UOM.

2. ACOUSTICS

The laboratory is in the process of developing measurement capabilities for the generation and measurement of sound intensity standards. After the completion of the projects, these systems will become National Measurement Standards for the parameter of sound intensity.

The project is well on its way. All the required equipment have been obtained. Mr Riaan Nel is in the process of developing the required measurement procedures. This will be followed by a validation process as well as the development of uncertainty budgets. Mr Nel is performing the development of these standards as part of his continued studies at the Tshwane University of Technology.

3. VIBRATION

The laser interferometer system, based on ISO 16063-11 method 3 (sine approximation method) has been successfully implemented over the frequency range 10 Hz to 10 kHz for the complex sensitivity

(magnitude and phase shift) calibration of accelerometers. Based on this system, new CMCs have been submitted and accepted for inclusion in Appendix C of the BIPM database.

The development of a separate low frequency system to cover the frequency range 1 Hz to 40 Hz is in progress.

At the end of 2004, the laboratory said good bye to Ms Katrina Davis after more than 15 years of service to the NML. During 2005, the NML was part of "Beyond 60", a restructuring process run by the CSIR. With this process the CSIR re-aligned itself to optimise scientific development. Following this process, Mr Moses Temba joined the Vibration section of the AUV laboratory. Mr Temba has extensive experience in AC voltage metrology.

4. COMPARISONS

No International nor Regional comparisons were conducted or participated in by the laboratory during the past 2 years. The laboratory however did run the national audit scheme for accredited laboratories under contract to SANAS in the Vibration field.

5. REGIONAL ACTIVITIES

In the SADC MET region, emphasis is placed on ensuring that all SADC member countries have some metrology capabilities, with the focus on metrology parameters relating to trade such as mass, volume and length. Further developments are in progress and member countries are actively improving their metrology infrastructure. These improvements include the implementation of quality systems and obtaining third party accreditation, mainly provided by SANAS.

In related fields, the Kenyan Bureau of Standards (KEBS) has received funding to establish measurement standards for Acoustics as well as Vibration. The project for the establishment of these standards is nearing completion with the equipment delivery, installation and training which is planned for October 2006.

5.1 NEPAD

The New Partnership for Africa's Development (**NEPAD**) is a vision and strategic framework for Africa's renewal.

NEPAD primary objectives are:

- Acceleration of poverty eradication & inequality in Africa
- Reversing Africa's marginalization in globalization process
- Increased market access for Africa's exports (critical for its sustained dev & integration into global economy)

- **Fact:-** Africa's participation record in international trade over past decades has been in consistent decline: 6% to 2%: Why??

AFIRMETS are necessitated to promote and support an integrated measurement infrastructure in Africa that ensures equity in the market place, improves the quality of life and facilitates intra-Africa, inter-Africa and Africa's share of global trade.

5.2 AFRIMETS

On the 24th March, 2006 at Midrand, South Africa, a workshop was held to launch a system of AFRIMETS. At this workshop the following resolutions were undertaken:

- To create the InterAfrica Metrology System (AFRIMets), as the umbrella body for Metrology Cooperation in Africa, encompassing legal, scientific and industrial metrology.
- The AFRIMets will be an open non-exclusive partnership to stimulate collaboration in the area of Measurement standards and Measurement in Africa.

This resolution empowers NEPAD, in cooperation with SADC MET, to establish a task force to take all the necessary actions to give effect to this declaration.

