Brief Report to the 11th meeting
of the
Consultative Committee for Acoustics, Ultrasound and Vibration

NMISA
Acoustics, Ultrasound and Vibration Section

1. STAFF COMPLIMENT

The Acoustics, Ultrasound and Vibration (AUV) Section of NMISA current staff compliment is as follows:

- Section head:
  - Dr Aletta Karsten
- Acoustics laboratory
  - Sound in air
    - Two metrologists, full time
- Ultrasound laboratory
  - Ultrasound and sound in water
    - One metrologists, full time
- Vibration laboratory
  - Sinusoidal and Shock Acceleration:
    - Two metrologists, full time
    - One student, temporary
- Research activities:
  - Two students, temporary

2. ACCREDITATION

The Acoustics, Ultrasound and Vibration Section (AUV) of the National Metrology Institute of South Africa (NMISA) were re-assessed by the South African National Accreditation System (SANAS) in May 2016. This was a re-assessment of the Section's capabilities with an international technical assessor assessing the relevant technical capabilities and aspects of the Section.

During the assessment, the Section made improvements to its scope of accreditation.

3. ACOUSTICS LABORATORY

The Laboratory completed the process of validating it's LS1P and low frequency pressure reciprocity capabilities. The capabilities were validated through the regional key comparison, AFRIMETS.AUV.A.K5

The Laboratory is in the process of developing calibration capabilities to provide traceability for artificial ear and artificial mastoid calibration.

The Laboratory is in the process of acquiring instrumentation to be able to provide a calibration service for low frequency microphones and monitoring devices.

4. VIBRATION

Over the past view years, the laboratory was involved in replacing and upgrading the equipment for the realisation of the vibration NMS. The replacement of older instrumentation enabled improvements to existing capabilities. New capabilities were established through the acquisition of new calibration systems. These include;

- Extending frequency ranges (magnitude and phase) for secondary calibration.
- Extending acceleration level capabilities up to 4 000 m/s^2 using secondary methods.
- Secondary shock capabilities (50 m/s^2 to 10 km/s^2).
- Improved primary low frequency capabilities with the implementation of a 450 mm peak to peak air bearing vibration exciter.
- Upgrading existing primary method software to enable homodyne as well as heterodyne demodulation techniques.

Current development work in vibration includes:

- Primary shock capabilities
- Extending the primary rectilinear acceleration calibration frequency range from 10 kHz up to 20 kHz

5. SOUND IN UNDERWATER

The Laboratory acquired commercial systems to implement primary and secondary hydrophone calibration. Once these systems are in place with supporting procedures and uncertainty budgets, the laboratory will apply for SANAS accreditation of these capabilities.

6. ULTRASOUND

The Laboratory acquired commercial systems to implement sound power measurements using a radiation force balance. Once this system is validated, supporting procedures and uncertainty budgets developed, the laboratory will apply for SANAS accreditation of this capability.

7. CMCs

NMISA is currently in the process of submitting revised CMCs to reflect its new and improved capabilities reflecting the last few years investment and scientific work.