Bilateral Comparison between NMISA and MIKES – Part of the NMISA Flow Laboratory Journey to Accreditation

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The NMISA Flow laboratory is in the process of obtaining ISO/IEC 17025 accreditation. The laboratory is compelled to perform the majority of gas flow calibrations in South Africa, due to severely limited accredited gas flow calibration capacity in industry. This is resulting in unacceptable long lead times.

The laboratory is equipped with a positive displacement piston prover as the highest-level standard. Traceability is obtained by sending this secondary standard to overseas National Metrology Institutes for calibration. The necessity of sending the reference standard overseas for regular re-calibration in order to maintain sufficient confidence in the reliability of the results, means an absence of about two months from the laboratory, creating a further impact on the calibration lead times. Intermediate measurement checks are performed with flow cells overlapping in different flow ranges to prove reliability of the measurement results and compliance to the requirements of ISO\IEC 17025. A bilateral comparison was performed with the MIKES Flow laboratory to validate the mass flow controller calibration method of NMISA, as well as to assess metrologist competence. MIKES acted as the pilot laboratory.

To address the long lead times, a set of laminar flow elements covering the flow range 0,5 mL/min to 50 L/min, was purchased as another reference standard. Two reference standards in the laboratory will eliminate the situation of a two months absence of reference standards from the laboratory and will increase the calibration capacity of the laboratory.

This paper gives an overview of the NMISA Flow laboratory, the progress made towards ISO\IEC 17025 accreditation and discusses the bilateral comparison; artefacts used, method employed, and measurement results. Future developments planned for the laboratory are also discussed.