METROLOGICAL INFRASTRUCTURES

75 Years of Trade Metrology in South Africa

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Introduction

Legal, or Trade Metrology as it is known in South Africa, was established as a Central Government function on 1 May 1923 with the promulgation of the Weights & Measures Act (Act 32 of 1922). May 1998 therefore heralded in 75 years of service to South Africa. The culminating highlights of our celebratory year were a seminar on the latest developments in South African Trade Metrology and a banquet for staff and other dignitaries.

History

1652–1922

The first European settlers arrived in Southern Africa to establish a provisioning station for the Dutch East India Company in 1652. The first reference to any matters metrological was the "Statuten van India 1681", which demanded the verification and reverification of scales every two years.

Owing to the alternating occupation of the Cape Colony by the Netherlands and the British Empire, a mixture of the two systems of measurement, used by the occupiers, was adopted.

As the pioneers migrated, the Dutch system of measures was established wherever settlements were established. In 1850 Dutch measurement systems were in use in Transvaal, Orange Free State and Natal. As scales were difficult to transport during the Great Trek, measures such as the bucket or scheple were used. Distance was measured by "an hour on horseback".

A need for statutory control was sorely needed and after 1850 various laws were passed by the different colonies. It is not known to what extent control was exercised, as there is no record of the employment of trained assizers until 1902, when the municipality of Johannesburg appointed one.

1923–1998

A need for uniform control was advocated by commerce but was not effected until the Union Government passed the Weights & Measures Act in 1922.

The Assize division was established on 1 May 1923 in the Ministry of Mines and Industry, with 27 staff members. There were offices in Cape Town, Johannesburg, Port Elizabeth, Bloemfontein and Pretoria. The equipment used by the major Municipalities was transferred to the National Department.

Owing to the vast areas that need to be covered in South Africa, verification itineraries initially took up to 6 weeks. The first itineraries were done by train with an Assize station being held in the town hall or a garage or at the local police station.

With the advent of more mechanical instruments and later of electronic instruments, Assize stations were discontinued and instruments were verified in situ.

The Assize Division grew through the years to fifteen regional offices and changed its name to Weights & Measures and eventually to the Trade Metrology Department.

In 1991 the Trade Metrology function was transferred to the South African Bureau of Standards (SABS) but remained as a Central Government function supported by the Department of Trade and Industry and ultimately reporting to the Minister of Trade and Industry. The move came with a drastic reduction in staff, since the modus operandi was to change to make way for privatization of the verification function.

As already mentioned, the verification and reverification function has been privatized by means of an accreditation scheme utilizing Code of Practice SABS 0259, which is based on ISO Guide 25. There are presently ± 110 accredited verification laboratories in the mass and volume fields.

The Trade Metrology Department is once again in the process of re-evaluating its function, responsibilities, staffing, funding and commitment by Government.

There is a position plan presently at the Department of Trade and Industry for submission to the Minister; this plan sketches various scenarios to elevate the service and control to levels found in developed countries and takes account of the South African Constitution which gives greater powers to Provincial Governments.

South African legislation

Trade Metrology legislation in South Africa developed along British lines through the colonial era and has generally kept pace with international trends. Although regulatory requirements were amended to cater for electronic instruments, this area of legislation has not kept pace with the latest technology over the last ten years and we are in the process of replacing it with OIML Recommendations. Currently legislation only covers trade use instruments and it is our intention to expand into the full spectrum of legal metrology in due course. Regulations dealing with the labeling and sale of goods are also presently under review as part of a Southern African Development Community initiative to remove technical barriers to trade. It has, however, proved difficult to find a model which is completely acceptable internationally.

Functions

The Trade Metrology Department controls the full ambit of trade metrology, from type approval of instruments to packaging and sale of goods.

Type approval of instruments used in trade

The type approval of instruments used in trade is regarded as an integral part of the Trade Metrology function and great emphasis is placed on accomplishing this task to the best of our ability. We have the capability of conducting most tests prescribed in OIML Recommendations; our most noticeable deficiency is a test facility for conducting tests on load cells according to OIML Recommendation R 60. We have of late changed our modus operandi in that we will accept OIML approval certificates for instruments where our legal requirements are in line with OIML Recommendations. For instruments where our national regulations are not yet in line with OIML Recommendations, we will only conduct outstanding tests after evaluation of the OIML test results submitted.

Local, regional and international liaisons

The Department is involved in meetings with local industry regarding creation of specifications, amendments to the Act, etc. On the regional level we are actively involved in SADCMEL (Southern African Development Community Cooperation in Legal Metrology). Mr. Brian Beard (Director of Trade Metrology) is presently the Chairman of SADCMEL. We are also members of IOLMF (Indian Ocean Legal Metrology Forum).

On the international front we are members of OIML. We are also busy building up contacts with the Legal Metrology Community wherever we are afforded the chance.

Inspection of goods (reactive)

At present inspections of prepacked goods are primarily carried out on a reactive basis. There are moves afoot to revert to proactive inspections, because control in the market place has been eroded by lack of inspection.

The Department is also presently in the final stages of having specifications published for "Measuring Container Bottles" (SABS 1840) and "Control of the quantity of contents in prepacked packages within the legal prescriptions of the Trade Metrology Act and Regulations" (SABS 1841). Both of these documents are based on the OIML and European models.

Inspection of measuring instruments used in trade (reactive)

The inspection of instruments used in trade is also carried out on a reactive basis, which has led to a situation where reverification of instruments is not being done as required. Of necessity we are becoming more proactive in this area.

Creation and maintenance of legislation

It is the role of the Department to ensure that National Legislation at all times meets the national requirements, but that is also in line with international norms and aligned to regional interests. To ensure this we are presently involved in the harmonization of legislation within the SADC region. We also intend to adopt OIML Recommendations where these are available.

Training

Trade metrologists in South Africa are required to have a National Diploma in Electrical Engineering (light current). Before being appointed under the Act, training on the Act and Regulations is given in-house for a period of one year. Refresher courses are given when required. We are currently assisting with the establishment of a Southern African Resource center for Metrology Education and it is envisaged that in future our courses will be offered through this institution.

Accreditation of verification laboratories

The verification of instruments used in trade is undertaken in large by verification laboratories which are accredited by the Department. Laboratories are accredited against the SABS 0259 Code of Practice, which is based on ISO Guide 25, and audits are done twice per annum. The accreditation covers both initial and re-verification.

Verification of measuring instruments used in trade

The Department has the capability of verifying all instruments falling under the Act and it is responsible for verifying instruments where this service is not supplied by accredited laboratories. These are mostly instruments for which it is not financially viable to become accredited or provide a service.

75th Year celebrations: 1 May 1998 – 31 April 1999

One of the major events in our 75th year of service was the accession of South Africa to the OIML in August 1998.

To culminate our celebratory year a seminar, as well as a banquet, was arranged.

On 2 February 1999 a one-day seminar was held which was attended by 150 delegates representative of the Government, Industry and the international fraternity. The international guests who attended were Mr. G. Faber (CIML President), Mr. B. Athané (BIML Director), Prof. Dr. M. Kochsiek (CIML Vice-President and PTB Vice-President) and Mr. J. Birch (Executive Director of NSC Australia and APLMF Convenor). Papers covering the following topics were presented by members of Industry, the Trade Metrology Department and Mr. Birch:

- 75 Years of Trade Metrology;
- Importance of Legal Metrology for the economy of the country and foreseen developments into the 21st century;
- Accreditation of verification laboratories - A weighing industry perspective;
- SADCMEL/OIML - Harmonization on marking requirements of prepacked goods;
- SADCMEL/OIML - Harmonization on requirements for measuring instruments;
- Prescribed packaging patterns for prepacked goods - Deregulation or not;
- Specification SABS 1841 - Control of the quantity of contents in prepacked packages within the legal

Left to right: J. van den Heever, F. Hengstberger, A. Stoltz, B. Beard, E. Tarnow, S. Carstens, B. May, J. Birch, L. Heekes, T. Mothapo and Z. Fourie

prescriptions of the Trade Metrology Act and Regulations - An industry perspective;
- Specification SABS 1840 - Manufacture of measuring container bottles;
- National Measurement Standards - An overview;
- Type Approval - Procedure for approval and acceptance of OIML documentation;
- SADC Resource Center of Metrology Education (SRCME) - An overview;
- Proposed future of Trade Metrology in South Africa.

A plaque was unveiled at the Trade Metrology Department's Offices by Dr. Henri Van Rensburg, General Manager of Standards at the SABS, on 3 February 1999. The banquet was held on the same evening and the Guest Speaker was Mr. Faber. Excerpts from his speech are printed on pages 32–33.

Mr. Beard presented Messrs. Faber, Kochsiek and Birch with a commemorative gift and Prof. Kochsiek in turn handed over a gift from the PTB, which is now displayed in the entrance hall of the Trade Metrology Building.

Conclusion

Over the last 75 years Trade Metrology in South Africa has provided an adequate service to meet the demands of consumers and industry alike. The stage has now been reached where the function must be reassessed to enable us to meet international, regional and local needs for the new millennium. We appreciate the support received from the international legal metrology fraternity over the past few years and look forward to continued interaction in the future. Having become a full OIML Member State we intend giving the Organization our full support. ■

L to R: Messrs. B. Athané, J. Birch, S. Carstens, B. Beard, G. Faber and Prof. Dr. M. Kochsiek (International Guests with Director and Deputy Director)

L to R: Dr. Henri van Rensburg (General Manager Standards SBU) and Mr. Brian Beard (at the unveiling of the plaque)

L to R: Mr. G. Faber, Prof. Dr. M. Kochsiek and Mr. B. Beard

Excerpts from the speech given at the banquet by Mr. G. Faber, CIML President

Ladies and Gentlemen,

It is a great pleasure for me to visit South Africa, it is my first time and it will certainly not be my last trip to this wonderful country.

As you know, I am from the Netherlands, so my mother tongue is Dutch. However experts told me that English is spoken by almost everybody in this country, so I speak to you in English which, by the way, is not the official language of the OIML - that is French - but more and more the working language.

There are at least two reasons to congratulate you tonight, Ladies and Gentlemen. The first reason is of course the seventy-fifth anniversary of Trade Metrology in your country, I will come back to that later. And the second reason is that now, since a couple of months, South Africa has entered the OIML as a full Member. This was really a big step, not only for you, but also for all other members of the legal metrology family.

Mr. Faber went on to introduce the OIML before speaking about the role of legal metrology in today's society.

So what is the importance of legal metrology in today's society?

One can say that legal metrology remains the most efficient tool to protect individuals and society as a whole whenever incorrect measurement results may affect their economic or social status or when conflicting interests are associated with measurement results.

Owing to the importance of metrology in the social and economic development of our societies, governments have a responsibility in ensuring that the basis for correct and credible measurements exists in all countries. This governmental interest mainly covers matters such as the establishment and maintenance of national primary measurement standards, the traceability schemes which enable the dissemination of measurements units, information and education, research, etc., and of course legal metrology.

Legal metrology mainly applies in fields connected with trade, health, safety, the environment and official controls.

However, in most countries, these various fields of application of legal metrology are not the responsibility of a single public service. In fact, several ministries are concerned with these matters and there is therefore a need for coordination at national level in order to ensure that every public body responsible for controlling part of the global legal metrology field carries out its tasks in line with sound metrological guidelines.

Here appears the concept of a national metrology system which has been the subject of thorough discussions during a Seminar last year held in Braunschweig, Germany.

It is on similar concepts that the OIML is redefining its strategy and long-term policy.

The globalization of exchanges and the multiple interactions between the various elements of our society lead us in the direction of a deeper integration of the activities carried out at international level.

In fact, in the same way that metrology systems must exist at national level, there is a need for a kind of global, worldwide measurement system to which all measurements will be related.

It is on the basis of these general ideas that the OIML is developing its new strategy. I have entrusted Knut Birkeland, my predecessor as CIML President, with a study of what the OIML strategy should be. This study was presented to the Committee in 1998 and it is expected that the Committee will take decisions about its implementation during the next Committee meeting, this year in Tunis.

May I now offer you some views concerning the possible future trends of legal metrology both at national, regional and international levels.

By definition legal metrology is a governmental matter. However, this does not mean that governments must directly enforce all national legal metrology tasks.

It may be quite acceptable in many countries that a large part of these tasks, especially those connected with the testing and verification of measuring instruments, be allocated to non-public bodies, including private laboratories and even the manufacturers themselves. This, in my opinion, is a trend which will become more and more effective in most countries and which will contribute to giving legal metrology controls the maximum of efficiency and flexibility.

Of course, the development of regulations and final decisions must remain under the public authorities' control.

Now, concerning the scope of legal metrology and its developments, I would like to advise responsible bodies to be cautious.

We are now living in a period of deregulation, which means that any unnecessary regulation should be eliminated. What about legal metrology regulations? Owing to the importance of metrology and legal metrology in the economic and social development of any countries, such regulations should not disappear. However, legal metrology authorities should not try to over-regulate. There are many metrological activities which may be carried out, many measuring instruments which may be used without regulations. Therefore, such regulations must strictly be limited to the fields where they are necessary. It is with this in mind that the OIML work program is reviewed at regular intervals in order to eliminate any unnecessary work.

Regionalization is also a characteristic of the present day in many human activities, including legal metrology.

There are many actions which are far easier to carry out at regional rather than at international level: intercomparisons, cooperative training, technical assistance, and of course establishment of common regional resources.

A decisive trend for the next ten years will therefore be the development of regional cooperation in legal metrology, the OIML having the essential responsibility of ensuring the necessary coordination among the various regions.

If I now consider the international level, I believe that the most important challenge we are facing will be the establishment of a real

climate of confidence among countries concerning measurement results in general and, as a first step, confidence in test results.

Several strategies may be adopted: accreditation of testing laboratories, peer assessment, intercomparisons, transparency concerning laboratory capabilities, etc.

The OIML has an important responsibility in this field and has already started working on certain of these aspects.

However, the globalization of our economy is such that one organization alone cannot be successful. The OIML must closely work in coordination with a number of other international bodies, the Meter Convention in all fields of metrology, also ILAC and IAF for matters connected with accreditation, worldwide standardization bodies such as ISO and IEC, trade and economic organizations - in particular the WTO with which the OIML has now observer status - and many other organizations.

Now, finally let me come back to the anniversary of trade metrology in South Africa. I would like to make two comments to that.

Firstly, the fact that SABS is organizing such an important seminar and also this magnificent banquet is a recognition of the importance of metrology, and especially legal metrology, in our modern societies. Metrology is a basic tool for improving the quality of life, products and services. Personally, I always have been very happy and proud to work for metrology and I am sure the same goes for you.

And secondly the term "trade metrology" draws my attention. On one hand this term is very limited, because, as I explained, metrology has also responsibilities in fields such as health, safety and the environment. On the other hand, trade metrology comprises more than only legal metrology and that is right because the ultimate goal of metrology in trade is to obtain nationwide and international credibility in measurement results. Well, to reach that goal, one needs a lot of things: good measurement standards, good measuring instruments and good measuring procedures. And that is, by the way, exactly the reason why I am very much in favor of a good cooperation between the OIML, BIPM and ILAC.

Ladies and Gentlemen, that is what I wanted to say to you tonight. Let me again say that I am very happy that South Africa is now a Member of our world metrology family, so that we can profit from 75 years of metrological experience.

Thank you for your attention. ■