Future 2017

Slide 1

Today, I will provide you with some brief background information on the OIML. I hope that most of you are already familiar with the work of the OIML of developing written standards.

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An outline

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For most here, I am unknown to you. I will begin by telling you that I am not a metrologist. I am an engineer and an association executive who has been involved in the technology and processes related to metrology for over 40 years. It is with the experience of product design, applied research and development, production automation, national and international standards development, enforcement, finances and solving problems that I share some of my own thoughts with you today.

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I would like to start with a quote from a publication that is now nearly 20 years old, however, I find it to be very relevant today. (Read from slide)

" It is dangerously easy to lag behind, to serve yesterday's world instead of today's, neglecting to prepare for tomorrow's. To be boxed in by the trivial chores of every day and let the world change unnoticed, like the driver who concentrates so hard on keeping his car in the lane on the motorway that [he does not notice the exit]." Knut Birkeland 1998: Legal Metrology at the Dawn of the 21st Century: The Role and Responsibilities of the OIML

Birkeland is a former CIML President and author of this Expert report. I would suggest that all of you take a few minutes to review this document and see if you think, as I do, that it is still as relevant today as when it was written.

I would now like to take you on a little journey ….

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Many of us are familiar with, however may have not actually used the abacus. From records, it was invented nearly 4700 years ago.

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While there were some improvements during these many years, it was not until about 400 years ago that the first slide rule came into common use. This is the instrument, along with many books and tables that I first used in my early education as a Mechanical Engineer.

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Then there was a dramatic shift that took place about 45 years ago with the first handheld calculators. Note that this early version would only add, subtract, multiply and divide. There was a decimal point, but no memory, no equations, no scientific notation, not even a square root function. But things began to progress rapidly.

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Just 10 short years ago came the first so called smart phone. Now, I cannot comprehend how I functioned prior to this "invention". But I need to ask you a question. Is this just a mobile phone? Or is it a calculator, an internet search tool, what about a banking machine, or a device that will help us save on our gas/electric bill by connecting to a smart meter, or is it a taximeter?

I have taken you on this short journey through history to show the significant changes that have taken place, in particular in the past 50 years, which is during the lifetime of many of the people in this room.

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To focus for a moment on metrology in the present time. You may have heard about the redefinition of the SI. A small number of NMIs are now working on the redefinition of the kilogram. This very round silicon sphere may play a central role in that redefinition.

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Here is one example of a Watt balance or what is now called a Kibble balance. It is also being used by several NM's in the work to redefine the kilogram. While I do understand the significance of this work and how it will greatly change and improve the way in which the SI units are defined… I wish for you to look closely at this next slide.

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This may be the most important slide of the whole presentation. I must point out that in a large part of world today; legal metrology, trade in a market, is still taking place on devices like you see here. There is no NMI, no law on metrology, no inspectors, no demonstration of traceability to international standards. There is only trust between two people making a trade, face to face. This is how trade went on for many thousands of years.

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But now in many parts of the world, trade in prepackaged products has completely replaced bulk trade of items. I must ask, is there any knowledge of how the net weight was determined for the contents? Is there any knowledge where this value was determined? Wherever I travel, there is concern expressed and work now being done on attempting to verify or certify prepackaged products. Currently however, nearly all the work being done in this area is at the national level. The best the OIML has been able to achieve is a possible guide on prepackaged products. I believe that Alan Johnston will be presenting on prepacked items in Canada.

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For much of my career in the field of legal metrology, it appeared that the instruments involved in legal metrology were related to "legal for trade" transactions. Transactions taking place in person, between a buyer and seller. However, in the world we live in today, legal metrology is much more than retail scales and petrol pumps.

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The OIML website indicates that legal metrology is not only related to trade, but also to health, safety and the environment. While this is a very true statement, the reality is that in many countries these four different areas of legal metrology and in many cases even instruments in the same category are located in very different departments, ministries or organizations of a government. In certain countries some of these categories of legal metrology may even be handled by private organizations. Since each country has its own structure and names, I will not attempt to define these for you. However, if you think of these four areas and the work you may do in these areas, I suspect that you can think of how these separations look to you. All of this, in my opinion, leads to fragmentation of standards, fragmentation of enforcement and a lack of exchange of information.

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These new areas are all characterized by the usual problems caused by inconsistent, fragmented and non-coherent legislation, with metrologically unrelated regulators, implementing bodies and user groups. It impedes a rational use of the global measurement system and cost-effective compatibility. (paraphrase Birkeland)

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I have been taught that there are three different types of metrology. While they may interact, it was said that legal metrology was the area of the OIML, scientific metrology was the area the BIPM and industrial metrology was the area which ISO and others were involved in. However, is this correct in the thinking and technology of today, and into the future? Does this type of thinking lead to further fragmentation?

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Today we are hearing of “smart everything” We have all types of information now stored “in the cloud”. There is now technology for self-driving cars; Online shopping, drones for delivery of products. We are all faced with the reality of various alternative fuels and energy. There is also now the internet of things which has the potential to control many of the devices in the developed world, including instruments used in trade. This is the so called Industry 4.0

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In the area of legal metrology as mentioned we have prepackaged goods being sent all over the globe, now nearly all electronic instruments are controlled by software and communicating through the internet. There is great advancement in technology today and it shows no signs of slowing down.

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But for the most part, legal metrology is still utilizing the same tools which have been in place long before this great technology advancement began. Namely Pattern Approval, in some limited cases there are now attempts at conformity to type, verification both at initial installation and subsequent follow up and recent attempts at market surveillance. In most cases these are on a national or at best a limited regional basis. But I must ask, are the standards which are available and the training of the technicians doing this work sufficient to enable us to ensure that instruments used in legal for trade or regulated measurement activities actually meet type and accurately provide the expected information. Is anyone today actually able to verify the software used in a particular instrument? I am certain you are aware of the inaccurate readings found during recent automobile emissions testing.

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I am not just the Director of the BIML, but I am also a consumer and I am affected by the instruments and technology involved in metrology every day. It is clear that legal metrology touches each of us every day. However, I suggest that there may be a different way of looking at metrology. This different view is that there is only metrology,…which is used in in many areas including: scientific, legal and industrial areas.

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Is there a way in which to approach metrology in order to meet the challenges this new technology presents.

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In the short term, one area which is very clear to me is for its part the OIML must do a much better job at reviewing, revising and promoting implementation of its Recommendations. Many of the OIML Standards are currently out of date. This is an area of high priority for me, President Mason and vice presidents Schwartz and Miki. However, currently this work relies heavily on a very small number of volunteers from a small number of OIML member states.

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An additional item is the implementation and promotion of the newly revised OIML Certification System. This system should provide increased confidence in the Pattern Approval Certificates registered by the OIML. If implemented correctly this should allow resources to be shifted at the national level from national pattern approval activities to pre-market surveillance, market surveillance, verification.

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Many of you are familiar with the organizations listed here. There has been interaction and even memoranda of understanding (MOUs) among them. However, I propose to you that this cooperation must be greatly improved and expanded if we are to meet the challenges we all face with the rapidly changing technologies of today and into the future. There also must be an expanded cooperation with other international organizations that are involved in the measurements that must be made, and the data that must be exchanged.

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Currently there is a network of a number of international organizations which work together to assist developing countries in the area of quality infrastructures. At this point I would pose another question, in light of the rapid change in technology, the advancement of software and the use of smart instruments, is not every country developing a new or at least revised set of standards, procedures and policies which affect their national quality infrastructures to address the issues we face today?

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A great deal of discussion is now taking place on quality infrastructures. A true quality infrastructure contains elements from all of the international organizations in the previous slide.

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In most cases these are being discussed as national quality infrastructures. In a few instances there is some work beginning on regional quality infrastructures.

However, I pose another question, is it possible to create an international quality infrastructure?

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“German Chancellor Angela Merkel said recently that the digital world needs regulations like those that exist for financial markets in the G20 and for trade under the World Trade Organization.

Global policymakers are facing uncharted territory as emerging technologies open new frontiers for regulation with the inter-networking of smart devices and trends in the automation of factories, dubbed Industry 4.0 by German politicians.” Reuters June 2017

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If you think about what I have presented to you, in the context of the international organizations, we all have a current level of Standards and Methods, which are represented by these two lines. Consider we now all have existing stakeholders or clients. But we know that we must grow and there are many demands for improved standards and methods. If we do not improve we could lose our existing clients. We have choices we must make. We can take the easy path and look for new clients, but within the same level of Standards and Methods. But will this really help us grow into the future or are we just content with living in the past? We could however, attempt to satisfy our existing clients increasing demands by revising or improving our own current Standards and Methods. But will this be enough to allow us to exist in the future? If we are bold and embrace change we could move in a very different direction to not only revise and improve our own current Standards and Methods to meet the demands of our current clients but also work and promote ourselves together to attract new relationships and attract new clients that are also looking for these improved Standards and Methods.

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But can we really do this? As a starting point, I propose that the Regional Legal Metrology Organizations (the RLMOs) around the world begin discussions on coordinating work related not only to the OIML – CS but to the whole quality infrastructure, leading ultimately to an international quality infrastructure.

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I use an example of how this might work: some of you are familiar with the Regional Metrology Organizations working together within the framework of the CIPM MRA. You will hear more of this from Andy Henson tomorrow. In many cases these are the same organizations working in both legal and scientific metrology. So there are already experiences of regional metrology organizations in working closely together on an international level.

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Can legal metrology begin to build a similar framework to address the challenges of this rapid advance in technology?

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Is it possible to move from a National focus? To an international focus?

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A quality infrastructure must contain Standards, Regulations, Metrology, Accreditation, Certification, Conformity Assessment as a minimum.

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If I may propose, in this time of rapid change and technology development, we must embrace change. We also must pull together the vast resources of all of the interrelated organizations and work to eliminate the fragmentation that we currently have in metrology. With one metrology as a significant part of developing an international quality infrastructure we can begin the journey forward and begin to solve these challenges ahead.

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I will leave you with a quote from Knut Brirkeland: (READ IT)

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I thank you for your time and attention.