

INTERNATIONAL MEASUREMENT CONFEDERATION IMEKO BULLETIN

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Nyomás:

50 years IMEKO

How time flies!

On September 8 and 9 the International Measurement Confederation invited friends, colleagues and members to celebrate its **GOLDEN Jubilee** at the birthplace, in Budapest, Hungary, within the framework of the annual General Council Session and related meetings. Still, this was different - everybody felt the grandness of the occasion and was happy to be part of it. We were all aware that 50 years did not go by without leaving a mark on the minds and spirits, good or - perhaps sometimes - not so good memories of happenings and persons, but being together again with those who cared prevailed by all means. History did its part, too, and changed basically everything that was there in 1958. However, the enthusiasm, devotion, common sense and goodwill won and helped overcome temporary difficulties. The ties lasted, developed into a certain friendly relationship and became stronger and

wider as time passed by. The year 2008 is, thus, a special one for us. It brings back the past and shows the direction to the future. New objectives to be accomplished by a new generation lie optimistically ahead. Stability and continuity - are the virtues to be observed.

IMEKO Bulletin was first published (only) in October 1972. Now, No. 47 is devoted primarily to the magnificent subject of the headline above!

Delegates and guests of the **51st General Council Session** were officially **welcomed** by the Secretary General of the Hungarian Member Organization, the Scientific Society of Measurement, Automation and Informatics,
Dr. László Ludwig:

Ladies and Gentlemen:

As Secretary General of the Hungarian Scientific Society of Measurement, Automation and Informatics I am honoured to welcome you all in Budapest on the occasion of the 50th anniversary of the founding of the International Measurement Confederation. I was elected Secretary General only in May, following in the footsteps of colleagues who have been taking active part in the life of IMEKO, but I am also aware of the special responsibility deriving from the fact that our Society has been one of the founding societies in 1958. It is a real pride to remember that and really, no other location could have been more appropriate to recall the past and celebrate the present, the impressive development of the long years, than here. We are confident that further achievements lie ahead. MATE, by all means, intends to remain part of it.

Let me wish you successful meetings, a joyful gathering and a pleasant stay in Budapest.

* * *

The nostalgic **Opening Address** by the Secretary of IMEKO
(since October 1, 1971) was distributed beforehand and reads as follows.

Ladies and Gentlemen:

Our warmest welcome to you all here in Budapest, where the roots of the International Measurement Confederation started to spring up and after many years even bring fruits. The past 50 years have not always been easy, due to different reasons, human failures and historical circumstances beyond our control, but now it can be clearly stated that we have come a long way and achieved a lot. The original goals were to offer the widest possible forum for an exchange of knowledge in a split world. We can proudly say that, as time passed by, we have created a unique, friendly atmosphere for measurement and instrument technology experts to meet and discuss the trends, to learn from each other, to help and cooperate for mutual benefit. After some mistrustfulness and aversion at

the beginnings confidence has gradually grown from the recognition of the usefulness and bearing of the aims and objectives, so in the year 2008 we are organizing the 19th IMEKO World Congress with 39 Member Organizations from the five continents and 24 Technical Committees.

There was no doubt that this year the General Council and all those who have ever been actively connected to IMEKO should return and celebrate here. We were looking forward to meeting the pioneers or at least to hearing from them on this occasion. We were, of course, aware that the news will not always be joyful, as 50 years are a long time, almost a life-time actually. We are very happy to greet personally highly esteemed former Officers, GC and TC members and appreciate their decision to come and see us again. Mr. S.S. Carlisle, UK, President from 1973 to 1976 sent a message wishing us well, as he was unable to travel due to old age. Also Professor Christof Rohrbach, German delegate for many years and one of the main organizers of the 9th IMEKO World Congress in 1982 regrets that he is not able to be here now. However, we can not hide our disappointment caused by the lack of response on behalf of others who have been cordially invited.

We will be going further on the road paved by the predecessors and fulfill our tasks. There will be new people coming, another generation, hopefully with the same enthusiasm, with the necessary sense of duty and responsibility, to prove that the earlier fights and efforts were not in vain.

With such thoughts in mind let us enjoy being together, remember the past but look ahead into a bright future.

Karolina Havrilla

* * *

Under item 6/ of the Agenda, the **Secretary General of IMEKO**, Professor Mladen Boršić (Croatia) started his usual Report with a historic overview:

In the past period the Secretariat concentrated on celebrating the 50th anniversary of IMEKO's existence in a proper way. Let's look back upon the beginnings a little bit. The Hungarian Society of Measurement and Instrumentation concluded an agreement with corresponding societies in Warsaw and Moscow in 1958 about the joint organization of an international conference on measurement and instrumentation. After a careful preparatory activity this was done in November of the same year with the participation

of experts from 18 countries in Budapest. Encouraged by the success of the first really international event in this field further 9 countries wished to accede to the agreement. The Temporary Preparatory Committee was set up with 12 members to stage an international measurement conference in 1961 for an even wider circle. On the request of the Committee the Hungarian Society set up the IMEKO Secretariat in the Hungarian capital. The temporary committee became an International Preparatory Committee and Prof. Dr. György Striker, President of the Society was elected Secretary General.

The 1961 Conference – IMEKO II – already attracted 400 attendees from 25 countries. Recognising the gap caused by the fact, that the areas of measurement and instrument technology had no special representation among the existing international bodies, the Committee drafted a Constitution and By-Laws, which was signed in 1965 by the delegates of

14 societies (from the UK, Bulgaria, Czechoslovakia, Japan, China, Poland, the German Democratic Republic, the Federal Republic of Germany, Italy, Sweden, Romania, the Soviet Union, Hungary and the USA). IVA, the Royal Swedish Academy of Engineering Sciences invited the 3rd IMEKO Conference for September 1964 to Stockholm. IMEKO IV was in 1967 in Warsaw, where new Member Organizations from Egypt, France and the Netherlands were admitted and the French MO undertook hosting IMEKO V in Versailles in 1970. In Versailles the Austrian MO joined in.

After that, development was continuous, so in 2008 we are preparing for the 19th IMEKO World Congress to take place next year in Portugal, with 39 Member Organizations. Our basic tasks are accomplished by the 23 Technical Committees. The very first one was actually established in 1962 on Photon Detectors, followed by TC1 on Higher Education and TC3 on Measurement of Force and Mass, both in 1967. (It can not be traced back any more, why the TC on Photon Detectors was numbered TC2.) This short recollection of history would not be complete without remembering those who have been, through their devotion to the idea, instrumental in building up the Confederation to the level it is now, but can never again be with us: Prof. György STRIKER (1913-1992), who was once called in the US “the founding father of IMEKO” and indeed, considered IMEKO one of his greatest life achievements, as well as Prof. V.O. Arutjunov, Prof. H. Trebert, Mr. G. Ljungberg, Mr. J. Pelpel, Mr. Gy. Horváth, Prof. A. Bray, Prof. P. Görlich...

The list of Presidents: Prof. H.H. Trumpold, Mr. S. S. Carlisle, Prof. V.V. Karibsky+, Prof. T. Pfeifer, Mr. L. Kuhn+, Mr. G. Toumanoff, Mr. Meng Zhaoqian, Prof. G. Zin-

gales, Prof. O. Aumala, Dr. K. Iizuka, Prof. M. Peters, Prof. L. Van Biesen and our current President Prof. A.M. da Cruz Serra.

The list of Treasurers: Dr. H. Winkler+, Prof. J. Weiler+ and the current Treasurer Prof. P.H. Osanna.

Secretary Generals: Prof. Gy. Striker+, Dr. T. Kemény and the current Secretary General Prof. M. Borsic.

Some MO delegates and scientists with outstanding scientific and administrative contribution to the success of Congresses, symposia, conferences: Prof. L. Finkelstein, Prof. B.P. Veltman, Prof. E.-G. Woschni, Prof. Chr. Rohrbach, Mr. H. Wieringa, Mr. C. Göransson, Mr. P. Gilard+, Prof. F.H. Lange+, Prof. D. and Dr. G. Hofmann, Prof. J.V. Tarbeev, Prof. V.J. Kneller, Prof. A. Sowinski+, Prof. F. Mesch, Prof. F. Bernhard, Prof. J. Bozicevic, Prof. Th. Gast, Prof. T. Ono, Prof. L. Gonella+, Mr. W.A. Bajek, Prof. K.-H. Laermann, Prof. D. Barschdorff, Prof. M. Savino, Dr. J. Schanda, Mr. M.A. Yates, Mrs. J. Solt...

Thanks and high appreciations are due to all of them and our sincere apologies to those who could not be mentioned here. We extend a warm welcome to everyone who could follow our invitation to Budapest to remember and celebrate the 50th anniversary together with the presently active members of the IMEKO community. Please add your own thoughts and nostalgic remembrances at the Session.

Prof. Bernard P.Th.Veltman earlier long-standing Dutch delegate, who also actively contributed to the work of TC1 and TC7 in higher education and measurement theory spoke highly about the beginnings and the results. **Dr. Tamás Kemény**, former Secretary General gave a reminiscing presentation with special regard to his own expert field, measurement of force and mass (TC3). They both received warm appreciation.

The highlight of the recollections was a festive **banquet** in the evening of September 9 in typical Hungarian style where more praising speeches were held and presents exchanged.

The IMEKO Secretariat expresses its thanks to those who could be with us and share the joy. IMEKO is grateful for all the selfless support of the past 50 years.

The picture shows the nice gift received from the Japanese Member Organization:



Expanding Technology, Deepening Knowledge and a Shrinking World:

Reflections on Learned Societies in Measurement and Instrumentation

Prof. L. Finkelstein OBE FREng HonFInstMC

The paper marks the fiftieth anniversary of the activity of the International Measurement Confederation (IMEKO). It uses this landmark to examine the development of measurement and instrumentation science and technology in the last five decades. It notes a technology that has grown in capability, extended its range of applications and spread globally. It examines the change in economic and political conditions and a globalised world. It critically reviews the role of learned societies. It advocates effort to promote learned society activities. It views international co-operation in such activities as the only way forward. It advocates active engagement in the work of IMEKO.

Introduction

This year the International Measurement Confederation (IMEKO) is celebrating fifty years of activity. It is an occasion for celebration for all those concerned with measurement and instrumentation as science and practice.

IMEKO was founded in 1958 as a non-governmental federation of organisations working in the field of measurement and instrumentation, with the object of promoting international exchange of knowledge among scientists and engineers. It has grown to thirty-seven member organisations throughout the world. It has made a major impact on the status of the discipline.

The Confederation is governed by a General Council consisting of representatives of all its member organisations. It is led by a President, a Secretary General and a Treasurer. It has a permanent headquarters in the beautiful city of Budapest, headed by a Secretary.

There are triennial World Congresses, which are major events bringing together leading experts from around the world and marking the advances in the field. There are now twenty-three Technical Committees representing specialist interests. They range in scope from education and training and measurement science, to metrology in food and nutrition and chemical measurements. These committees organise international symposia of specialist interest between World Congresses.

The Confederation has a major journal, *Measurement*, published by Elsevier. The journal has increasing influence in the field. It publishes significant advances in the discipline.

There is close friendly co-operation between IMEKO and like international organisations in the field of control and information technology.

The Institute of Measurement and Control was one of the founding members of IMEKO and has exercised an influential role in its activities throughout its life. It is the voice of the UK measurement and instrumentation science and industry in this important international forum.

A Golden Jubilee, celebrating real achievement, could be used as an occasion for simple rejoicing and praise for those whose efforts brought us to this time. Both praise and rejoicing are appropriate and are here wholeheartedly expressed. However scientists and engineers use the achievement of significant stages in their work differently. They study their past analytically, they examine their present state critically and they set a target for the future.

It is in this engineering mould that the present tribute to IMEKO is cast. It is proposed to examine the science and technology that it represents, the transformation that it had undergone since the foundation of the Confederation, and the rapid changes that it is undergoing. It will look at the role of learned society activities. It will above all examine challenges of globalisation. From this it will put forward views on the future of international learned society activities in measurement and instrumentation and advocate engagement in them.

A basic and expanding technology

Measurement, the empirical objective assignment of numbers to objects and events of the real world is the essential tool by which humans describe the world and reason about it. The instrumentation by which measurement is implemented is the key enabling technology of modern civilisation. The science and technology is expanding. The technical means have changed radically and speedily over the last five decades and the rapid changes continue. There has been a dramatic increase in capability and cost-effectiveness, with progress continuing. The technology is used in an ever more extended and diverse range of applications. The drivers of this progress have been the push of technology and the pull of requirements arising from a rapidly changing social and economic environment. It is these facts that shape the present thoughts.

Historical development

When reflecting on the present and the future it is useful to be aware of the past. Measurement has its origins at the earliest stage of human development. Primitive humans counted and recorded numbers on heaps of stones and tally sticks. The earliest civilisations used measurement for trade, surveying and the determination of the calendar. The instruments used were relatively primitive. The rise of modern science, and of applications such as navigation, were enabled by advances of instrumentation and in turn led to advances

in measuring apparatus. With the advances of physical science an arsenal of apparatus and techniques has been developed to measure a wide range of physical variables.

By the middle of the twentieth century a number of developments could be said to usher in a new era. The first driver was the development of electronics. The use of electronics has led to structuring instrumentation as a system consisting of a sensor, which is acted upon by a measurand and produces an electrical signal representing the measurand. That measuring signal is then processed electronically to produce an appropriate output display or action. The second driver was the application of measuring instrumentation in automatic control. The design of control systems was based on a well-formulated and developed mathematical theory of automatic control. It drove the application of similar approaches to instrumentation. The applications of instrumentation outside the laboratory, in particular in process control and servomechanisms, became very significant.

It is at this stage of the development that there came to be a realisation that measurement and instrumentation is a distinctive and coherent discipline with a body of fundamental concepts and principles. The Society of Instrument Technology, as well as IMEKO, were founded at this stage of development.

The world into which they were born was very different from the world today; politically, culturally and economically. In middle of the twentieth century the economic system of most countries was based either on government planning and a command economy, or at least on significant government intervention. World trade was limited by barriers. Politically the world was divided into hostile ideological blocks, with difficulties in the creation and maintenance of scientific and cultural contacts. Travel was more expensive and difficult. These conditions shaped to some extent the development of technology and certainly governed the transfer of knowledge.

It may be confidently claimed for IMEKO and like organisations that they helped to dissolve international conflicts by creating personal friendship and understanding among scientists and engineers.

Technology Push

The technology of instrumentation has advanced rapidly in the last five decades and the progress is continuing, essentially transforming it. The principal driver of the advance has been the development of capability and cost-effectiveness of the hardware and software of information technology. In modern instrumentation, once information has been acquired by a sensor and represented by an electrical signal, the subsequent transmission and processing is implemented by standard techniques of information technology. This has greatly added to the capability of instrumentation. Linearisation, error correction and compensation can be simply implemented and machine intelligence features such as reconfiguration, adaptation and learning introduced. Instrumentation systems are increasingly based on sensor fusion and data mining. Image processing and tomography are significant examples of such developments. There is a convergence of instrument technology and information technology.

There has been substantial development of sensors. An increasing variety of variables can be sensed. Solid-state sensors incorporate to an increasing extent information processing functions in an integrated unit. Allied to this is the development of micro-electro-mechanical systems (mems), which is the integration of mechanical

elements, sensors, actuators, and electronics on a common silicon substrate through micro fabrication technology.

New modalities of information handling, such as optics have made a major impact.

The pull of requirements

The advances in the capability of instrumentation are meeting a pull of new requirements. In the middle of the twentieth century automation was the major goal of much application of instrumentation. It has continued to be a significant area, with for example, the development of robotics. However, a new world is bringing new requirements to the fore.

The problems of climate change and the need to preserve the environment present new challenges. All actions in these vital areas make demands on measurement and instrumentation.

One of most significant advances in application of instrumentation has been in medicine. Modern diagnosis is highly dependent on methods of measurement and its effectiveness has been advanced through the development of new forms of instrumentation.

Increasing wealth means a growing demand for the assurance of the quality of products. The measurement of quality is a major growth area. With global trade, high capability in metrology and the maintenance of international standards is demanded of all countries, including those that in the past did not have much activity in this discipline.

A changing political and economic environment

Technology is determined to a substantial extent by its economic environment. The prevailing economic system is that of the free market and global free trade. Both have a significant impact on measurement and instrumentation technology.

The market system means that economic considerations have primacy in design and development. The length of time between product initiation and introduction tends to become ever shorter. There is an emphasis on quality and a need for the product to be right when it is introduced into the market. Product life cycles tend to be short. All this demands a knowledge-based, effective design and development process.

Global free trade means that any product must be world-class to be effective. It demands international standards. Capital and technology are easily transferable from one country to another so that to any technical activity must be globally competitive to be viable. Manufacture can be simply transferred to countries with low labour costs. Knowledge and design capability provide the main competitive advantage.

The role of learned societies

Learned societies made the knowledge of the advancing technology public and through this contributed to its progress. IMEKO contributed to the international spread of technical knowledge, befitting humanity.

Knowledge base

The technology of measurement and instrumentation is thus extensive and diverse in its means and applications. It cannot be simply organised as a catalogue. It requires a structured body of concepts and principles. Such a body, measurement and instrumentation science, has been established and is continually being developed.

It is essentially based on viewing measurement as an information process and instruments as information machines. Measuring instrumentation is viewed as a system and analysed and designed using systems methodology. There is a convergence of measurement and instrumentation science and the more general science of systems, signals, information and control. There are, however, aspects of measuring instrumentation that are specific to it.

Measurement science is based on the establishment of standards and scales of measurement and their development, maintenance and dissemination. Analysis of uncertainty and its statistical treatment have a central role in measurement science. The understanding of uncertainty in measurement has been a major advance in recent times.

Whereas control and information systems are, in general, analysed and synthesised as functional blocs of components, measuring systems, in particular sensors and their interaction with the system under measurement, must be analysed and designed on the basis of their physical embodiment. Measurement and instrumentation science has systematic modelling of physical systems at its core. The last five decades have seen great advances in this aspect of science. It is now possible to formulate and implement in computers mathematical models that adequately predict the function of instrument elements and instruments such as sensors from a specification of their physical embodiment.

As the complexity and diversity of instrumentation has grown, so measurement science cannot give an account of all solutions to all problems. It must concentrate on principles of systematic design of measuring systems. The basis of these principles is the methodology of systems engineering. However, in measurement and instrumentation it also involves methods of generating design concepts based on the developing ideas of knowledge engineering and problem solving.

Finally there is increasing concern with logical and philosophical foundations of measurement. This is driven by the development of measurement in psychological and social sciences.

There is thus a sound scientific discipline of measurement and instrumentation science with a deepening knowledge base. It is distinctive, but it is part of a network of related disciplines. It shares many of its concepts and approaches to the sciences of systems, control and information. These disciplines are converging. Further, while systems, control and information are treated substantially at a high level of abstraction, without considering physical implementation, measurement and instrumentation is strongly based on the physical science of the measured object and with the physical realisation of equipment.

Learned societies were a key factor in the formation of measurement and instrumentation as an organised discipline. They achieved for it recognition. IMEKO has contributed to the establishment and international spread of that recognition and prestige.

Learned Societies

Claims have been made above for the significance of the role of learned societies in the advance of technology and knowledge.

The significance of this role is not acknowledged by all. It is thus proposed to discuss it in more detail.

Technology is essentially concerned with practice and not with the science that underlies it. It is in practice that most engineers are engaged. Advances in technology, while based on science, are driven generally by economic and like considerations and not by a desire to push forward the frontiers of knowledge. It may therefore be asked why the activity of learned societies should matter to technical professionals. On this occasion we may ask why the activity of an international learned society like IMEKO should matter.

There are excellent reasons why they do. Learned societies have been the basis of the advancement of human knowledge from the dawn of modernity.

Firstly, learned societies convert the experience of practice into organised knowledge. They do so by their publications and discussions, subjecting experience to analysis and criticism by peers. This makes knowledge more soundly founded.

All technology depends on people. People are formed through education and training. Learned societies are one of the principal mechanisms by which knowledge is shaped into teachable disciplines.

It is essentially through the free exchange of ideas that beliefs become validated knowledge. Learned societies are a proven mechanism for such activity.

In the modern world there are many pressures on the work of learned societies. They are involved in activities that do not immediately and directly profit those who pay for them. They produce knowledge that is free to anybody, including those who have not contributed to its generation. It is difficult to justify the resources expended to those who have to provide them. Nevertheless this justification must be made forcibly.

The individual professional may not immediately feel the benefit of learned society activities. But the status that membership of a profession brings ultimately rests on the learning that the profession possesses and this in turn is derived from learned society activities.

Businesses that are the ultimate providers of resources may think that they can be free riders. Knowledge, once published, is free. Any expenditure of resources that businesses incur in promoting public knowledge does not directly and immediately contribute to profit and may indeed benefit competitors. It is thus difficult for them to decide to spend money on supporting learned society activities. However, if all decide not to support learned society activities, these activities will atrophy. Businesses must understand that while the promotion of learning costs money, the tolerance of ignorance costs even more.

The output of learned society activities is then substantially what economic theory terms a public good. Such theory suggests that public goods are best provided by the state. However states are nowadays increasingly orientated towards business attitudes. They wish to be lean and mean. In any case to leave promotion of knowledge to direct state action is the road to serfdom. State support for learning is best achieved indirectly through learned societies and like bodies.

In the end, all having been said, it for those who work in learned professions to be the advocates of learning, to organise learning and to give of themselves to do so.

The traditional way of the functioning of learned societies is through meetings and publications. New technology provides competition to both these means. Communication through the Internet is a powerful means of exchange of information and ideas and of forming virtual communities of experts. Publication on the Web is

competing with journals. Learned societies need to confront these challenges. They have to change, but with the need to organise the exchange of ideas and to subject publication to peer criticism and review, there are powerful reasons to believe that they will continue to play a key role.

Notwithstanding the changes brought about by advance of telecommunications, technology remains a people activity. Learned societies are a forum in which people meet, friendships are formed and barriers are broken down. It is a mechanism that works well. We should not attempt to fix it in haste.

IMEKO for example has helped those taking part in its activities to form international contacts and friendships. It has promoted understanding of different cultural perspectives. It has launched young scientists on their careers and has taught them about world standards.

A shrinking world

We live in a shrinking world. Powerful instant means of communication and their impact have just been discussed. Travel is easy and relatively inexpensive. Political barriers to travel and cultural exchange are few. Higher education is becoming more uniform. In many ways there is a development of a global material culture. Not least we see the global influence of the English language, which has become the international means of communication in business, science and technology.

With these cultural influences, combined with the globalisation of the economy and the development of a single market for goods and ideas, at least in technology, we must rethink many attitudes. We can no longer think of science and technology in one country in isolation. We must think globally.

In particular we must remember that the world is changing as well as shrinking. We see the growth of the European Union. We witness the rapid advances in technology in Asia, first in Japan and now in China and India. We must remember the high level of Russian science.

While we must think of a globalised world, there continues to be a need to cherish national cultural identity, in science and technology as well as in other aspects of life. Diversity and strong local bonds strengthen the world. However these must be the basis of fruitful mutual influence and not a foundation for barriers.

Fortunately Britain has in modern times looked outwards to the world. Secure in its own culture and institutions, it has exercised great influence. It was open to new ideas and thought. It is thus particularly fitted to thrive in a globalised world.

The best form of learned society activities for the future is by co-operation of national organisations on a basis of equality. In the last fifty years IMEKO has been an exemplar of such co-operation.

Towards the future

With the jubilee of IMEKO we have reached significant a milestone. It also marks some fifty years of the general recognition of measurement and instrumentation as a distinct and significant discipline. Let us look forward to the future.

The technology of measurement and instrumentation has expanded in capability, in the range of its applications and in the geographical spread of its employment. It has built a sound basis of knowledge. It has gained wide recognition. Learned society activities and co-operation through IMEKO have been significant in these achievements.

We must strengthen our learned society activities reinforcing our strengths, eliminating weaknesses, exploiting opportunities and meeting threats and challenges.

We must work internationally. IMEKO offers the best platform for doing so. We should take an active part in the important tasks before it.

The author is Senior Research Fellow and Professor Emeritus in City University London. He was President of the InstMC in 1980. He was Member of the General Council of IMEKO 1982-2000 and Vice-President 1994-1997. He holds its Distinguished Service Award.

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We welcome your feedback!



Institute of Measurement and Control

MY 20 YEARS OF IMEKO – HISTORY AND PERSPECTIVES

Dr. Dan Mihai Stefanescu
Romanian Measurement Society
Romanian representative in IMEKO TC-3 and TC-17

The International Measurement Confederation was created in 1958 as a connecting bridge between the scientists from the Western and Eastern World being one of the few possibilities of cooperation during the Cold War. I had the chance to begin my activity as a national representative for IMEKO in a historical moment: the fiftieth anniversary of the Strain Gauge Techniques and Load Cells (Fig. 1 and 2) celebrated in 1988 in Houston [1].

1938 JUBILEE 1988
**Bonded Resistance Strain Gages,
Load Cells
and Brittle Coatings**
For Practical Measurements in the Field and Laboratory

PROGRAM

Special JUBILEE Sessions

Honoring the Inventors, Developers and Pioneers
Featuring the Spread of These Methods Worldwide



International Measurement Confederation's Xith World Congress – with

Instrument Society of America's

43rd Annual Conference and Exhibit

October 17-21, 1988

Houston, Texas

Jubilee Program: October 19, 1988

Astro Hall, Houston, Texas

Fig. 1. Official poster for Strain Gauge Jubilee in Houston, 1988



Fig. 2. Pete Stein and his guests for IMEKO XI, Houston, TX, 1988

After 1989 the possibilities of cooperation between West and East increased. Another historical moment was represented by the first Metrological Olympiad (IMEKO XIIth Congress) which was held in 1991 in Beijing much before the summer Olympic Games in 2008. In the group photograph (Fig. 3) taken at the opening of instrumentation exhibition one can notice among others: T. Kemeny (IMEKO), L. Finkelstein (City University of London), W. Bajek (ISA), M. Kochsiek (PTB), M. Kreuzer (Hottinger), R. Collay (BNM – France) and a lot of Asian colleagues.



Fig. 3. Opening ceremony of the IMEKO XII World Congress and Exhibition, Beijing, 1991

The Technical Committee no. 3 to which I belong is one of the most active, the list of conferences held between IMEKO congresses being shown in Table 1 [2].

Table 1. IMEKO TC-3 Conferences

No	Town	Country	Date
1	Braunschweig	F.R. Germany	1968
2	The Hague	The Netherlands	1971
3	Ostrava	Czechoslovakia	1972
4	Udine	Italy	1973
5	Szeged	Hungary	1974
6	Odessa	U.S.S.R.	1977, September
7	Braunschweig	F.R. Germany	1979, September
8	Krakow	Poland	1980, Sept. 9-11
9	London	U.K.	1983, Sept. 13-15
10	Kobe	Japan	1984, Sept. 11-14
11	Amsterdam	The Netherlands	1986, May 12-16
12	Szeged	Hungary	1990, Sept. 4-7
13	Helsinki	Finland	1993, May 10-14
14	Warsaw	Poland	1995, Sept. 5-8
15	Madrid	Spain	1996, Oct. 7-11
16	Taejon	Korea	1998, Sept. 14-18
17	Istanbul	Turkey	2001, Sept. 17-21
18	Celle	Germany	2002, Sept. 24-26
19	Cairo	Egypt	2005, Febr. 19-23
20	Ciudad de Mexico	Mexico	2007, Nov. 27-30

I took part in these exciting events starting from 1986. Here are some photos that illustrate the most interesting aspects.

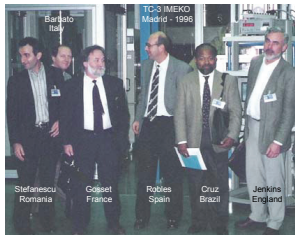


Fig. 4. TC-3 Conference, Madrid 1996



Fig. 5. TC-3 Conference, Istanbul, 2001



Fig. 6. TC-3 Conference, Cairo, 2005



Fig. 7. Social activities on the Nile, Cairo, 2005

IMEKO is also a co-sponsor of the specialized conferences in Asia (see the list in Table 2) as the metrology has an important development on this continent. The events in which I participated as a lecturer were marked in italics; the first was in Shanghai (Fig. 8). Among the European participants the specialists of PTB and Mettler-Toledo are noticeable.

Table 2. Asia-Pacific Symposiums on Measurement of Force and Mass (APMF)

No	Town	Country	Date
1	Beijing	China	1992
2	Tsukuba	Japan	1994
3	Beijing	China	1996
4	Taejon	Republic of Korea	1998, Sept. 14-18
5	Tsukuba	Japan	2000, Nov. 7-10
6	<i>Shanghai</i>	<i>China</i>	2003, Nov. 3-6
7	<i>Jeju Island</i>	<i>Republic of Korea</i>	2005, Aug. 30 – Sept. 3
8	Sydney	Australia	2007, Oct. 24-26
9	<i>Tokyo</i>	<i>Japan</i>	2009, June 1-4



Fig. 8. Asia – Pacific Mass and Force Symposium, co-sponsored by IMEKO, in Shanghai, 2003

Organizing conferences at which other technical committees are affiliated becomes usual for TC-3, the last example being the International Conference on *Cultivating Metrological Knowledge* held in Mexico – 2007 and joining TC-3 (Force, Mass, Torque and Density), TC-16 (Pressure an Vacuum) and TC-22 (Vibrations).

The activity of some specialists is remarkable inside many different TCs, because complex measuring processes are referring to various types of measurands. For example, the global vision of Attila Naszlady defines the power from four different angles (Fig. 9), illustrating the energetic transformations that can take place in the Universe [3].

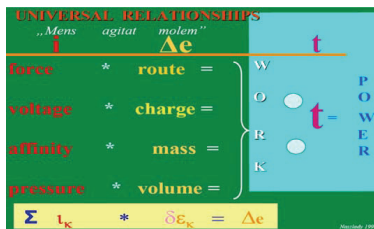


Fig. 9. Different definitions of power

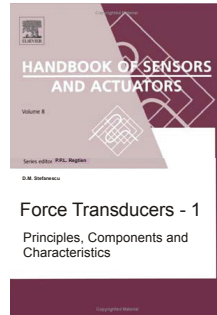


Fig. 10. Elsevier cover.

Also we try a unified approach treating the force measurements in a close connection with other mechanical quantities [4]. From this point of view the emerging "Handbook of Force Transducers" (Fig. 10) will show a classification of the measurement principles and of the elastic elements along with a wide range of applications addressing to all the Technical Committees from IMEKO [5].

References

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4. Stefanescu D.M. *Strain gauged elastic elements for force and related quantities measurement*. CD Proc. IMEKO TC-3, 16 and 22 Int'l Conf. on *Cultivating Metrological Knowledge*, Paper 22, Merida, Mexico, 27-30 Nov. 2007.
5. Stefanescu D.M. *Handbook of Force Transducers: Vol. 1 – Principles, Components and Characteristics; Vol. 2 – Applications*. Elsevier, Amsterdam, in preparation.

Other matters discussed at the 50th (held in Paris, France, September 2007) and at the 51st General Council Session:

IMEKO is pleased to announce the admission of **new Member Organizations**: the Kazakhstan Institute of Metrology and the Rwanda Bureau of Standards in 2007 and the National Measurement Institute of Australia, as well as the Serbian Society of Metrologists in 2008. We have 39 MOs at present.

New Technical Committee: TC24 – on Chemical Measurements (established in 2007) under the chairmanship of Dr. Philippe Charlet, France.

At the 50th Session, Prof. Roland Collay, French GC delegate was appointed **Chairman of the Credentials and Membership Committee**, upon the death of **Mr. Don Tallantire** some weeks before.

Don has been associated with IMEKO for decades, as a UK GC delegate and also in charge of the MEASUREMENT journal. He was already involved in the organization of the 7th IMEKO Congress in London, 1976. He was very much liked for his quiet friendly manner. *We miss you, Don, rest in peace!*

New Chinese delegate to the GC: Mr. Wang Shunan, Secretary General of the Chinese Society for Measurement. **New UK delegates:** Prof. Ron Summers, President of The Institute of Measurement and Control and Mr. David Kent. It is expected that also Prof. Ken T.V. Grattan remains on the Council.

New TC Chairman: Dr. G.W. Bahng, South Korea for TC5 – Hardness Measurement, upon the retirement of Dr. Konrad Herrmann, Germany.

KASTO, the Korea Association of Standards and Testing Organisations has transferred South Korean membership in IMEKO to **KRISS**, the Korea Research Institute of Standards and Science.

IMEKO XX – the 20th IMEKO World Congress will be organized by KRISS in the city of Busan under the title *Metrology for Global Harmonization* in 2012 (probably in May).

The **52nd IMEKO General Council Session** and related meetings will be during the 19th World Congress in September 2009 in Lisbon, hosted by the Portuguese MO. The election of Officers, Boards and Standing Committees for the next triennium will be on the agenda. The same goes for the budget and general financial arrangements. Dis-

tinguished Service Awards and the György Striker Junior Paper Award will be handed over at the Closing Session of the Congress.

The **Advisory Board**, the **Technical Board** and the **Editorial Board** of the Journal MEASUREMENT met on September 8, 2008 to review activities of the past year and make plans and recommendations for the next, including the approval or tentative approval of Technical Committee events and TC Officers. The possible revival of TC6 – Vocabulary Committee may be considered in the future. (Activity was suspended.)

Event Calendar

2008

TC8 – Traceability in Metrology

TC21 – Mathematical Tools for Measurement

Conference on Traceability to Support CIPM MRA and other International Arrangements

Torino, Italy

November 6-7

Contact: Dr. Carlo Ferrero

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10135 Torino, ITALY

Phone: +39 011 3919 752

Fax: +39 011 3919 383

E-mail: c.ferrero@inrim.it

TC11 – Metrological Infrastructures

Workshop on Metrology, Testing and Accreditation Breaking the Trading Barriers

Dubrovnik/Cavtat, Croatia

November 12-15

Contact: Prof. M. Borsic

Croatian Metrology Society

Berislaviceva 8

10000 Zagreb, CROATIA

Phone: +385 91 523 10 47

Fax: +385 1 464 8262

E-mail: mladen.borsic@hmd.hr

www.rmo2008.org

2009

IMEKO XIX – 19th IMEKO World Congress
FUNDAMENTAL AND APPLIED METROLOGY

Lisbon, Portugal

September 6-11

Contact: Prof. P.S. Girao
Laboratorio de Medidas Electricas
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Phone: +351 21 8418473
Fax: +351 21 8417672
E-mail: psgirao@ist.utl.pt
www.imeko2009.it.pt

See you there!

Co-sponsorships:

Sensor+Test 2009 – The Measurement Fair

Nürnberg, Germany

May 26-28

Contact: AMA Service GmbH
Ms. Christiane Schild
Von-Münchhausen-Str. 49
31515 Wunstorf, GERMANY
Phone: +49 5033 9639-0
Fax: +49 5033 1056
E-mal: info@sensorfairs.de
www.sensorfairs.de

**APMF 2009 – Asian-Pacific Symposium on Measurement of Mass,
Force and Torque** (TC3)

Tokyo, Japan

June 1-4

Contact: Mr. K. Ueda

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2010

TC3 – Measurement of Force, Mass and Torque

TC5 – Hardness Measurement

TC22 – Vibration Measurement

21st Conference on Measurement of Force, Mass and Torque / HARDMEKO 2010 /

2nd Meeting on Vibration Measurement

Pattaya, Thailand

November 21-25

Contact: Dr. Pian Totarong, Director

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Further events tentatively approved for 2010: by TC1 – Education and Training in Measurement and Instrumentation and TC7 – Measurement Science in the UK; TC2 – Photonics in China; TC9 – Flow Measurement in Taiwan; TC14 – Measurement of Geometrical Quantities in Japan; TC16 - Pressure and Vacuum Measurement in Germany and TC18 - Measurement of Human Functions in the Czech Republic.

NEWS in brief

SEM – the Society for Experimental Mechanics, Inc. scheduled an International Symposium to Commemorate the 60th Anniversary of the Invention of Holography at Springfield, Massachusetts, USA, October 27-29, 2008

<http://sem.org>

CISSE Online E-Conference – The Fourth International Joint Conferences on Computer, Information and Systems Sciences and Engineering – technically co-sponsored by the Institute of Electrical & Electronics Engineers (IEEE), University of Bridgeport, December 5-13, 2008

<http://www.cisse2008online.org>

The 14th International **Metrology Congress** will be organized by the French IMEKO MO in Paris, June 22-25, 2009

www.cfmetrologie.com

Another interesting event still in 2008: the BioFuels and Metrology Symposium on November 6-7 in Strasbourg.

The 9th International Symposium on Measurement Technology and Intelligent Instruments – **ISMTII – 2009** – will take place next year in Saint-Petersburg, Russia from June 29 to July 2

www.tdisie.nsc.ru/ismtii2009

Our Mexican colleagues at the National Centre of Metrology (**CENAM**) stage a Metrology Symposium every two years, this year from 22 to 24 October in the city of Queretaro.

<http://www.cenam.mx/simposio2008/>

The 1st International Congress on **Mechanical Metrology** organized by the Brazilian IMEKO community was in Rio de Janeiro from 8 to 10 October, 2008
www.inmetro.gov.br

Mr. Karl Ruhm, Swiss IMEKO GC delegate at the Zurich University of Technology, Measurement and Control Laboratory regularly offers courses on **Measurement and Sensor Technology**. Inquiries:
ruhm@ethz.ch

Mr. Ruhm conducted a survey within IMEKO about the interpretation of the term “metrology”. More about the results in the next issue of IMEKO Bulletin.

Date and place for the 7th International Conference on **Modern Practice in Stress and Vibration Analysis** of the Stress and Vibration Group at the Institute of Physics: September 8-10, 2009 in New Hall, Cambridge, UK
www.mpsva2009.org

The **Union of International Associations** – UIA is celebrating its centenary. Founded by the visionaries Paul Otlet and Henry La Fontaine, a small group of dedicated and quietly passionate people have been diligently discovering, documenting and disseminating information on international associations and their activities, including IMEKO’s. The Yearbook of International Organizations contains data of over 60000 civil societies active in every field of human endeavour and over 900000 links between them.
www.uia.org

Our Readers’ attention is called to the Sensors & Transducers Journal. Editor-in-Chief: Sergey Y. Yurish – e-mail: editor@sensorsportal.com or syurish@Omega.UAR.Net

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