IMEKO

Challenges and Visions of the '90
The Finnish Perspective

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The Finnish Perspective

First edition

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Preface

There are times when everything seems to take on a new meaningfulness. The challenge when risks and obtainable values are simultaneously high can make the work memorable.

In the history of IMEKO this happened in the early nineties. There were great changes in international politics, and economics followed with difficulties and instability. The basic idea behind IMEKO seemed to vanish, and yet the international scientific forum was able to offer high values.

In these days, the Finnish MO was chosen to arrange the XIV IMEKO World Congress. The task was seen as a big challenge indeed. There was no promise of success, both financially in terms of participation. The Finnish team worked out a plan that was financially cautious but tried to develop a very high innovation profile. The first IMEKO web service was launched; it also contained the Congress web site; members of the core team offered high personal impacts; the professional skills of the Congress Secretariat were used in marketing; students and voluntary work were utilized extensively.

The result was successful! The participation was better than ever before. Young scientists were participating in much greater numbers than could be expected.

Afterwards, our activity was recognized with a Distinguished Service Award. Every member of our organizing team had contributed to earning this award. Even afterwards, all key members participated in writing this collection of memoirs. I extend my sincere thanks to them and also to the active and helpful Secretariat.

Tampere, 13 July, 2009.

Olli Aumala
Delegate of Finnish Society of Automation
IMEKO President 1994-1997
Holder of the IMEKO Distinguished Service Award
Honorary member of IMEKO Advisory Board
Honorary member of Finnish Society of Automation

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Finnish Society of Automation joins IMEKO

Founding and objectives of IMEKO

IMEKO was founded by a group of enthusiastic men in 1958. The founding members were Hungary, Poland, France, Sweden, the Soviet Union and the United States of America. IMEKO (International Measurement Confederations in full) was to be a nongovernmental organization of scientists and engineers working on Measurement Science and Technology. One of its principal purposes was also to construct a bridge over the Iron Curtain for scientific cooperation.

The headquarters of the Confederation was established in Budapest, and it is still there. The first two Congresses were held in Budapest in 1958 and 1961. The soul of the new group was Prof. György Striker, who had studied and worked in USA but came back to Hungary to build up the Hungarian instrument industry.

IMEKO developed rapidly into a remarkable international body and was given consultative status with UNESCO and UNIDO. It is also one of the five Sister Federations within FIACC: the Five International Associations Coordinating Committee, further consisting of IFAC – International Federation of Automatic Control, IFIP - International Federation for Information Processing, IFORS – International Federation of Operational Research Societies, and IMACS – International Association for Mathematics and Computers in Simulation. The number of IMEKO member societies grew to over 30, each representing a different country through their nominated delegates on the IMEKO General Council. IMEKO executes its goal mainly through its Technical Committees (TCs).

The Club of Industrial Instrumentation and Control – Teollisuuden Mittaus- ja Säätöteknillinen Kerho – was founded in 1953 as a club of experts in measurement and control engineering. The term ”control engineering” was understood to include measurement technology, instrumentation, system technology, and automation. Its successor, the Finnish Society of Automatic Control - Suomen Säätöteknillinen Seura (SSS) – was registered in 1957 and founded in 1958. In 1990 the name changed to the Finnish Society of Automation – Suomen Automaatioseura ry. (SAS). In the very early years of IMEKO, its existence was also noticed occasionally by some members of SSS.

Finland joins IMEKO

The proposal for the Finnish Society of Automation to join IMEKO was adopted by Olli Aumala in 1974. Aumala had been nominated for professor of measurement technology at Tampere University of Technology, and he wanted to build up international contacts with colleagues. The Society decided at its general meeting to apply for membership and to nominate Aumala as its delegate to IMEKO. Unfortunately the application came too late to be examined by the Credentials and Membership Committee of IMEKO, and Aumala was acting as an observer at the meeting of IMEKO General Council in Budapest in May 1974. The application for membership was then accepted unanimously at the next GC meeting in London in 1975. In fact, Aumala was chosen at once as a member of the Credentials and Membership Committee. Perhaps the wooden sauna thermometer handed over in Budapest "for measuring the heat of the activities of the Secretariat" made the decisive point!

Aumala then served as the Finnish delegate for 16 years until he was nominated for President Elect (Chairman of the Technical Board) 1991–1994, President of IMEKO 1994–1997 and Past President (Chairman of the Advisory Board) 1997–2000. He set up a national group from universities (Tampere University of Technology), research institutes (State Research Centre, Technical Inspectorate), and industry (Lahden Vaaka Oy, Valmet Corporation) forming a small network for cooperation.

Background for the XIV World Congress

Critical state of affairs in Beijing

The IMEKO XII World Congress in 1991 was held in Beijing, China. The international situation was critical. There was a global economic low, and the Iron Curtain had recently collapsed. It appeared that IMEKO perhaps was no longer needed as a bridge across the curtain. There was an identity crisis.

IMEKO still asked its member societies for applications to hold a World Congress in 1997. It had already been decided to hold the XIII World Congress in 1994 in Turin, Italy.

During the first ten years of its IMEKO membership, the Finnish Society of Automation (SAS) did not hold any IMEKO conferences. After this quiet period Finnish members of IMEKO Technical Committees however ”woke up”. SAS organized symposia and workshops in several areas: TC3 (Workshop Force-85 in 1985; the 13th Conference on Measurement of Force and Mass in 1993, A. Pusa), TC8 (Metrological Assurance for Environmental Control in 1988, U. Lähteenmäki, 22 papers), TC10 (7th Symposium on Technical Diagnostics in 1990, A. Villanen and S. Kuismanen, 3 Keynote papers and roughly 65 papers), TC12 (4th Symposium on Temperature and Thermal Measurement in Industry and Science 1990, H-K. Graubner) and TC14 (4th Symposium on Dimensional Metrology in Production and Quality Control in 1992, H. Tikka).

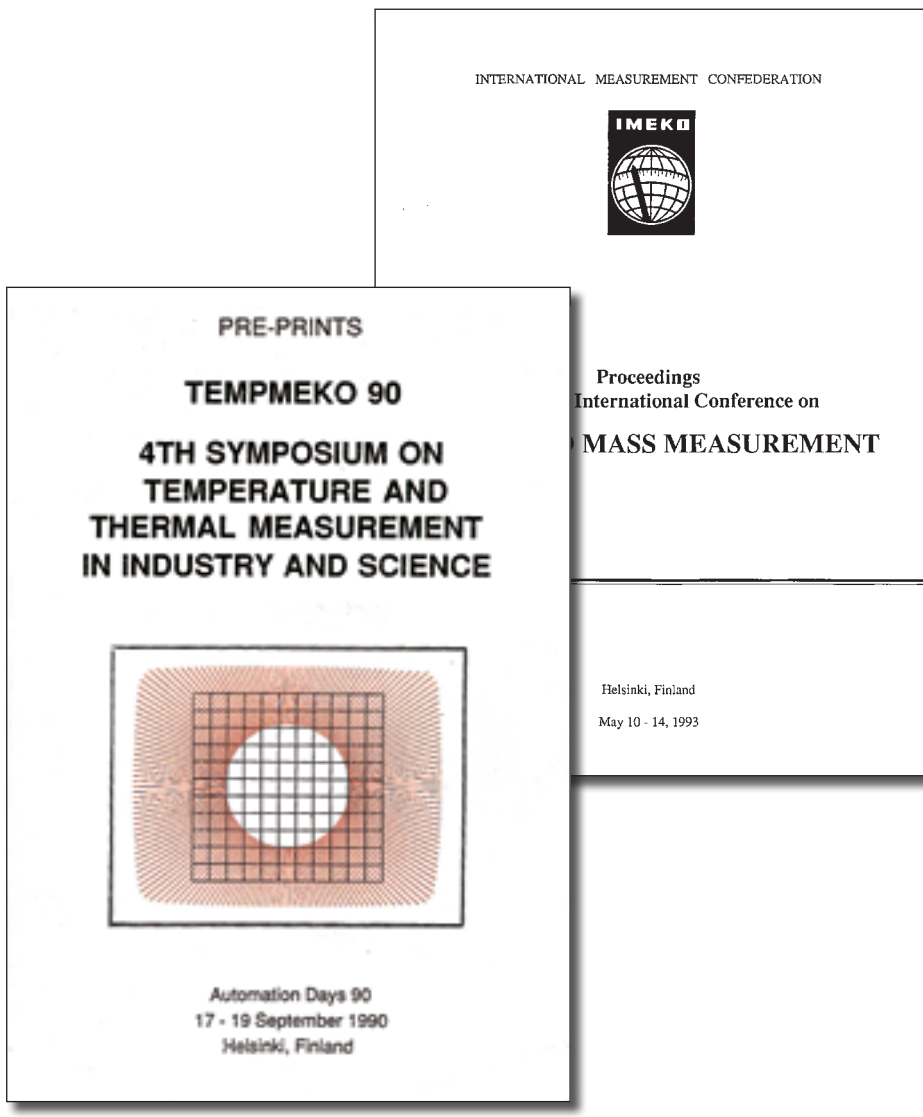
This activity was the background when Aumala asked the audience at the Finnish Automation Days in 1990 whether SAS should finance and work for the World Congress of IMEKO in 1997. Statistically, such a Congress would come to Finland once in a century. The willingness of the audience was apparent, and the Board of SAS decided to apply for the Congress. They realized that this would be a major and very demanding organizational task, but it also had a firm conviction that this task could be fulfilled successfully with the willingness of the key members and the experience of the SAS Secretariat.

The Finnish delegation of 12 persons travelled to Beijing. The written application had been sent in good time. When we arrived we heard that there was also another application: Spain had applied.

The President set up a special Working Party for studying the applications. According to memory, all three presidents (that is, President Z. Meng, Chairman

of the Technical Committee G. Zingales and Chairman of the Advisory Board G. Toumanoff) as well as Secretary General T. Kemeny questioned the delegates of the applicants and put a proposal to be decided. The General Council then "resolved to accept with warm thanks the invitation of the Finnish MO because of the long connection of that MO with IMEKO and because of their successful experience of organizing IMEKO events".

So, we had plenty of distinguishing work as well as an economic challenge in our laps. Aumala got immediately the duty to chair the Technical Board and to lead the activities of the Technical Committees.



Towards the presidency and the XIV World Congress

Up to the 1990s, IMEKO had developed as planned since its birth in 1958. It was the scientific and technological forum for measurement science and technology, a bridge between east and west. In the beginning of the new decade, the financial limitations of IMEKO, partly caused by the political turmoil in Eastern Europe, had begun to erode the execution of broader visions of IMEKO's role in the rapidly expanding measurement technology sector. It was felt that a new direction was needed.

In 1990 there were in all 31 member organizations representing an equal number of countries. The Finnish member organization, the Finnish Society of Automation, had been a member of IMEKO since 1975 as a result of Olli Aumala's enthusiastic personal devotion.

IMEKO's field activities were executed by Technical Committees. New findings in measurement technology were published in IMEKO's "Measurement" Journal and World Conference Proceedings. IMEKO Bulletin spread current news from IMEKO. At the turn of the decade there were in all 16 technical committees, and the Finnish Society of Automation was active on 10 of those. The supreme governing body was the General Council supported by the advisory and technical boards as well as some other bodies.

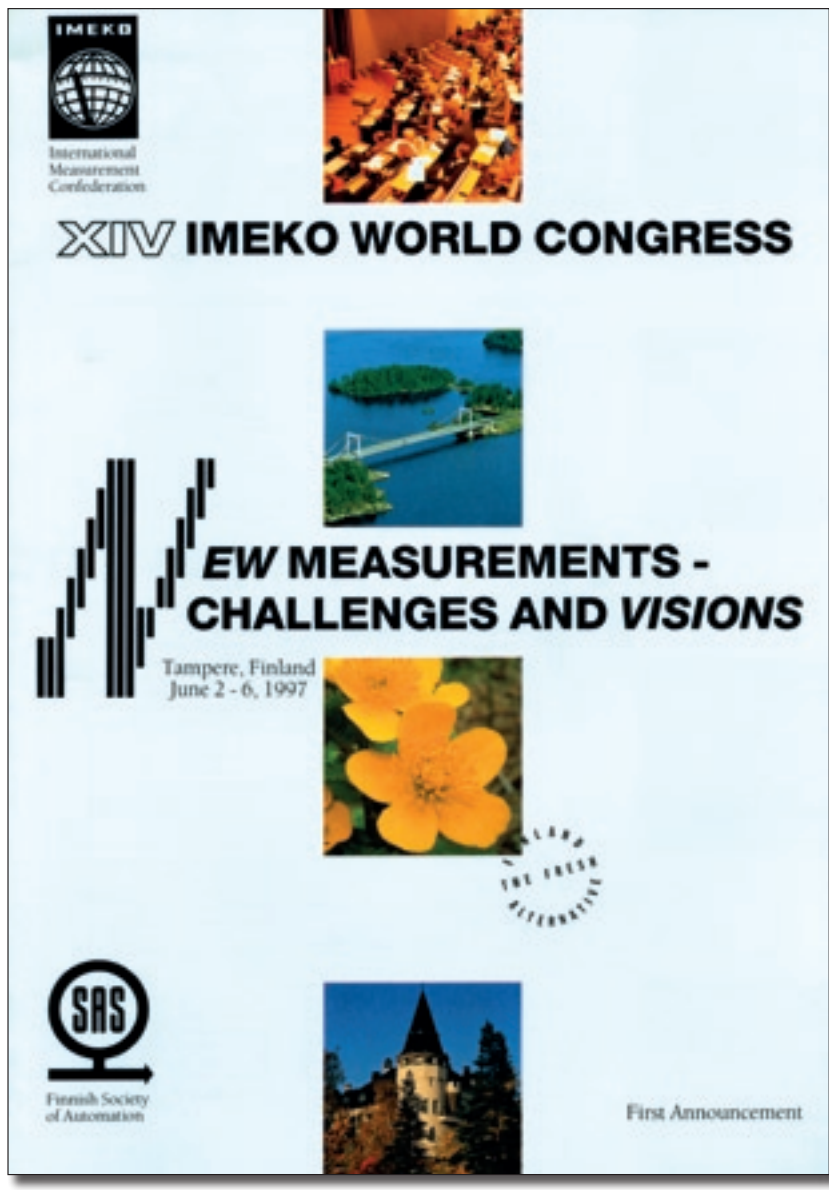
In 1991, at a General Council meeting, the GC accepted the invitation of the Finnish member organization to hold the XIV World Congress in Finland. Consequently, Olli Aumala was nominated president elect and chairman of the technical board. Before his nomination Aumala had been a member of the advisory board since 1988, a member of several technical committees and had acted for 16 years as the Finnish delegate to the General Council. Succeeding Olli Aumala from 1991, the Finnish delegates were Aimo Pusa and Paavo Tuomi.

Further, Aumala had been chairman of the advisory board 1997–2000 and secretary to the board 2000–2003. In 2003 the General Council nominated him honorary member of the advisory board. It was the first time such a member had been nominated in the history of IMEKO.

Preparations for the XIV World Congress were initiated rapidly by Finnish Society of Automation. In January 1992 first three key operators were allocated by the Board of the MO to run the project. Olli Aumala was nominated as the

person responsible for IMEKO, Aimo Pusa as the chairman of the organizing committee, and Paavo Uronen as the chairman of the program committee. A number of supporting persons were immediately available due to the fact that an ”IMEKO support ring” had been active since 1985.

In an attempt to help the IMEKO secretariat with its financial and operative pressures, the Finnish Society of Automation had internal discussions about the possibility to offer a home to the IMEKO secretariat in Finland. The Finnish



Ministry of Trade and Technology decided to support the Finnish member organization's activities and responsibility in the IMEKO framework. Its support was mainly applied for international activities devoted entirely to preparations for launching activities of the chairman of technical board and president elect.

In addition, the Academy of Finland, Finnair, IVO, Nokia Corporation, and Valmet Automation among others, supported the activity of the Finnish member organization in its endeavours to support IMEKO in its search for a new direction and in preparing the Finnish MO's readiness for the XIV World Congress. It was felt that there were great challenges ahead of us. It was also asked whether there would be resources and enthusiasm enough in forthcoming years to execute the visionary views. When the launching of chairman of the technical board activities and preparations for the XIV World Congress started, it was quickly found that fast communication facilities and proper methods to avoid the rising probability of overlapping work in the technical committees were needed. To help to solve these problems, Finnish MO members developed the Scientific Expertise System SES. The aim of the SES was to preserve the data of experts in measurement science and technology globally. System programming and basic data collection were carried out by the Finnish MO's members at Tampere University

In Turin left Olli Aumala, TUT, Maarit Mikkola, Tampere Hall, Aimo Pusa, Raute Precision.

of Technology. The programme's "public beta version" and documentation were expressed for IMEKO in the beginning of 1995 for further development and updating. The "beta version" contained data from 422 experts. Overlapping interdisciplinary problems were also to be taken into account in the new technical strategy.

During the XIII World Congress in Turin, Italy, September 1994, the General Council elected Olli Aumala the new president of IMEKO till the end of XIV World Congress to be held in Tampere, Finland in 1997. On behalf of the Finnish MO, Aumala expressed his warm welcome to all participants to attend the XIV World Congress. Finland was represented in Turin by 12 lecturers and other representatives of the Finnish MO.

In search of a new strategy for IMEKO

By the late 1980s and early 1990s it was already observed that measurement science and technology as well as industry attitudes were rapidly changing. New applications and technology foundations were emerging. Some "new generation" interdisciplinary application areas were already launched, including wireless measurement, medical and nanotechnology applications, as well as measurement and control applications on the solar and stellar system scale. It was noticed that IMEKO should be capable of responding to these challenges globally. Referring to these examples it was also stated that IMEKO needs to be the pioneering forum for new measurement. A new direction strategy for IMEKO was to be formulated and executed.

A special task force on "mission, strategy, organization and finance" was appointed by the advisory board in 1994 under the charge of Prof. L. Finkelstein (UK). The members of the task force were W. Bajek (USA), K. Iizuka (Japan) and the newly elected new president of IMEKO, O. Aumala (Finland). The task Force had six months to do its job. As a part of the new direction search, the creation of a new technical strategy, which had been in preliminary development since 1992, was also included in the programme. The goal of the technical strategy work was to describe a strategy for IMEKO technical operations to suit current and future technological developments, taking into account not only the rapidly changing measurement technology itself but also the increasing impact of industry on scientific research. It was felt that IMEKO and its technical committees have lived too much in ivory towers and should open their windows more to the outside world. IMEKO was not known enough in the outside world to be proportionate to its output potential. The chairman of technical board, Olli Aumala, had been in charge of creating the technical strategy.

The Finnish member organization also joined the task force work in formulating its comments on viewpoints which should be taken into account in the new direction plan for IMEKO. As a response to a request concerning the report of the task force on mission, strategy, organization and finance, the Finnish delegate to the General Council drew all parties' attention to certain points which the Finnish MO considered important. "The task force analyzed the current organization and operations of IMEKO and on that basis formulated a mission statement which represents what the organization works for at present. The TF believes that the mission statement is valid, and represents a sound basis for the organization. Our opinion is much the same." However, it called for a more explicit stipulation as "IMEKO is the international forum for advancements in measurements and instrumentation science and technology and source of knowledge for the industry applying measurement technology" "IMEKO has been living in a very turbulent period in its development. Discussions concerning the constitution, bylaws, and rapid changes in the surrounding world, as well as the effectiveness of IMEKO and financial difficulties have clearly impacted on the working environment. These conditions were reasons to set up the Task Force. We believe that IMEKO is not going to live in such turmoil currently and this view has an effect on our comments and suggestions."

Further it was noted that "IMEKO is in its financial nature a service-provider and consultant community in its relation to the outside world. MOs are the "external customers" of IMEKO; even they have delegates and possible officers within IMEKO. Most of the MOs were willing to pay for services and business opportunities created by IMEKO in the form of yearly membership fees and congress fees. Only an "external customer" of IMEKO is the "umbilical cord" through which IMEKO is fed with the energy to run its operations. MOs and their members must be satisfied with the quality of services... In these hectic days of "building new IMEKO" comments continued: "IMEKO is an international pathfinders' community and should act aggressively and be visible as the consultant for different regionally and globally influential organizations operating on different continents. These organizations are influencing the position of measurement science and technology, for instance in education, etc. ... Taking into account the global operating area of IMEKO, it calls for effective communication at least between all officers and the secretariat. However, it does not call for immediate proximity of those due to the present means of communication. It will herewith be placed for your consideration whether "IMEKO Area Vice Presidents" selected from each potentially active continent would assist in developing IMEKO activity in the area in question…" In the hands of Prof. Finkelstein, the report of the job was formulated and supplied for approval to the Advisory Board at the end of 1995.

Seen from the rear-view mirror

Here we have a short review about the arrangements for the XIV IMEKO World Congress in Tampere.

Changes of personnel

In the busiest phase of the pre-arrangements for the congress Leena Vahtera (formerly Antikainen), decided to take a job at the University of Lapland. Pirjo Venäläinen, who had no experience of arranging international congresses, let alone world congresses, was chosen to take charge of Vahtera's duties. Marianna Lottonen, secretary trainee at the time, was given the possibility to go on working, as she already had experience of international events. Yet in the rushed last year Marianna took her maternity leave and Mari Hiltunen from the same educational institution was hired. A change of personnel took place in the financial management as well. Training the personnel became fairly important. This taught us that for every event there must be an operational chart and adherent training material to make possible changes of personnel more flexible.

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New tools for IMEKO

When the General Council assembled for its 37th meeting during the XIII World Congress in Turin in 1994, it paid special attention to the financial difficulties. Due to the global economic recession, some Member Organizations had not paid their membership contributions, and also the royalties from some previous congresses were late.

The GC set up a Task Force to "examine the objectives, organization, activities and funding of IMEKO and to make recommendations, reporting to the Advisory Board within 6 months". The task Force was chaired by L. Finkelstein (UK, Vice-President and Editor-in-Chief of Measurement), other members were O. Aumala (FI, President), W. Bajek (USA, member of AB) and K. Iizuka (JP, President Elect, Chairman of Technical Board). The Task Force presented a detailed report which was discussed by the AB and GC in Stockholm next year. There was a common understanding that a new strategy was needed, the duties of the key officers needed to be clearly defined, and new forms of operations as well as new tools for working should be developed. Unfortunately, the GC felt that the discussion should be deferred to 1996.

The Finnish Society of Automation, in cooperation with Tampere University of Technology, had meanwhile developed two new tools that were already in use but required constant updating: Olli Aumala himself built up the first IMEKO website, on the server of Tampere University of Technology. In those days data transfer to faraway sites was rather slow, and consequently the site was constructed in a concise format. Nevertheless there was a set consisting of member organizations, technical committees, administration, coming events, and a structured (and from time to time developing) sub-sites for the upcoming World Congress. In the last few weeks before the Congress there was even a "discussion forum" where one could contact authors and raise questions about their papers. This forum was used for other purposes, too; participants were even talking about having a glass of beer together!

A databank called IMEKO Expertise Service was also developed. Looking back now, one can see that the website could raise interest and increase participation particularly of young scientists at the XIV World Congress in Tampere. The Expertise Service was constructed as an academic Diploma Thesis at Tampere University of Technology. It was given to the Secretariat and received by the GC with enthusiasm. It was used also by the journal Measurement for finding proper reviewers for manuscripts, but unfortunately it could not be updated properly. The Secretariat was not used to working with computer databases.


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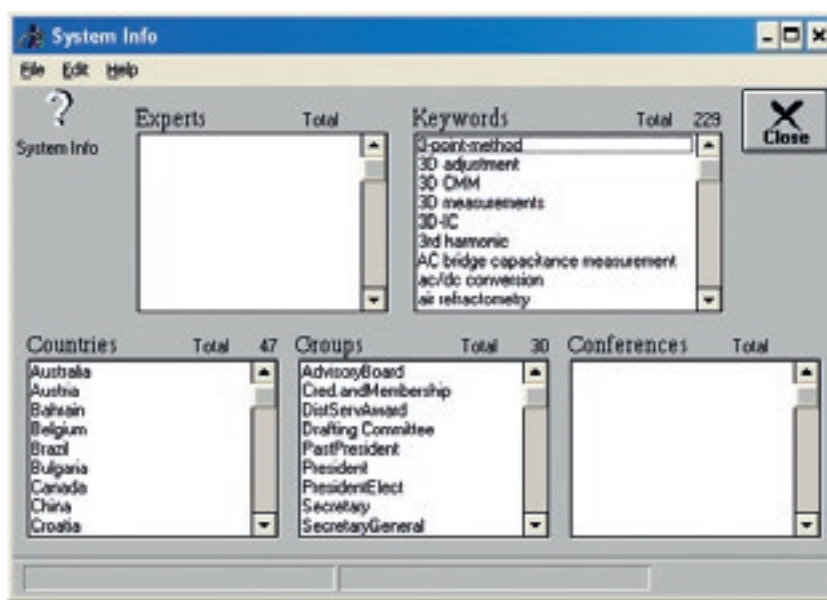
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Secretary
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Introduction of the core team of XIV IMEKO World Congress

There have been dozens of people working to reach the goal of arranging the XIV IMEKO World Congress in Finland in 1997. The core team of experts, however, consisted of Olli Aumala, Aimo Pusa, Jouko Halttunen and Paavo Tuomi. Here we have some background and information about these active Finnish members of IMEKO.

Activities of Olli Aumala in IMEKO

- IMEKO Delegate 1975–1991
- IMEKO Committee, Chairman, 1982–2005
- IMEKO Symposium on Metrological Assurance for Environmental Control, National Organising Committee (NOC), Member, 1988
- IMEKO TEMPMEKO, NOC, Member, 1990
- IMEKO Symposium on Technical Diagnostics, NOC, Member; International Programme Committee (IPC), Chairman, 1990
- IMEKO TC 7, Measurement Science, Member, 1993–
- President Elect of IMEKO, Chairman of Technical Board, 1991–1994
- President of IMEKO, 1994–1997
- IMEKO ADC Workshop, Responsible person, 1996
- IMEKO ADC97 Workshop, Organising Committee, Member, 1997
- XIV IMEKO World Congress, NOC and IPC, Member, 1995–1997
- Designer of IMEKO Pendant, 1997
- Past President of IMEKO and Chairman of the Advisory Board, 1997–2000
- IMEKO Virtual Workshop on Tools for Education in Measurement, NOC and IPC, Member and Editor, 2001
- IMEKO On-Line Virtual Workshop on Tools for Education in Measurement, LOC, IPC, Chairman and Editor, 2002
- IMEKO Advisory Board, Secretary, 2000–2003
- IMEKO TC1, Education and Training in Measurement and Instrumentation, Member, 2001–
- IMEKO Advisory Board, Honorary Member, 2003–

Professor Olli Aumala was born in 1939. He received his M.Sc. degree (Diploma Engineer) at Helsinki University of Technology in 1962, Licentiate of Technology at Tampere University of Technology (TUT) in 1974 and Ph.D. degree (Doctor of Technology) at TUT in 2001.

Aumala worked for Oy Strömberg Ab in Helsinki as Design Engineer 1962–1967. After that he worked for Valmet Oy Instrument Works in Tampere as

Research Engineer and Head of Department of Product Development 1967–1971. Then he moved to Karhula, because he got the position of Chief Project Engineer in Electricity, Automation and Telecommunication at A. Ahlström Osakeyhtiö 1971–1972. 1973–1974 Olli Aumala acted as Department Head of Biotechnology at Valmet Oy Instrument Works in Tampere. His academic career at Tampere University of Technology as Professor of Measurement and Information Technology began in 1972 until he retired in 2002.

Professor Aumala has written many books and publications about the fundamentals of measurement technology, measurement signal processing, measurements of industrial processes, metrological automatic support of measurement results in intelligent measurement systems, turning interference and noise into improved resolution, IMEKO – public and tactile information distributor, etc.

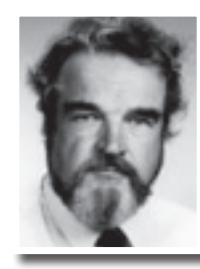
Olli Aumala has been a member of the Editorial Board of Measurement, Chairman of Standardising Committee for Basic Terminology in Metrology, a member of the Advisory Commission for Metrology, and Vice Chairman of the Board of Centre of Metrology and Accreditation in Finland.

He is a member of the Finnish Society of Automation (SAS) and also the Society of Academic Technologists (KAL), Finland.

Professor Aumala has received many awards: the Golden Bullet of Finnish Society of Automation in 1999; corresponding member of the Saxon Academy of Sciences in Leipzig in 1999; Knight, First Class, of the Order of the White Rose of Finland in 1999; IMEKO Distinguished Service Award in 2000; honorary member of Finnish Society of Automation in 2001; honorary member of the Advisory Board of IMEKO in 2003.

During his career he has been one of the team developing electronic motor drives, power electronic lightning systems for theatre stages, a prototype of electronic protective relays for high voltage networks, electronic measurement transmitters for process automation, etc.

Activities of Aimo Pusa in IMEKO



- IMEKO Committee, Member, 1982–1993
- IMEKO TC-3, Technical Committee for Mass, Force and Torque, as Finnish delegate and Technical Secretary since 1978
- General Council of IMEKO, Finnish delegate since 1990
- XIV IMEKO World Congress, Chairman of National Organising Committee, Member of IPC, 1995–1997
- IMEKO Technical Board, Member since 2001

Aimo Pusa was born in 1944. He received his B.Sc. degree in Electrical Engineering in 1966.

Aimo Pusa worked for BBC, Baden, CH, as Testing Engineer of High Voltage Switches 1967–1969. At Axel v. Knorringin tekn. Toimisto, Helsinki, FIN, he was Head of the Group of Measurement Technology and Sales Engineer for Measurement of Mechanical Quantities 1969–1973. After that he worked for Innotec Oy, Espoo, FIN, as Project Manager, R&D, Analysing Technology, 1973–1975. At Lahden Rautateollisuus Oy, Lahden Vaaka*), Lahti, FIN, he was R&D Engineer of Weighing Technology 1975–1981. He then worked for Eletroniikkayhtymä Oy, Nummela, FIN, as Sales Engineer and R&D Engineer of Weighing Technology 1981–1983. At Raute Precision Oy*), Lahti, FIN, Pusa worked as R&D Manager of Weighing Technology 1983–1989 and Reacher Manager 1989–1991. At Raute Precision Oy*), from 2004 Lahti Precision Oy, he was Head of the Force and Mass Laboratory, Measurement Technology of Mass Quantities 1991–2008. At present Aimo Pusa is retired, working as a metrology expert on a private basis.

Aimo Pusa has been a member of the CCM Force Expert Group 1993–2008; Delegate of Finland for the EUROMET Mass Group 1991–2008; Delegate of Finland for the EA-Expert Group Mass, for Force, Torque, and Hardness; Chairman of the National Advisory Committee for Metrology in Finland 1998–2007, and a member of this committee since 1978; a member of the Education-planning Group for Metrology by AEL (Centre for Technical Training in Finland) since 2000.

Aimo Pusa had responsibility – among others – for these projects: construction of a new force laboratory by Raute Precision Oy, 1984–1986; a pilot laboratory for national key comparison in Force 5 kN and 10 kN, 1998–2005; development of the torque measurement facilities with reference transducers up to 20 kN m, 1996–2004. He has been a key specialist for measurement in the car inspection for roll brake testers for projects of the "The Finnish Vehicle Administration AKE" in years 2000–2005.

Pusa has specific experience in the following spheres, as well: In Finland, Technical Assessor for force; Slovenia: Technical Assessor for force, torque, hardness measurement, testing of weighing instruments for legal metrology and car inspection, 2003–2008; Sweden: Technical Assessor for force, torque, hardness measurement, and testing of weighing instruments for legal metrology, 2005–2008.

He has tens on publications about the area of mass and force and torque, etc. His papers have been published for decades at international conferences and events. He has over 200 presentations for Finnish organisations and companies (AEL, MIKES, IIR, INSKO, etc.) on the topics of general metrology, calibration, quality system in measurement, measurement of weighing technology, force, torque and mass.

Activities of Jouko Halttunen in IMEKO

- IMEKO Committee, Secretary, 1989
- IMEKO Committee, Member, 1987–1993
- IMEKO CD Symposium 97, NOC, Member
- IMEKO TC-4, Member
- XIV IMEKO World Congress: Member of National Organising Committee (NOC), Vice Chairman of International Programme Committee, Editor, 1995–1997
- IMEKO Virtual Workshop on Tools for Education in Measurement, LOC and Editor, 2001
- IMEKO On-Line Virtual Workshop on Tools for Education in Measurement, LOC and Editor, 2002
- IMEKO General Council, Finnish delegate since 2004
- IMEKO Committee, Chairman since 2006

Professor Jouko Elias Halttunen was born in 1950. He took his matriculation examination in 1970 and received his M.Sc. degree (Diploma Engineer in Electrical Engineering) at the University of Oulu in 1975, Lic. Tech. at the Tampere University of Technology (TUT) in 1984 and Ph.D. degree (Doctor of Technology) at TUT in 1992.

Jouko Halttunen worked for the University of Oulu as Acting Assistant 1975–1976, Trade School Teacher in Kajaani, Finland, 1977–1978. 1978–1983 he was Assistant and Acting Laboratory Engineer in Measurement Technology at TUT and Acting Senior Assistant of Measurement Technology 1983–1984. 1989–1990 Halttunen lived in Gaithersburg, USA, where he worked as Guest Researcher at NIST. After that he moved back to Tampere and worked for TUT as Senior Assistant in Measurement Technology 1984–1994, Acting Associated Professor 1994–1995, Associate Professor 1995–1998 and Professor since 1998. He was Head of the Institute of Measurement and Information Technology 12/1999–12/2007 and has been Head of the Department of Automation Science and Engineering since January 2008.

His specialities have been Sensor Technology, Metrology, Flow Sensors and Flow Measurement methods, Temperature Measurement Methods and Electrical Measurement Methods.

Professor Halttunen has lectured courses in Electrical Measurement Methods, Sensors and Transducers, Advanced Topics in Sensor Technology, Metrology and Sensor Physics.

Jouko Halttunen has been Referee in scientific journals: IEEE Transactions on Instrumentation and Measurement, Flow Measurement and instrumentation, Measurement; Referee for Academy of Finland; Referee for EU; Referee for Estonian Science Foundation; Part-time Consultant for Centre of Metrology and Accreditation (MIKES), Flow contact person EUROMET, EA, BIPM-WGFF, 1998-2004; Technical Assessor for FINAS (Finnish Accreditation Service).

He has been a member of Advisory Committee for Metrology (Finland) since 2001, Expert Group: Flow Quantities member (Vice Chairman 1992–2000, Chairman 2001–2004 Vice Chairman since 2005); a member of the Finnish Environment Institute, Expert Group: Standardization of Hydrological Measurements.

He has about 100 national and international publications in different areas of measurements and sensor technology.

Activities of Paavo Tuomi in IMEKO

- IMEKO Committee, Member 1991–1993
- IMEKO General Council, Member since 1993
- XIV IMEKO World Congress, National Organising Committee, Member 1995–1997
- IMEKO Technical Board, Member 1997–2000

Paavo Olavi Tuomi received his B.Sc. degree (Engineering) in 1952.

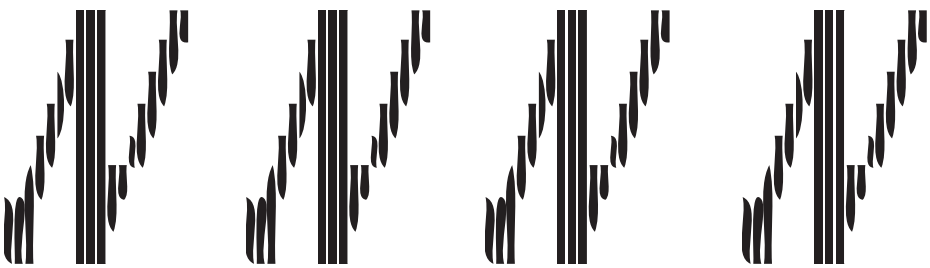
He worked for the University of Helsinki as Technical Assistant of Department of Physics 1949–1952 and Planning Engineer 1952–1960. At Suomen Kaapelitehdas Oy, Department of Electronics, he was Service Manager of computer systems 1960–1962, Production and Planning Manager 1962–1965, and Head of department of military electronics 1965–1967. 1967–1975 he worked for Oy Nokia Ab Elektroniikka as head of department of special electronics, 1975–1982 as director of department of industrial automation and 1982–1983 as Technical Director of Oy Nokia Ab Elektroniikka. At Oy Kajaani Elektroniikka Paavo Tuomi was Managing Director 1983–1989, and at Oy Valmet Automation, Vice President of strategies and structures 1989–1991.

Paavo Tuomi has done Equipment Planning for nuclear research in 1954, 1955 and 1958 at Nobel Institut för Fysik in Stockholm, Sweden, at Institut för Teoretisk Fysik in Copenhagen, Denmark, and at Cambridge University, Cavendish Laboratory in Great Britain.

He has given lectures as part of the wider basic course about the electronics and research equipment for nuclear Physics at University of Helsinki, Department of Physics, 1955–1959.

Towards Turin

In spring we left for a world congress in Turin to market the event in Tampere with Jouko Halttunen, Heikki Jokinen, Paavo Tuomi, Maarit Mikkola and Pirjo Venäläinen, as well as a quantity of marketing material, for instance partitions. At Helsinki-Vantaa airport, because of the amount of luggage we had, we decided to change our travel plans by renting a car from Milano airport. The car was waiting for us at the airport but turned out to be too small for all of us. Paavo therefore gathered up his belongings and took the train. The map from the car rental agency was of no help as we could not find our way from the ring road to Turin. The only way was to open the window and ask the ”neighbour”: Turin? He signed to us and accelerated, us behind, and so we found the right exit. Our driver drove as fast as she could, as the others sat there pale and silent.



Fire service on the balcony

We were holding a meeting, seated and having a picnic on our roof terrace on the eighth floor. The voices of the city were drowned out by the general uproar of the city. Suddenly we froze, noticing a man's head rising from behind the balustrade. Finally ladders came into sight and a man wearing a fireman's suit was peering at us with as much surprise as we looked at him. Not understanding the language he used, we had no idea of what he was saying. He started descending. Later we heard that one man downstairs had had some kind of an attack and the fire service had been called to enter, not breaking the door.

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Memories of Aimo Pusa

Force -85 Seminar in Rovaniemi, Finland 22–24 September 1985

My participation in the activities of IMEKO started about 1977 or 1978. I am unable to find the exact date because no documents are available.

The next documented way station was the year 1983. TC-3 congress was held then in London. There I got to know more experts in force measurement. Earlier I had already met Mr. Peters from PTB. Well-known names in the force measurement field in Europe were Wieringa and Mast from the Netherlands, Jenkins from the UK, Gosset from France and Bray from Italy.

At the same time plans started at Raute Punnitus and Automation Company to begin in-house manufacturing of detectors and to build the necessary laboratory for this. Behind this idea was the Managing Director of Raute Ltd at that time, Heikki Mustakallio.

When the construction of the laboratory was started at the end of 1984, I began to make my plans for getting the force seminar to Finland. Especially Mr. Peters was eagerly for the event, and got other experts interested in Finland's forest glowing with autumn tints. So, let's build the programme!

Thinking afterwards and perhaps with a little more experience, I have to wonder how we were able to arrange the seminar and got quite a reasonable number of participants. Also the content of the seminar lectures shaped up to be interesting, and obviously for the first time in Finland the measurement of force was treated so widely. Six of the lecturers were international and four were from Finland. The venue was hotel-restaurant Pohjanhovi in Rovaniemi, the exoticness of which was of course one reason for taking part in the congress. As always at all good seminars, the best conversations and building of contacts took place out of the lecture hall.

Even though measurement of the force was of course done earlier in our country, too, and VTT had nationally responsibility for tracing of force, this event was the starting point which has led to what is now active development of measuring force and torque in Finland.

TC3 meeting in Kairo in 2005.

TC-3 Congress in Finland, 1993

When I started to participate in the activities of IMEKO and we had completed the force measurement laboratory of Raute Precision in 1986, our aim was to bring the TC-3 conference to Finland. It went so indeed, and the event was held in May 1993. The beginning of the month was very warm, but the participants had prepared for the cold climate of Finland. However, for example during a visit to Lahti, the temperature was almost 25°C and the participants got to enjoy the heat of the sun in Mukkula park. The conference was held at the Exhibition Centre in Helsinki. The number of participants was a little over 100. As additional programme the guests were able to listen to music on Upinniemi, at the naval officer club, and this seems to have been stayed in memory quite impressively. Not very long ago, many of the participants mentioned their memories and experiences in Finland. During the conference I was given the duties of TC3's technical secretary, which I carried out until 2007, when a similar conference was held in Mexico.

In the publication of the conference there was the peculiarity that some presentations based on not too scientific facts have been appended to it: "Application of Scales of Measurement to the Measurement of Ladies" by Olli Aumala, and "Some Unusual Units Which I Have Encountered" by Peter Stein, which gave, for example a definition of a "unit of beauty". These addenda are obviously the only examples of this kind in the history of IMEKO publications.

World Congress 1997, etc.

Immediately after the World Congress in China, a meeting of the IMEKO council took place in Tampere, at which I was awarded the chairmanship of the World Congress in 1997. So, afterwards it is good to find that – fortunately – I did not understand the entire expanse of the task. However, the composition of the team and the skills of its members were most important. On behalf of ATU (Suomen Automaation Tuki Oy = Finnish Automation Support Ltd) the practical organisation was led by Mrs. Pirjo Venäläinen. Her talent of grasping matters from the right perspective was very important for the success of the process. ATU succeeded in getting capable people to work for the organisation, and this was also a good basis.

Now that the time since the congress is already over ten years, and I try to crystallise the issues which had the most important influence on the congress, I find the most powerful was our focus on getting participants to the congress so efficiently. We sent over 4,000 letters of invitation to the addresses we had, and judging by the number of participants this work seems to have succeeded. Another clear choice was during the congress, where our aim was to take care of the participants. We did not leave them alone with any problems they might have. This meant of course some more staff, but because our personnel were willing and able to serve, helping also went smoothly. A lunch table of their own was reserved for the chairmen of the sessions, which drew much praise. Could the reason have been purely culinary?

Social events are always the best part of congresses. I dare to claim that especially in Tampere this side served participants very well, at least if we believe the latest feedback. During the week, of course, a lot of various matters were dealt with, and all indeed progressed excellently for the most part. But some uncontrolled situations occurred. Some of them have especially stuck in my mind. A ”get-together” took place in Näsinneula tower. This is very exotic with its excellent views, and the weather was good too, with an almost cloudless sky. The only problem were the lifts, which did not have a very large capacity for transporting 700 visitors up and then down. It had been announced that the closing time for the event was at 11 p.m. As it came closer, Pirjo wondered why people weren't moving to the lifts. Then I understood that most of the visitors were from the south and obviously expected darkness to fall by 11 p.m. Outdoors it was of course still light in Finland, because it was the beginning of June.

Another event happened at the closing ceremony, in which I had to ask Professor Izuka from Osaka to make the invitation to the next congress. However the request turned in my mouth to ”Professor Osaka from Izuka”, which Professor Izuka didn't take unkindly. Always when we meet he remembers me well, perhaps just because of this. So I believe, so warm has his welcome always been.

Now after several world congresses I can state that in every country congresses have features of their own and people receive pleasant memories. As one of the authors it is difficult to rate our own congress on the same scale. Also, memories naturally focus on different things, but on the top of my own images are the satisfied congress participants who came to say goodbye after the event.

Aimo Pusa with colleagues in Näsinneula.

Prof Peters and Prof Ono having pleasant conversation.

Prof Pfeifer wished all the best to Prof Maeda for the XV World Congress in Osaka, Japan. Left at the table Prof Ferrero and his friends.

Some memories and feelings of Olli Aumala

The first IMEKO trip to Budapest took place in April 1975. Spring would be at its most beautiful phase. Expectations were high, but surprisingly Hungary got 20 cm of snow! The cold weather was however contrasted by the warm welcome of the IMEKO people. The Secretary General, Dr Striker, and the Secretariat, Mrs Szolti, welcomed the new Finnish delegate very warmly indeed. A special table was arranged for the observer, who had more space available than any of the members of the General Council.

During the meeting I handed over a small gift from Finland: a wooden sauna thermometer. In my address I noted that the purpose of this meter was "to measure the heat of the activities in the Secretariat". The address was received with cheerful applause. I felt that the Finnish application was given already a secret approval.

The trip to Beijing in 1991 was personally painful. During the long flight I suffered stinging pains in my right leg. The meetings, however, went normally, and the result was of course very stimulating. Afterwards I told about my pains to a friend doctor at home and asked what to do. He asked me how I felt now. After hearing that the pains had gone he replied: because you are still living, nothing should be done. I learned that the pains came from a deep thrombosis. If it had got loose it could have gone to my lungs and possibly killed me.

After the Beijing Congress in 1991, I collected a group of Finnish colleagues. I was very lucky to have recently retired high-level strategist Paavo Tuomi in that group. We analysed the situation, drafted how to finance the Finnish operations, and started a development project for an IMEKO Expertise database. When the software was ready and tested it was given to the IMEKO Secretariat. To my disappointment I realized now that the Secretariat was not using computers enough; the software was distributed to some key persons and used "as is" but not updated or developed. It was a good innovation but too early. I also tried to arrange a special meeting of TC Chairmen for launching a common strategy project, but this attempt was not successful. I could only see that scientists who work voluntary for IMEKO did not prioritize this work enough.

In Turin in 1994 my task as the President started. During the delicious faraway dinner of the officers I had to make a short speech thanking our host. To my astonishment, I had no information about who our host was. So I presented a warm thank to the host who possibly had wished to remain unknown. General amusement followed, and we were able leave the dinner with a good mood.

At the Turin Congress in 1994 we had a presentation for the upcoming Tampere Congress. In addition to the printed material and bonbons there was also a demonstration of the newly constructed expert database for seeking and contacting IMEKO fellows. There was very keen interest to try this database, but of course no user's guide was observed. The software was started again and again even when already running, and it stuck often. Exiting and restarting was needed, nothing more, but even this was not easy. The computers had an Italian Windows system, and commands had to be guessed.

After the Tampere Congress in 1997

The Tampere Congress was successful: more participants than ever (roughly 50% more than at the preceding Turin Congress), particularly more young scientists and engineers. The new website seemed to have a striking effect on this.

The smooth organizing was praised as well as the venue: there was a good Congress Hall, Tampere was small enough, and most distances were suitable for walking!

The personal touch of organizers was apparent. At the Opening Ceremony we had a special "multimedia" presentation: A Wind Orchestra presented a potpourri of anthems of all the IMEKO Congress countries (arranged specially for this event), and simultaneously, in synchronism with the music, a projected IMEKO Emblem was decorated with corresponding flags. Finally a flower of flags appeared. Some delegates told me later that they felt a shiver down their back when their own anthem was heard.

Reception atmosphere in the Town Hall. From left Jouko Halttunen, Pirjo Venäläinen, Eeva Aumala, Meeri Halttunen, Olli Aumala, and Vladimir Sobolev.

The barbecue evening on Viikinsaari Island was noted for its ”kyykkä” game, sauna, and particularly the presentations of the girls' circus show and violin music, both presented by children of the members of the Organizing Committee. Also the evening of culture and fine arts in the Cathedral was unique. The art (paintings and frescos) of the church was presented together with suitable organ pieces played by Matti Hannula (well, the evening was started with an organ solo composed and played by myself). Afterwards the British delegate Ludvik Finkelstein told me that IMEKO was now blessed for the first time in its history.

After the Vienna Congress in 2000

My feelings had got remarkable impulses. I had been decorated with a Distinguished Service Award, and President Iizuka had read a long list of my achievements. Was all this true? Who had made these achievements? Was this worthwhile?

When nine years ago I was considering whether to apply for the Congress or not, I had collected the following facts:

- There was lot of work to be done. I did not have all necessary skills. And I could not handle all the work without a good and devoted team. I was very lucky to have these devoted colleagues, a highly professional national Secretariat included.
- Equally important was that I had a vision of how to develop IMEKO. All aspects could not be realized, but the more important ones were. Together with the other team members we could develop the vision further.

My hesitation vanished. Afterwards I can be very satisfied:

- Our team worked seamlessly. Its achievement was admirable. Thus the award was really earned.
- There was also one bitter lesson. When trying to clarify the IMEKO strategy I tried to arrange a particular meeting for all Technical Committee chairmen. This did not succeed. I realized that experts and leaders working voluntarily would not do anything just because someone suggests it. I concluded that the strategy could be worked out only by giving the leading persons motivation, not by commanding them.

I would state now that the honour of the leading position is far too little compared to the work to be done. When I consider the experience of working with so many leading scientists, the result of the work for IMEKO, and other aspects, this however balances by far the hard work. I feel thankful and satisfied indeed. I hope that the forthcoming officers of IMEKO can share this conclusion.

Evaluation process

We received almost one thousand abstracts. To copy, rivet, bundle and send them, we hired a class of elementary school pupils. Supervision of the work had great importance as the papers had to reach the right persons. To sort that amount of paper, a lot of space was needed. The work was paid with hamburgers. The pupils' sometimes short-sighted and impatient way of working had to be taken into account when assigning tasks. The manual work went well and the number of mistakes was minimal.

Funding from the Academy of Finland for participants from CIS countries

The Academy of Finland allocated travel and accommodation compensation worth 75,000 marks for participants coming from CIS countries. Compensation was paid in cash. Furthermore, we had informed everyone that for people from certain countries we would refund a certain amount of travel costs against a receipt. The money was withdrawn in cash. Beforehand we checked that there were enough coins to give small change as the travellers did not have it. To carry the money to the car, we were given a guard. In the beginning of the congress the cash desk was piled up because we were checking receipts written in Russian and giving money to the penniless participants.

Number of personnel

50 persons were hired as personnel for the congress. The biggest group was assistants, who were from the institute of Päivölä. They were all given a uniform and training for the congress. During the congress I popped into one auditorium and noticed that the lecturer was speaking a language strange to me. I signed to the assistant and, slightly annoyed, asked if the chairman did not make sure that all everyone spoke English. The assistant smiled to me and stated that it was indeed English. At the beginning of question time, a young man in the audience stood up and said he would translate the questions.

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New Measurements – Challenges and Visions Technical programme

The technical programme was composed of four different events: XIV IMEKO World Congress, 2nd International Workshop on ADC Modelling and Testing, ISMCR'97 Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces and International CD Symposium '97. Cross Directional Web Measurements, Controls and Actuator Systems in Paper Machines.

For the entire event, more than 720 abstracts were submitted for review. All the papers were reviewed by at least two experts. Finally 550 papers, oral or poster presentations were accepted for inclusion in the programme. Only a few papers were not presented.

The programme was supplemented each morning before regular sessions by the papers of the eminent invited plenary speakers: R. Isermann, Germany, "Supervision, Fault Detection and Diagnosis – Advanced Methods and Applications", J. Kuusi, Finland, "Technology Gallop – Increasing Challenges for Measurement", Chr. Rohrbach, Germany, "Man as an Extreme Sensitive Sensor for Almost All Kinds of Radiation" and B. Athané, France, "Present and Future Trends in International Legal Metrology Cooperation".

At the end of the technical programme, before the closing ceremony there was a Visionary panel chaired by Professor P. Uronen. The panel consisted of representatives of the technical committees of IMEKO.

The scientific programme was arranged daily in six or seven parallel sessions.

The congress proceedings consisted of 10 printed volumes and a CD-ROM. A CD-ROM version of the proceedings was available for the first time in the history of IMEKO. This was the beginning for electronic proceedings, and now most of the proceedings are electronic, mostly in PDF format which is quite easy to prepare.

The organizers decided to prepare the CD-ROM in HTML format. During the time of the congress HTML editors were not well developed and freely available browsers were also not usual. For the purpose of reading the congress proceedings, the organizers obtained a license from Netscape Communications

Corporation to include a copy of Netscape Navigator for accessing the data on the IMEKO World Congress '97 CD-ROM. The paper submission was mainly in Word format using diskettes and even floppy disks, which included a lot of viruses. Quite a large number of papers were submitted only in hard copy. This caused a lot of work in scanning because this was the only way to convert the papers into an electronic form.

The conversion of the papers into HTML format was performed on a voluntary basis by a group of students and personnel at Tampere University of Technology. One student of technology, Heikki Saha, headed the CD work by using the HTML "Magic Editor", which had been developed by his company. Mass production of CDs was not yet very usual at the end of the nineties, so the organizers had to find a company which produced CDs at a reasonable price. Production took place in Germany.

The Internet started to become an important information channel for the congress, although ordinary mail was still the main information channel. Email was not as popular as today in information exchange.

The organizers tried to find a new method for poster presentations. It was decided that the posters were to be presented in a distributed way, which meant that there were no poster sessions in the traditional sense but the posters were on show during all the days of the congress. On the basis of this experience, the best way to present a poster is to present it to people who really are interested in the subject. During the congress there was a PC-based scheduling system available. The intention was for the system to be available to make contact between the lecturer and an interested audience. The aim was that the author would not attend the poster all the time but at agreed times. The organizers believed that this would be a much more fruitful way to present the posters, high-quality, highly specialised papers to be discussed with other specialists! The organizers' idea did not work as well as planned, but hopefully the idea was better than the traditional ways.

Jorma Punju and Jouko Halttunen discussing the arrangements.

Language skills

It was the last moments before drawing up the programme, when we stated that there were missing registration fees, which was contrary to rules and regulations. We tried till the end to get in touch with all those who had sent a paper and been accepted. We called all over the world. During a phone call to Nigeria, we heard roosters crow and cows moo in the background. No one knew anything about IMEKO. When I called someone in the Soviet Union and asked if somebody spoke English, the answer was ”only French”. Hanna Hinttala came to speak French, but after trying to be understood in French and all the languages she knew, she realised it was futile. So she blurted out angrily in Finnish: ”If we don’t have the money by tomorrow, your paper will not be included. There are no other options, whether you understand or not!” We never got the payment, but neither did the participant show up.

No-show papers

When it was time to decide which papers would probably be no-show, we worked hard in Tampere and Helsinki. At 3 a.m. it was natural just to call Jouko, who was still by his work table. Some nights, at a late stage, I would call to wake him up in the middle of the night if the work was not progressing as it should. Later we were highly commended for having one of the lowest numbers of no-show participants at an IMEKO congress. We had left out only one French person, who showed up in the congress with a pay receipt. To him we owned an apology, but the other 200 left out never showed up.

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Division of labour

The tasks were divided into areas of responsibility and everyone had his or her area. Young students were hired for these tasks. They responded for their tasks before the congress by working from time to time at the office. During the congress these responsibilities progressed easily. This was the division of labour:

- Supervision of work during the congress: Mari Hiltunen
- Proceedings: Marianna Lottonen and Mari Hiltunen
- CD-ROM: Tampereen opiskelijat - Students from Tampere
- Hotel reservations: Hanna Hinttala
- Transportation: Titta Rosvall
- Chairs: Kaisa Venäläinen
- Pre and post tours: Tampereen kongressitoimisto - Tampere Convention Bureau
- Technical tours: Tampereen opiskelijat - Students from Tampere
- Cashier: Hanna Hinttala
- Registration: Hanna Hinttala
- Exhibition: Students from Tampere University of Technology
- Press: Ilkka Porkka

We just had to have confidence in the young students and it was worth it.

Nowadays, some of those ”beginners” are working in similar international jobs, some of them worked with us time to time and one of them stayed with us for almost ten years before her graduation.

Additional programme

During the congress we offered the possibility for the participants to attend a lunch cruise, a Finnish Arts tour, and a trip to Helsinki and Espoo. On the pre and post tours the participants had a chance to travel to Lapland, Tallinn, and St. Petersburg, and attend a hiking excursion in the wilds.

Technical tours took the participants to companies in Tampere region, to Raute in Lahti, to VTT (the Technical Research Centre of Finland), Vaisala and Meteorological Institute. Yes, we used the word ”meteorological” instead of ”metrological”, which we noticed only in the beginning of the congress. Some of the participants cancelled the tour for that reason.

Technical Tours

Technical Tour 1

Nokia Mobile Phones Ltd. – Tampere University of Technology

Date	3 June 1997
Departure	08.30 Tampere Hall
08.30–09.30	Introduction to Nokia Mobile Phones
10.00–12.00	Introduction to Tampere University of Technology
Arrival	12.00–12.30 Tampere Hall

Technical Tour 5

Raute Precision Ltd. – Technical Research Centre of Finland

Date	6 June 1997
Departure	07.30 Tampere Hall
09.30–11.00	Introduction to Raute Precision Ltd.
13.00–13.30	Lunch will be served at VTT
13.30–16.00	Introduction to VTT
Arrival	Through the centre of Helsinki and Helsinki-Vantaa airport, after which the bus continues to Tampere Hall

Technical Tour 6

Vaisala Ltd. – Meteorological Institute

Date	6 June 1997
Departure	07.30 Tampere Hall
10.30–12.30	Introduction to Vaisala Ltd.
12.30–13.00	Lunch will be served at Vaisala Ltd.
13.30–16.00	Introduction to the Meteorological Institute
Arrival	Through the centre of Helsinki and Helsinki-Vantaa airport, after which the bus continues to Tampere Hall

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The technology gallop – Increasing challenges for measurement

Plenary presentation 3rd June 1997 in XIV IMEKO World Congress in Tampere Hall

PROF JUHANI KUUSI
Nokia Research Center, Helsinki

Abstract: At the stage of development and breakthrough of new technologies and their applications, the need for various types of measurements increases – often drastically. This is also true within the present explosion of mobile communications.

The issues connected with efficient use of the limited-frequency spectrum available, high operational demands of very complicated systems, potential interference with other equipment and systems, propagation and absorption of electromagnetic radiation, and the great need for wide international standardisation enhance the role of measurements throughout all development and operational stages and areas of mobile communications.

Measurement types such as System Design Measurements, Product Performance (approval) Measurements, Operational Measurements and EMF measurements are needed.

In this presentation, the characteristics of these measurement types are discussed and a couple of illustrative cases are described.
Keywords: telecommunications, mobile, measurements.

Introduction

In his opening presentation of the previous, XIII IMEKO World Congress in Turin in 1994, T.J. Quinn from Bureau International des Poids et Mesures, Sèvres, France, noted: In today's society there exists a vast, often invisible, infrastructure of services, supplies, transport and communication networks. Their existence is usually taken for granted, but their presence and smooth operation are essential for everyday life. Part of this hidden infrastructure is metrology, the science of measurement. This is very true for mobile communications technology, the development and utilisation of which have really escalated to a full gallop during recent years.

Users of mobile communications often focus their attention only on the handset, which itself is already a product incorporating super-complex engineering and manufacturing as well as sophisticated measurement work. Less attention is given to the exceedingly complicated network system that guarantees mobility. The design, construction and operation of the network system involves truly demanding feats, not to mention various measurement tasks. Because the area and the technology are further complicated by the very limited frequencies available, a great deal of attention must be focused on the purity of the frequency spectrum as well as interference and re-use issues.

This presentation aims to shed light on the various measurements needed in mobile communication technology's development, design and utilisation phases. Case examples are taken from System design, Product performance approval, Operational measurement, and EMF (Electro Magnetic Field) measurement. Even these few and briefly illustrated case examples demonstrate once again how important for the breakthrough of some area of technology is the quality of its supporting, varied, and often new measurements, as well as the appropriate possibilities of conducting them.

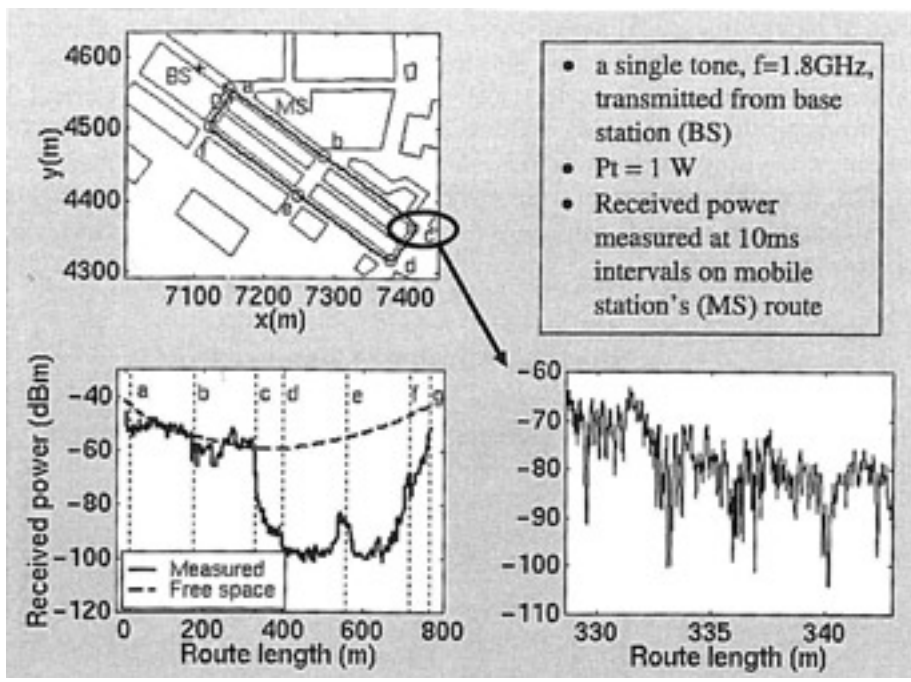


Figure 1: Left: local mean received power curve, averaging interval 3 m. Note the corner attenuation of nearly 40 dB. Right: small scale variations caused by movement <- phase shifts of the multipath propagation components are changing continuously, producing small scale fading with consecutive minimums in the wavelength's scale.

Product performance measurements

A product like a mobile handset has to go through a multitude of product performance and approval measurements. A complicated measurement and testing procedure is an essential stage of the whole manufacturing process.

EMC (Electro-Magnetic Compatibility) measurement serves as an example of a group of demanding product performance and approval measurements.

There are three motivating factors for EMC considerations: the internal functionality of mobile phones, emissions-interfering electronic equipment, and international EMC regulations. Mobile phone internal blocks, like RF and baseband, have to be separated in order to avoid malfunctions. And, if EMC shielding is not satisfactorily completed, it is possible that mobile phones can unintentionally interfere with other electronic equipment or other equipment can interfere with mobile phones. Lastly, international regulation has become more stringent in the past few years; for instance, the new European EMC Directive (EN55022) became effective in January 1996. There are also several other EMC standards, like ETSI (GSM), ITU, CISPR22, FCC, and CEPT standards.

Typical EMC measurements can be divided into three categories: radiated emission measurements, radiated immunity measurements, and conducted interference measurements. In all these measurements standards regulate emission levels, measurement systems, and measurement equipment.

In the following radiated spurious emission measurements are used as an example of EMC measurements. A Shielded Anechoic Chamber (SAC) is commonly used in this.

With the stricter regulations and the dropping profit margins of mobile phones, special attention must be focused on EMC in the design phase. Through clever design, EMC shielding problems can be greatly reduced.

Operational measurements

A special feature of a mobile telecommunications system is that its functioning requires a very great quantity of continuous measurements and actions based on the results of these measurements.

In a mobile communication system, the radio environment constantly changes as the mobile stations move around. Moreover, new calls are set up and old ones are released, which may affect interference levels in other parts of the network. Calls need to be handed over from one base station to the next according to the mobile station's movements. It is also advantageous to keep the transmission power of mobile stations and base stations as low as possible. All this

indicates that measurements concerning the radio environment must be carried out constantly.

A typical quantity measured is the signal strength. This may be the signal strength of the connection to the base station, a beacon signal from a base station, or the interference level on a free channel to be allocated for a call. During a call, the signal quality can be measured, for example, based on the bit error rate. The propagation delay is often measured to adjust the timing and to estimate the distance to the mobile station from the base station.

In addition to the measurements concerning the radio interface, a lot of information is collected in various network elements. Such information includes the traffic load, charging information, call and handover statistics, alarms, etc.

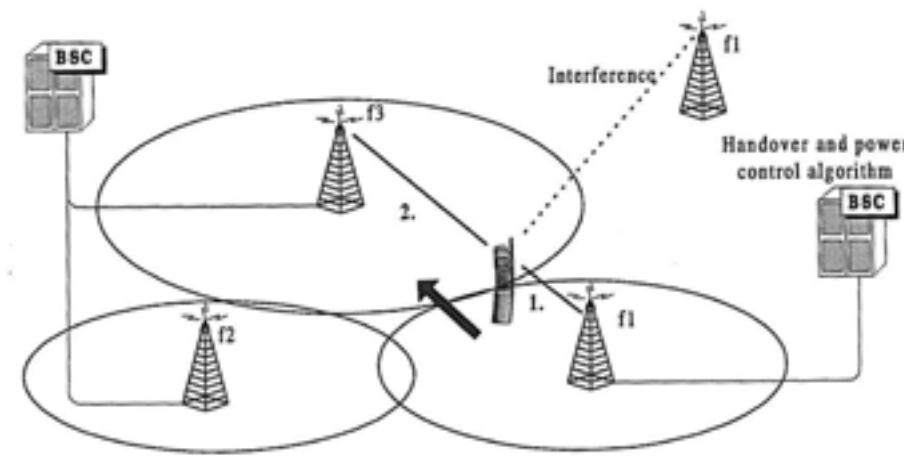


Figure 3 : During the call, the mobile station continuously measures the signal level and quality of its radio connection. When certain criteria are met, e.g., the signal from the neighbouring base station (f3) has been strongest, for a certain period of time, the base station controller (BSC) hands the connection over to this station.

EMF measurements

Normally in radio communications antennas are placed on a mast or roof, far from interfering objects. In the case of mobile phones, however, the situation is substantially different: the phone may be in a pocket, on a belt, on the ear, in a bag, or on a table, and it then can lose 20–30dB of its gain towards the base stations. Usually reflections from nearby buildings and walls help the situation and no calls are missed, but in rural areas this can be a major problem.

In this respect, the shape of the field of electromagnetic radiation from the antenna is of utmost importance.

The normal use of cellular phones is such that they are near the head or body when calling. Therefore, the body influences the performance of the antenna in three ways: First, by changing the antenna impedance or retuning the antenna so the antenna will not radiate its entire power from the transmitter. Depending on the hand position when holding the phone, the antenna impedance changes. Second, when the body is near the antenna, it is in the so-called near field of the antenna, which means that a certain part of the power from the transmitter is absorbed by the body and hand depending on the shape of the emitted electromagnetic radiation field. Third, the human body shadows the antenna. This means that the antenna must be designed so that the matching and the radiation patterns with the human head and hand is desired. To attain this measurement, phantom models of a human head and hand are used. Another big challenge is to increase the antenna efficiency and optimise the radiation pattern, to increase the battery usage hours or minimise its size.

The measurements carried out most frequently in this connection are:
- impedance measurements with different head and hand positions using phantoms
- radiation patterns measurements with and without phantoms in an anechoic chamber
- gain measurement in an anechoic chamber using reference antennas
- field tests with real base stations on a well-defined route
- efficiency measurements (3D-radiation patterns and total radiated power measurements in stirred mode-like chamber)

A basic measurement arrangements as illustrated in Figure 2 are frequently used even if instrumentation and measurement geometrics are typically much more complicated.

Future challenges

Development towards 3rd generation mobile communication systems with multimedia and highly increasing bit rates together with increasing subscriber numbers will certainly keep this sector as the most demanding and interesting also in respect of measurement technology.

Memorandum

The Visionary Panel of XIV IMEKO World Congress produced wide views on the operations and the near future of the technical activities of IMEKO. It also presented proposals for new tasks which will be briefly restated here for information and activities of the relevant bodies of IMEKO.

Proposals of general interest

- To IMEKO TB: IMEKO should run a Delphi-type project (jointly with all TCs) to determine the 100 key measurement problems or trends. This project could be reported during the next IMEKO World Congress.
- To have more joint Conferences (Dr Peters mentioned TC3, TC16 and TC5).
- Should the scope of measurement engineers be broadened?
- IMEKO has to be developed as a global network between experts for information and co-operation.
- The chairmen of TCs should encourage younger scientists to present their papers.

Detailed proposals

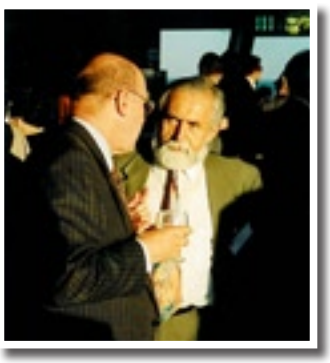
- There is a need for better checks on the originality of papers.
- The fees for Conferences should be reconsidered and possibly lowered.
- Training and education will be done using more and more virtual instruments and virtual laboratories (Internet, computers, etc.).
- The quality of electrical power supply has to be defined. EMC etc. are important because there is a need to guarantee the operation of measuring systems and other information systems.
- Hardness will be worked as a component of product quality and as a quantity which has relations with many others.
- Quality assessment and quality management are important topics (also) in the future.
- Preparations have been started for establishing new Technical Committees, for example, for environmental measurements and for measurements of human functions.
- There were several detailed reports n activities of Technical Committees and their topics of importance.

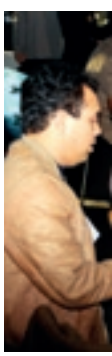
These notes were taken from a video recording by Olli Aumala.

Visionary panel Chairman, professor Paavo Uronen.

Get-together

The get-together was arranged in Näsinneula Tower at Särkänniemi amusement park. We were served little patties, salad and cups of berries with white and red wine, beer and mineral water. We had a welcoming toast inside the Dolphinarium to get people up to the tower little by little and not all together. We tried to guide the participants to the lift without queuing. Luckily the lift went smoothly up and down. The views were magnificent, which helped to stimulate small talk.





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PR work and desktop publishing for the XIV IMEKO World Congress

Mrs. Pirjo Venäläinen from Suomen Automaation Tuki Oy (The Finnish Support of Automation Ltd, ATU) asked me to take responsibility for writing press releases, publishing daily newsletters and taking photos before, during and after the event. A bit of self confidence, no self-criticism and some experience in producing press material and using desktop publishing tools, a digital camera, a PC and e-mail were the skills for making decision to take the job.

We made the first press release based on the programme of the World Congress, plenary speakers, the number of presentations and participants, and programmes of parallel workshops and symposia. Of course, links on the Internet to the IMEKO website, IMEKO XIV contents page, etc., were given to journalists and other visitors for additional information about the presentations.

The first press release was published on 26 March 1997. It was sent to the trade and business press and many radio and TV companies and freelancer journalists, as well: Automaatioväylä (Automation Fieldbus Magazine), Kauppalehti (business newspaper), Metallitekniikka (trade magazine for metal technology), MTV (a commercial TV channel), Paperi & Puu (Paper and tree magazine), Prosessori (processor magazine), Sähkö & Tele (magazine of electricity & telecommunication), Sähkömaailma (electrical world magazine), Amppeeri (magazine of electrical etc. technology), Koneviesti (newspaper about machinery and technology), Startel (news agency), STT (news agency), Tekniikka & Talous (technology and economy, weekly tabloid), YLE Radio and TV News (national radio and TV channels), YLE Tampereen Radio (local radio channel in Tampere), and Tiede 2000 (science 2000 magazine) etc..

Automaatioväylä produced a special issue about the World Congress in English. It was published before the event together with a normal journal.

Daily newsletters using e-mail and Copy Shop

During the XIV IMEKO World Congress I had to publish every day a 2-page newsletter: IMEKO Congress News. The first issue was published on 2 June in

IMEKO Congress News

The Final Report of the Organiser

Mr. Aimo Pusa, Chairman of the Organising Committee, gave the Report of the Organiser during the Closing Session of the XIV IMEKO World Congress in Tampere Hall on 5 June 1997.

Aimo Pusa, Chairman of the National Organising Committee.

conditions have been acceptable and ordered in a

that on behalf of the congress hall they had 15 persons. I have to point out my best thanks to them, lecture room assistants and technical personal.

The congress secretariat headed by Pirjo Venäläinen has operated continuously without rest from morning to late evening. Warmly thanks to them.

Editing and revising the text by 3800 pages was done by a group of students and young scientists conducted by Jouko Halttunen. To all of them I would like to express my sincere thanks.

International Programming Committee has also done remarkable job for the success of the congress by reviewing all papers.

Last but not least I would like to express my humble thanks to all of you - the participants of the congress - who made this congress successful scientifically and technically.

I have also felt the good spirit on being together.

Ladies and Gentlemen, I have a vision that this might be a fruitful starting point for the organising work of Osaka congress.

IMEKO Congress News

Volume 1, Issue 5 *09 December 1997*

Participants of XIV IMEKO World Congress

Australia	4
Austria	12
Belgium	9
Brazil	7
Canada	12
Chile	1
China	5
Croatia	8
Czech Republic	26
Denmark	5
Egypt	3
Estonia	5
Finland	183
France	28
Georgia	1
Germany	71
Hungary	6
Iceland	1
India	1
Ireland	2
Italy	82
Japan	99
Kenya	2
Korea Republic	12
Lithuania	7
Macedonia	2
Malaysia	2
Mexico	3
Netherlands	7
Norway	5
Poland	56
Portugal	7
Republic of Korea	2
Romania	7
Russia	34
Singapore	1
Slovakia	6
Slovenia	14
South Africa	1
Spain	11
Sweden	35
Switzerland	4
Turkey	11
Ukraine	20
United Kingdom	22
USA	23
Yugoslavia	3

Conclusions, awards and new officers

Visionary panel made conclusions of the congress. It was held on Thursday 5th June just before Closing Ceremony. During the Closing Session were given the Report of Organiser, Distinguished Service Awards and György Striker Award, and published the names of new officers.

The flags of 47 nations were flutterin in front of Tampere Hall.

Visionary panel consisted of members of technical committees, which had done their conclusions for the future.

TC1: D. Hofmann
TC3: M. Peters
TC4: M. Savino
TC5: G. Barbato
TC7: L. van Biesen
TC8: S. D'Emilio
TC10: I. Hanheide
TC11: E. Seiler
TC14: Sh. Ozono
TC15: A. Freddi
TC16: N.D. Samaan
TC17: S. Tachi

All others were Chairmen of TC except M. Savino (TC4) and I. Hanheide (TC10).

Here are a few opinions concerning the World Congress:

- My own view was that IMEKO will develop its nature as a global network connecting scientists and engineers, said Prof. Olli Aumala.

Paavo Uronen (chairman of the IPC) suggested that IMEKO should set up a task force for continuing visioning by the well-known Delphi method.

Service Awards

IMEKO Distinguished Service Awards holders this year:

- Prof. A. Bray (Italy) Co-Chairman of Turin Congress, Italian GC delegate, Honorary Member of TC3 and organiser of a TC Conference in Udine 1974
- W. A. Bajek (USA), GC delegate and AB member.
- Prof. E. R. Carson (UK), Chairman of TC13 for many years
- Prof. I. Morishita (Japan), GC delegate, AB and TB member
- Prof. S. Tachi (Japan), Chairman of TC17
- Prof. G. Zingales (Italy), GC delegate, President 1991-1994, Chairman of the AB, Co-Chairman of Turin Congress.

New Officers

New IMEKO Officers are:

- President Dr. K. Iizuka
- Past President Prof. O. Aumala
- President Elect Dr. M. Peters
- Secretary General Dr. T. Kemeny
- Treasurer Prof. P. H. Osanna
- Vice President for organising IMEKO XVI Prof. W. Wehrmann
- Vice President for organising IMEKO XVII Dr. M. Borsic.

***XIV IMEKO World Congress Proceedings are for sale** in XIV IMEKO World Congress Secretariat. CD-ROM costs FIM 300 and volumes FIM 90 / each. Mailing costs will be*

1

Ilkka Porkka was editor of Congress News for XIV IMEKO World Congress in Tampere-talo. You can find all newsletters on the pages 85–94.

1997 and the 4th on 5 June. After the congress we published one more newsletter on 9 December 2007.

I had just some months ago founded a company of my own – Porcat = Porkka Communication and Translation – and had a brand new PC with a 133 MHz processor! For desktop publishing I had Microsoft Publisher 97 and for e-mailing a phone modem of 56 kBaud/s. My old film camera was also in use, but for newsletters and Internet page publishing I used a digital camera belonging to ATU.

You can find all the newsletters on our site. The content for the newsletters came from changes and corrections to the programme, cancellations of presentations and chairmen, pictures from ceremonies, events and lectures, some national and local news, introduction of the exhibitors in Tampere Hall during the event, the final press release, conclusions, awards and new officers and the final report of the organisers.

Every morning after finishing the layout of the newsletter, I sent it by e-mail to Tampere Copy Shop. In less than an hour they had printed 800 copies of the newsletter. I drove the Copy Shop's office, picked up the completed newsletters and brought them to Tampere Hall for distribution to the participants of the Congress.

Afterwards I have to say, that there was no time and personnel for proofreading the texts of the newsletters. That is why you can find many mistakes and misspellings on the pages, because we republish them as original form. On the other hand this kind of on-demand newsletter publishing, e-mailing the originals to the Copy Shop and printing them very quickly and distributing them to the people was the first case of its kind the history of Tampere Hall.

Exhibitors on the Internet

I was familiar with making websites because I had created the 50 first pages for Siemens Finland, starting in 1994. During the XIV World Congress I just took digital pictures of all the exhibitors, wrote texts for them and gave this material for the students of Tampere University of Technology. They built the pages and published them on the Internet. We made the introduction of the exhibitors during the event and published the information about the website on IMEKO Congress News on 4 June, as well. Now it was impossible to find the pages on the net after these years. However, I had the list of exhibitors and original pictures of the exhibition stands in my files, and I tried to rebuild the site once again.

Press Conference on 4 June

We had invited many trade press representatives, radio and TV editors, and technical freelance journalist to a press meeting in Tampere Hall. The meeting was not very popular because the measurement area was not very well known or a main topic of the media in Finland. Many editors and editors-in-chief visited the conference, however, and we got some publicity in the trade press and even on a local radio channel as well, based on the information on the press releases and background material we sent!

The press had possibility to follow an invited presentation from Chr. Rohrbach: Man As An Extreme Sensitive Sensor For Almost All Kinds Of Radiations. The lecture by Mr. Rohrbach dealt with the human ability to sense vibrations: visible and invisible light, thermal and biological radiation, TV and radio and other technical signals, electromagnetic, geomagnetic and magnetic waves, gamma radiation, ionized radiation, etc. It was very interesting and got some space in the trade press, too.

An exhibition related to the Congress was open 4–6 June 1997. Included were more than 20 companies presenting, among other things, machine vision applications, different sensor technologies, research and applications. Journalists visited the stands and also took pictures.

Also a CD-ROM of the Congress was presented to the press on 2 June and at the press meeting.

Prints

A 4-colour technique for printing was too expensive, and in quite many prints we managed to use 4-colour grounds made by others. On them we printed text in black. This attracted good attention but also astonishment.

Posting

All material was delivered by mail to several congress places. The 16,000 brochures for the preliminary programme and the 11,000 for accompanying events were set out to the world by various means.

The days before PowerPoint

In Tampere Hall there were two service desks for arranging the slides. The photos were shown mostly in slides and arranging them, fetching them to and bringing them from the auditoriums and returning them to the lecturers, employed four persons.

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Island of Viikinsaari

We set out to the Island of Viikinsaari from the shore of Laukko, accompanied by accordion music. In use we had three ferries. At our destination, there was a buffet waiting. Arriving in the last ferry, I was told that the smoked fish had run out already in the beginning and that there were only sausages left. Quite angry, wondering how that could happen, the hostess informed me that each one of the Japanese had taken one entire fish. I wonder if this taught international eating habits to the personnel of Island of Viikinsaari.

In the sauna, there were separate sides for women and men, and there was a student in each side to "guide" how to take a sauna bath. The guide from the men's side came to tell me that he could not persuade the participants to enter separate sides of the sauna. So they all were in the same sauna together and we weren't there to be moralisers.

The swimmers were running naked to the lake and the video cameras were whirring in the bushes. Afterwards, there must have been one or more surprised watchers at home, as the guides might have been the only Finns taking the sauna bath.

Awards presented at the XIV World Congress

The International Programme Committee received 54 applications according to the rules for the György Striker award. The winner chosed was Yasuhiro Takaya from Osaka University, Japan. His title was *Study on the Laser Trapping Probe for the Nano-CMM*.

According to the resolution of the President, the Distinguished Service Award was presented to Giuseppe Zingales, Walter A. Bajek, Anthos Bray, Ewart Carson, Iwao Morishita, and Susumu Tachi.

Mrs. Barbara Striker talking to the handover of the György Striker Award. From the left Mrs. Barbara Striker, Tamás Kemeny, Olli Aumala and Aimo Pusa.

Summary
IMEKO XIV World Congress

	Participants	Total fees FIM
IMEKO XIV World Congress		
Full paid authors and delegates	441	
Extra price	1	
Students	22	
Assistance	11	
Financial aid	25	
DSA and organisers	55	
Exhibitors	24	
Staff	25	
	604	**1.168.650**
ADC Workshop		
Full paid authors and delegates	**17**	**27.910**
ISMCR'97		
Full paid authors and delegates	38	
Students	16	
Assistance		
	54	**95.780**
CD Symposium		
Full paid authors and delegates	129	
Students	3	
	132	**246.350**
Accompanying persons	66	–
Total	**873**	**1.538.690**
Tax 22 %		277.387
Total without tax		1.261.303
5 % contribution	FIM	63.065

PARTICIPANTS BY COUNTRY

Australia	3
Austria	10
Belgium	9
Brazil	6
Canada	13
Chile	1
China	5
Croatia	5
Czech Republic	18
Denmark	5
Egypt	1
Estonia	5
Finland	181
France	22
Germany	65
Hungary	5
Island	1
Italy	60
Japan	88
Kenya	2
Korea Republic	13
Lithuania	7
Malaysia	2
Mexico	2
Netherlands	6
Norway	5
Poland	44
Portugal	6
Republic of Macedonia	2
Romania	3
Russia	18
Singapore	1
Slovakia	5
Slovenia	8
South Africa	1
Spain	8
Sweden	34
Switzerland	4
Turkey	11
Ukraine	7
United Kingdom	19
USA	20
Yugoslavia	3

ADC Modelling and Testing

2nd International Workshop parallel to XIV IMEKO World Congress

Within the TC4 Measurement of Electrical Quantities a specific area was raised as a crucial topic of all modern measurements: Analogue to Digital Conversion. Specialists concentrating on this topic gathered together and setup a Working Group leaded by Pasquale Daponte (Italy), Linus Michaeli (Slovak Republic) and others. The first Workshop was held in Smolenica in the Slovak Republic. Olli Aumala participated with this Workshop and found that and the group was productive and willing to continue. The second Workshop was held only one year after the first one. Again, a good number (28) of original papers were presented. Most participants also attended to some other sessions of the World Congress. The papers of the Workshop were included in the Proceedings CD of the Congress. Needless to say, a series of further Workshops followed after these first events of the Working Group.

Closing session in Smolenica Castle. From left M. Sedlacek, O. Aumala, L. Michaeli, and P. Daponte.

Preliminary Programme

Registration Form

2nd International Workshop on

ADC MODELLING and TESTING

2 - 3 June 1997, Tampere, Finland
Parallel workshop to XIV IMEKO World Congress

Organised as a part of

IMEKO

International Measurement Confederation

XIV IMEKO World Congress
June 1-6 1997

Organised by

SAS

Finnish Society of Automation

TAMPERE A B MODELLING AND TESTING 1997

City reception

The city reception hosted by Mayor Jarmo Rantanen was really successful. Various rooms were in use of a thousand celebrants, who filled up the city hall. The catering was superb and there was enough food. After the reception, the younger participants in particular moved on to the night life of Tampere. In the city centre you could not help running into congress participants.

→ p. 61

ISMCR'97: TOPICAL WORKSHOP ON VIRTUAL REALITY AND ADVANCED MAN-MACHINE INTERFACES

June 4–5 1997 Tampere, Finland
Organised as a part of XIV IMEKO World Congress
Organised by IMEKO Technical Committee on Robotics (TC17)
and Finnish Society of Automation

National Organising Committee:
Reijo Tuokko, chairman, Tampere University of Technology
Aarne Halme, Helsinki University of Technology
Markku Kivikoski, Tampere University of Technology
Risto Kuivanen, VTT Manufacturing
Pentti Vähä, VTT Automation
Heikki Aalto, Tehdasmallit Oy
Karri Palovuori, Instrumentointi Oy
Juha Vainio, Timberjack Oy
Rolf Ström, Tamrock Oy

International Programme Committee and Members of the IMEKO Technical Committee on Robotics (TC) 17:
Prof. Susumu Tachi, chairman, The University of Tokyo
R. J. Ahlers, Germany
Y. Baudoin, Belgium
K. K. Bhutani, India
Hyung Suck Cho, Korea
Vladimir Chudy, Slovakia
Philippe Coiffet, France
Carlo Ferrero, Italy
Toshio Fukuda, Japan
Duncan B. Gilmore, Australia
K. T. V. Grattan, England
P. Kool, Belgium
Li Quig Zhong, P.R. China
Andrzej Maslowski, Poland
T. Pfeifer, Germany
B. T. Rebaglia, Italy
J. Schanda, Austria
Dusan Simsik, Slovakia
Zafar Taqvi, USA
Fernando Torres Leza, Spain
Reijo Tuokko, Finland
Jaromir Volf, Czech Republic
Xu Guangyou, P.R. China
V. D. Zotov, Russia

The 7th International Symposium on Measurement and Control in Robotics (ISMCR'97) was arranged as a Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces as part of the XIV IMEKO World Congress. The organizers of this event were the IMEKO Technical Committee on Robotics (TC17) and Finnish Society of Automation.

Virtual Reality (VR) had in the 1990s become a rapidly advancing technology, opening and shaping broadly a whole new world to industrial and non-industrial applications in a whole variety of fields. Controllability of machines, systems and processes sets constantly rising demands for the development of better and more effective man-machine interfaces. A human being with all his or her senses is able to step inside an artificial world or environment.

Development of graphical user interfaces and use of multimedia with real photos and videos have in many ways improved the quality of man-machine interface through a much more informative flow of information between the machine and the operator. In this way, more and more information has come available for operators of machines and larger systems. This technology is, however, actually a set of equipment boxes installed on a table or desk in front of the operator – a kind of monitor theatre – with limited stimulation of human senses and limited feedback and instruction information.

Virtual reality and virtual environments form a very natural further development towards more advanced human interaction. This kind of interface is not only left on the table but the operator goes inside it. Attempts are made to include most human senses, reactions and movements in man-machine interaction. The goal is a realistic environment in which the environment or the perceptions of it are so real that the operator does not feel an 'outsider' but seems to be inside the environment with the ability to operate in that synthetic world with very high interactivity.

The ISMCR'97 Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces gave a state-of-the-art perspective on virtual reality technologies and advanced man-machine interfaces. Key aspects and latest developments of virtual reality and virtual environments, virtual prototyping, advanced modelling and simulation, user interfaces, telerobotics and telepresence along with numerous interesting applications were discussed in the workshop which gathered together 60 professionals from academia and industry.

The ISMCR'97 workshop programme included two keynotes and 30 oral and 7 poster presentations from 16 countries. In addition a panel session was arranged, discussing the Implementation of VR and VE in Practice. The invited panellists representing different countries and points of view to the subject and a comprehensive expertise in the field gave an inspiring and stimulating introduction to the general discussion with the audience.

As a part of the event and IMEKO World Congress there was also a special exhibition on Virtual Reality offering demonstrations and giving a good view of commercially available products, available services and interesting research results in the field of virtual reality.

Hotels

Hotel reservations were made from the office, and everybody was supposed to make a prepayment. We had the use of 646 bed places in five different hotels. We had to increase the hotel capacity by 200 in the last two weeks.

Guiding at Helsinki-Vantaa airport

At Helsinki-Vantaa airport, our personnel was receiving the participants and guiding them to the buses heading for Tampere. There wasn't enough airline capacity to take everyone to Tampere, neither from Helsinki nor from Stockholm.

A lot and international

In the congress, with all events added together, there were 674 lectures from 45 countries.

Colour codes

World congress: light blue
CD Symposium: yellow
ADC: green
ISMCR: lilac

Financial support

Valmet Automation: FIM 30,000
IVO Group: FIM 30,000
Nokia Corporation: FIM 50,000
Academy of Finland: FIM 75,000, returned FIM 13,135,60
Finnair: FIM 40,000

Organ recital at Tampere Cathedral

Olli Aumala, the president of IMEKO, performed as an organ soloist. There was transportation to the Cathedral and after getting everybody there we noticed we had no flowers for the performers. The person responsible for the recital had to take one of the participants to the health centre and I was left to search for an open flower shop. That's why I could not participate in the recital, but the feedback was really positive.

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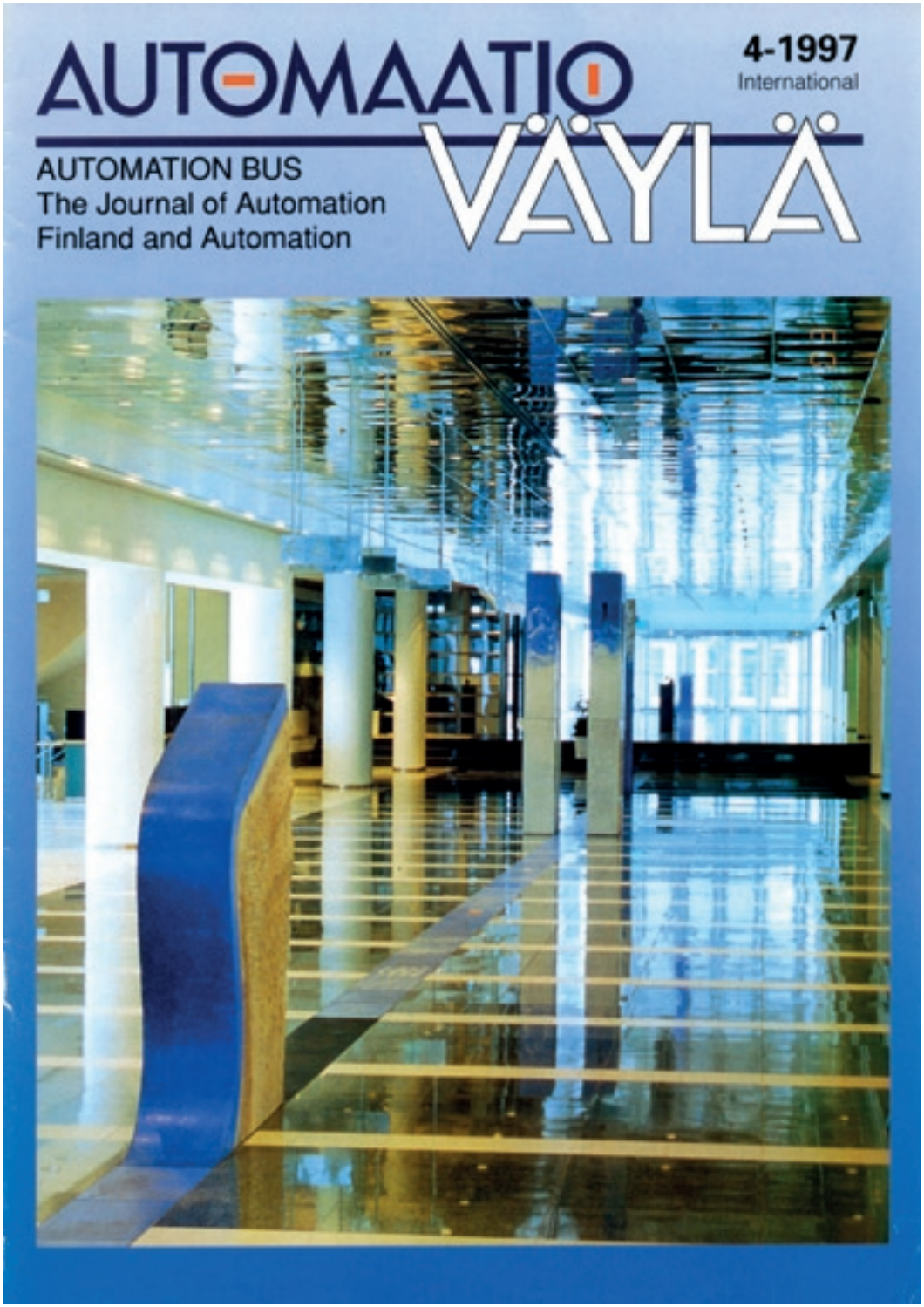
Congress staff.

Tampere Hall

During and after the congress, there were many people who were surprised how such a small group, two persons working at the office, could arrange a successful world congress. One explanation is of course the division of labour and hiring motivated temporary workers. Also significant was the role of Tampere Hall and Maarit Mikkonen. As skilled congress organisers they made sure to remind us to do things that actually had not even entered our minds. All the personnel of Tampere Hall were motivated to organise an IMEKO World Congress. Also the Tampere Convention Bureau and its personnel was a big help to us in the marketing phase. Already when things almost went wrong, we received a warning call or guiding to attend to the matter. It's no wonder that Tampere Hall has been awarded many times for being the best congress organiser.


AUTOMAATIO
VÄYLÄ
4-1997
International
AUTOMATION BUS
The Journal of Automation
Finland and Automation

CD Symposium

The paper industry has been and continues to be an integral part of the Finnish national economy. Therefore it was natural to set up an event on measurement topics within the paper industry as a satellite to the XIV IMEKO World Congress in Tampere in 1997. The longstanding series of Control Systems conferences arranged in even years and alternating between Scandinavia and Canada provided a natural cooperation partner to the Symposium in conjunction with the IMEKO World Congress. Control Systems 96 was held in Halifax, Nova Scotia, and Control Systems 98 was to be held in Porvoo, Finland, under arrangements jointly carried out by Finnish Society of Automation and KCL.

The topic of the satellite event was chosen to be "Cross Directional Web Measurements, Controls and Actuator Systems in Paper Machines" according to a suggestion by Professor Timo R. Nyberg, who also chaired the National Organizing Committee. In order to establish a strong link with the Control Systems conferences, Risto Ritala, Managing Director of KCL Development Oy, was chosen to chair the International Programme Committee, as Ritala was also the NOC and IPC of the Control Systems 98 conference and a member of the IPC of Control Systems 96. The contact and marketing channels for Control Systems events provided means of attracting both academic and industrial contributors and participants.

As paper is produced in the form of a web, a two-dimensional control problem arises: the paper quality must be managed both in time – in the running direction or 'machine direction' (MD) – and across the web, the 'cross direction' (CD). CD control is specific to the paper industry and some other web-producing industries, such as the plastic foils industry. The challenge in this control is firstly that instead of two-dimensional quality data, control must rely on scanner data, and secondly that the actuator optimization is a problem involving high-dimensional multiple-input multiple-output (MIMO, typically 1000 inputs and 100 outputs). Furthermore, on a paper machine there are several, typically 2–5, CD control systems for different quality parameters. The paper industry and its suppliers had contributed to resolving this problem by developing both the theoretical background and practical systems for more than two decades. The CD Symposium in Tampere provided an overview of these achievements and outlined future developments.

Even today CD control is an active area of research, and some of the current properties of the commercial systems were first introduced at the Tampere event. In particular contributions by the UMIST group (Stephen Duncan, Will Heath, and Peter Wellstead), the dilution headbox control presented by Valmet Automation (John Shakespeare and Juha Kniivilä), and theoretical foundations by University of British Columbia and Paprican (Guy Dumont, Michael Davies, and Sylvain Gendron) have had an impact on how CD control is done today.

The programme of the CD symposium was divided into four categories: mill experiences of practical systems, control methods, mathematical methods needed in developing CD control, and sensor systems. The programme was started with mill experiences in order to provide a perspective for the more mathematical analyses. The interaction between theory and practice and lively discussions both after presentations and during breaks was the goal set during the planning of the event, and indeed, the event was a success in this respect.

The CD symposium had 34 presentations, all oral, and attracted xx participants. The presenters represented Canada, Denmark, Finland, Germany, Japan, UK, and USA. The rapid progress in the business structure of the paper industry cluster is clearly manifested in that essentially none of the companies present at the 1997 CD Symposium exists under the same name today. Most of the changes in names also reflect company mergers. However, the overwhelming majority of people present at the event continue contribute to CD control in 2008.

Developments after the Tampere Congress

At the Closing Ceremony Kozo Iizuka took over the duties of the President. The next World Congress was held in 1999 in Osaka, Japan. IMEKO focused on Asia. The time difference was only two years, but the Congress was again a success. A need to combine Symposia of Technical Committees with the World Congress became more and more clear. This need culminated in the following Congress in Vienna in 2000, which was only one year after the Osaka Congress.

President Aumala contributes to the Visionary Panel.

Congress participants at the Opening session.

Key organizers O. Aumala and P. Uronen with international colleagues Ono, Finkelstein, Kemeny etc.

Virtual Workshops

1st and 2nd Virtual Workshops on Tools for Education in Measurement

The development of digital technology and the Internet had brought with it new possibilities to construct so-called virtual instruments and even virtual laboratories which could be operated in computers and sometimes also through the Web. IMEKO TC1 discussed the possibility of sharing ideas and exchanging contributions similarly on the Web. It noted that recent tests in remote conferencing were to some extent very promising, but on the other hand direct personal discussion was lacking. During the Vienna World Congress Olli Aumala gathered several indications of virtual instruments or systems, and so the IMEKO TC1 on Education and Training in Measurement and Instrumentation together with Tampere University of Technology applied for permission to hold the first IMEKO Virtual Workshop in 2001. This was accepted. In a short time, the necessary Committees were assembled: the Programme Committee was chaired by the Chairman of TC1, Professor Paul Regtien, and the National Organizing Committee was chaired by Olli Aumala, with members Jouko Halttunen, Kaj Söderholm and Petteri Pulkkinen, all from Tampere University of Technology. Call for papers, submission of abstracts, refereeing, submission of accepted full papers, the Virtual Workshop itself with its discussion forum; everything was organized using the Web and email. Finally IMEKO TC1 held a ”real” IMEKO TC1 Symposium arranged Virtual Versus Real Tools for Education in Measurement. Participants in the Virtual Workshop were told to use the various educational systems at their own locations to get a better feel for the possibilities and limitations. At the Symposium all authors received copies of the Proceedings (Libraries and Universities did not yet accept Web publications!).

There were 12 papers at the first workshop. A common understanding was that the workshop was a success, and a second one could also have new papers. This was also held in 2002, with 8 papers. This too was considered as a success. One of the benefits was that there was a participation fee for Proceedings only. Every interested scientist or engineer was able to participate without travelling. But after the second workshop it was evident that new contributions were so far published and a yearly workshop was not feasible. In any case, it was shown that a combination of a virtual workshop and symposium is very useful in distributing new contributions in a rapidly evolving field. Archiving requirements also have to be taken into consideration.

Olli Aumala, Jouko Halttunen, Kaj Söderholm and Petteri Pulkkinen (editors)

1ST VIRTUAL WORKSHOP ON

TOOLS FOR EDUCATION IN MEASUREMENT

PROCEEDINGS

IMEKO
INTERNATIONAL MEASUREMENT CONFEDERATION
TC1 EDUCATION AND TRAINING IN MEASUREMENT AND INSTRUMENTATION

TAMPERE UNIVERSITY OF TECHNOLOGY
INSTITUTE OF MEASUREMENT AND INFORMATION TECHNOLOGY, **MIT**
TAMPERE, FINLAND

FINNISH SOCIETY OF AUTOMATION
FINLAND

UNIVERSITY OF TWENTE
ENSCHEDE, THE NETHERLANDS

Tampere 2001

International events

organized by Finnish Society of Automation and/or Finnish Automation Support Ltd

YEAR	EVENT & VENUE	ORGANIZERS*	
2009	IFAC Symposium on Power Plants and Power Systems Control , **PP&PS'09** Tampere Hall	FSA, TUT	IFAC
2009	IFAC Workshop on Control Applications of Optimisation, **CAO'09** Agora, University of Jyväskylä	FSA, University of Jyväskylä	IFAC
2008	OPC Road Show, VTT	FSA, HUT	
2007	OPC Road Show, VTT	FSA, HUT	
2004–2007	Automation – at your service, exhibition The Finnish Science Centre Heureka, 20.3.2004-6.3.2005 Ciencia Viva, Portugal, 12.10.2005–15.8.2006 MUTEX, Mexico City, 9.10.2006-4.2.2007 UNAM, Mexico City, 19.2.2007–20.11.2007	FSA, The Finnish Science Centre Heureka	
2006	OPC Road Show, Helsinki University of Technology	FSA, HUT	
2006	The 47th Conference on Simulation and Modelling, **SIMS 2006**, Helsinki	FSA, OULU	SIMS
2006	1st IFAC Workshop on Applications of Large Scale Industrial Systems, **ALSIS' 06**, Helsinki-Stockholm-Helsinki	FSA, OULU	IFAC
2006	**Control Systems 2006** – Measurements and control – applications for the operator, Holiday Club, Tampere Spa	FSA, TUT, PI, SPCI, PAPTAC	
2005	IEEE International Symposium on Computational Intelligence in Robotics and Automation, **CIRA2005**, Helsinki University of Technology	HUT, FAS	IEEE
2005	OPC Road Show, Helsinki University of Technology	FSA, HUT	
2004	IFAC 2nd Workshop Advanced Fuzzy/Neural Control, **AFNC'04**, University of Oulu	FSA, University of Oulu	IFAC
2004	1st IFAC Symposium on Telematics Applications in Automation and Robotics, **TA04**, Helsinki University of Technology	FSA, HUT	IFAC
2003	The 3rd International Symposium on Open Control Systems**, Soft Sympo 03**, Helsinki Fair Centre	FSA, TUT, HUT	
2003	The 6th IFAC Symposium on Advances in Control Education, **ACE03**, University of Oulu	FSA, University of Oulu	IFAC
2002	OPC Road Show, Helsinki University of Technology	FSA, HUT, VTT	

2002	The 43rd Conference on Simulation and Modelling, **SIMS2002**, University of Oulu	FSA, University of Oulu	SIMS
2002	Tools for Education in Measurement, 2nd On-line workshop	FSA IMEKO	IMEKO
2001	The 3rd International Conference on Field and Service Robotics, **FSR2001**, Helsinki University of Technology	FSA, HUT	
2001	The 2nd International Symposium on Open Control Systems, **Soft Sympo 2001**, Helsinki Fair Centre	TUT, HUT, FSA	
2001	Tools for Education in Measurement, 1st Virtual workshop	IMEKO, FSA	IMEKO
2000	Future Trends in Automation in Mineral and Metal Processing, **MMM2000**, m/s Silja Serenade Hki-Tukholma-Hki	IFAC, FSA	IFAC
2000	Millennium of Artifical Intelligence, **SteP 2000**, Helsinki University of Technology	FAIS, FSA	FAIS
1998	Quality Management with Machine Vision, Innopoli, Espoo	FSA, VCF	
1998	Information tools to match the evolving operator role, **Control Systems 98**, Porvoo, Haikko	FSA, KCL, PI, SPCI, PAPTAC	
1997	The **IMEKO XIV World Congress**, New Measurement – Challenges and Visions, Tampere Hall	IMEKO, FSA	IMEKO
1997	The 2nd International Workshop on ADC Modelling and testing, **ADC97**, Tampere Hall	IMEKO, FSA	IMEKO
1997	The 7th Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces, **ISMCR'97**, Tampere Hall	IMEKO, FSA	IMEKO
1997	Cross Directional Web Measurements, Controls and Actuator Systems in Paper Machines, **CD Symposium 97**, Tampere Hall	IMEKO, FSA	IMEKO
1995	The 2nd Conference on Intelligent Autonomous Vehicles, **IAV'95**, Helsinki University of Technology	IFAC, FSA	IFAC
1994	Fault Detection Supervision and Safety for Technical Processes, **Safeprocess' 94**, Helsinki University of Technology	IFAC, FSA	IFAC
1993	13th International Conference on Force and Mass Measurement, **Force and Mass 1993**, Helsinki Fair Centre	IMEKO, FSA	IMEKO
1991	IFAC Workshop on Expert Systems in Mineral and Metal Processing	IFAC, FSA	IFAC
1990	International Conference on Instrumentation automation in Pulp and Paper Industry, **Control Systems 90**	FSA, PI, SPCI, PAPTAC	
1990	7th Symposium on Technical Diagnostics	IMEKO, FSA	IMEKO

1990	4th Symposium on Temperature and Thermal Measurement in Industry and Science, Helsinki Fair Centre	IMEKO, FSA	IMEKO
1988	3rd IFAC/IFIP/IEA/IFORS Conference on Man-Machine Systems – Analysis, Design and Avaluation, **MMS88**, University of Oulu	IFAC,FSA	IFAC
1988	2nd Symposium on Metrological Assurance for Environmental Control	IMEKO, FSA	IMEKO
1986	1st IFAC Workshop on Digital Image Processing in Industrial Applications, **VISION CONTROL**, Helsinki University of Technology	IFAC, FSA	IFAC
1983	4th IFAC Symposium on Automation in Mining, Mineral and Metal Processing, **MMM1983**, Helsinki University of Technology	IFAC, FSA	IFAC
1982	1st IFAC Workshop on Modelling and Control of Biotechnical ProcessesVTT	IFAC, FSA	IFAC
1978	IFAC/IFIP Workshop on Real Time Programming, Arkipelag, Mariiiehamn, Åland	IFAC, FSA	IFAC
1978	The **7th Triennial World Congress** of the International Federation of Automatic Control, Helsinki University of Technology	IFAC, FSA	IFAC
1971	IFAC/IFIP 3rd International Conference on Digital Computer Applications to Process Control, Helsinki University of Technology	IFAC, FSA	IFAC

English shortname*		**Finnish shortname**
FSA	The Finnish Society of Automation (12.8.1991–)	SAS
	Finnish Society of Automatic Control (18.10.1958–12.8.1991)	SSS
	Teollisuuden Mittaus- ja Säätöteknillinen Kerho – Industrins Mät- och Regleringstekniska Klubb (8.7.1953 – 18.10.1958)	TMSK
IFAC	International Federation of Automatic Control	IFAC
IMEKO	International Measurement confederation	IMEKO
PI	Finnish Paper Engineers' Association	PI
SPCI	The Swedish Association of Pulp and Paper Engineers	
PAPTAC	Pulp and Paper Technical Association of Canada	
KCL	Keskuslaboratori – Centrallaboratorium (KCL)	KCL
VCF	Vision Club of Finland	VCF
HUT	Helsinki University of Technology	TUT
TUT	Tampere University of Technology	TTY
OULU	Oulu University	Oulun yo
FAIS	The Finnish Artificial Intelligence Society	STeS
FAS	Finnish Automation Support Ltd (28.3.1985–)	ATU

Books/Proceedings/CD made by Finnish Society of Automation

(Congress proceedings are not listed, orders to IFAC or to IMEKO)

PUBLICATION	SERIES nr (ISSN 1455-6502)	ISBN nr	for sale
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INTERNATIONAL MEMBERSHIPS
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IFAC – International Federation of Automatic Control
IMEKO – International Measurement Confederation
SIMS – Scandinavian Simulation Society
EUROSIM – Federation of European Simulation Societies
EMVA – European Machine Vision Association

NATIONAL MEMBERSHIPS
of Finnish Society of Automation

SESKO – Electrotechnical standardization in Finland
TSK – The Finnish Terminology Centre TSK
TSV – Federation of Finnish Learned Societies
FINEL – Association of Electrical, Electronics and Automation Societies in Finland

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IMEKO Delegate 1975–1991
IMEKO Committee, Chairman, 1982–2005
IMEKO Symposium on Metrological Assurance for Environmental Control, NOC, Member, 1988
IMEKO TEMPMEKO, NOC, Member, 1990
IMEKO Symposium On Technical Diagnostics, NOC, Member; IPC, Chariman, 1990
IMEKO President Elect, Chairman of Technical Boardin, 1991–1994
IMEKO TC 7 Measurement Science, Member, 1993–
President of IMEKO, 1994–1997
MEKO ADC Workshop, NOC, Responsible person, 1996
XIV IMEKO World Congress, NOC and IPC, Member, 1995–1997
Designer of IMEKO Pendant, 1997
Past President of IMEKO and Chairman of the Advisory Board, 1997–2000
IMEKO Virtual Workshop on Tools for Education in Measurement, NOC and IPC, Member and Editor, 2001
IMEKO On-Line Virtual Workshop on Tools for Education in Measurement, LOC, IPC, Chairman and Editor, 2002
IMEKO Advisory Board, Secretary, 2000–03
IMEKO TC1, Education and Training in Measurement and Instrumentation, Member, 2001–
IMEKO Advisory Board, Honorary Member, 2003–

Graubner Heinz K.
IMEKO TEMPMEKO, NOC, Chairman; IMCTC 12, Member and Editor, 1990
IMEKO Comittee, Member, 1987–1993
IMEKO TC 12, Temperature and Thermal Measurements, Member 1993–

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IMEKO ISMCR'97, NOC, Member, 1997

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IMEKO Committee, Member, 1987–1993; Secretary, 1989; Chairman, 2006–
IMEKO TC4, Member
XIV IMEKO World Congress, NOC, Member; IPC, Vice Chairman; Editor, 1995–1997
IMEKO CD Symposium97, NOC, Member
IMEKO Virtual Workshop on Tools for Education in Measurement, LOC and Editor, 2001
IMEKO On-Line Virtual Workshop on Tools for Education in Measurement, LOC and Editor, 2002
IMEKO General Council, Finnish delegate since 2004

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IMEKO Committee, Member, 1982–1984

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IMEKO CD Symposium97, NOC, Member

Karaila Ilkka
IMEKO TEMPMEKO, NOC, Member, 1990

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IMEKO Symposium On Technical Diagnostics, Marketing and PR Team, Member, 1990

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IMEKO Symposium On Technical Diagnostics, Exhibition Committee, Member, 1990
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Lautala Pentti
IMEKO Symposium On Technical Diagnostics, NOC and IPC, Member, 1990

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IMEKO Virtual Workshop on Tools for Education in Measurement, IPC, Member, 2001

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IMEKO Committee, Member, 1982–1993
XIV IMEKO World Congress, NOC, Chairman, IPC, Member, 1995–1997
IMEKO General Council, Finnish delegate, 1990–
IMEKO IC on Force and Mass Measurement, NOC, Chairman, 1993
IMEKO TC-3, Technical Committee for Mass, Force and Torque, as Finnish delegate and Technical Secretary since 1978

IMEKO Technical Board, Member, 2001–

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IMEKO TEMPMEKO, NOC, Member, 1990

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IMEKO Symposium On Technical Diagnostics, Exhibition Committee, Chairman, 1990

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XIV IMEKO WC, IPC, Member, 997
IMEKO CD Symposium97, NOC, Member; IPC, Chairman, 1997

Ruokonen Tuula
IMEKO Committee, Member, 1991–1993

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IMEKO TC Measurements in Robotics, Member, 1993
IMEKO Committee, Member, 1993
XIV IMEKO World Congress, IPC, Member, 1997
IMEKO ISMCR'97, NOC, Chairman; IPC, Member, 1997

Tuomi Paavo
IMEKO Committee, Member, 1991–1993
IMEKO General Councilin, Member, 1993–
XIV IMEKO World Congress, NOC, Member, 1995–1997
IMEKO Technical Board, Member, 1997–2000

Uronen Paavo
XIV IMEKO World Congress, NOC, Member; IPC, Chairman, 1995– 1997

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IMEKO Symposium on Metrological Assurance for Environmental Control, NOC, Member, 1988

Venäläinen Pirjo
XIV IMEKO World Congress, Secretary, 1997
IMEKO ADC97 Workshop, Secretary, 1997
IMEKO ISMCR'97, Secretary, 1997
IMEKO CD Symposium97, Secretary, 1997

Vähä Pentti
IMEKO ISMCR'97, NOC , Member, 1997

Some IMEKO abbreviations

AB, Advisory Board
GC, General Council
IPC, International Programme Committee
LOC, Local Organising Committee
MO, Member Organization
NOC, National Organising Committee
TB, Technical Board
TC, Technical Committee
WC, World Congress

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CO-OPERATING SOCIETIES

IEEE – Instrumentation and Measurement Society
IFAC – International Federation of Automatic Control
IFIP – International Federation of Information Processing
IMACS – International Association for Mathematics and Computers in Simulation

Exhibitors of XIV IMEKO World Congress 1–6 June 1997

Automaatioväylä, Finland
Automaatioväylä (Automation Bus) is the leading Finnish professional periodical covering the automation field.

Dantec Measurement Technology A/S, Denmark
Manufactures laser based high precision optical measuring equipment for non-contact speed and length measurements.

Elsevier Science Ltd, The Netherlands
Publisher of journals, books and major reference works across a range of subject areas including field of measurement.

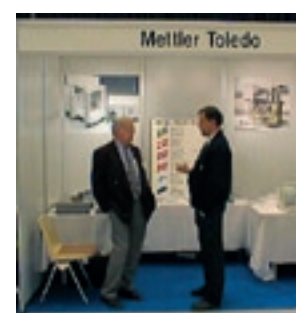
Finnish Society of Automation, Finland
The Finnish Society of Automation (FSA) founded in 1953 is a professional association for specialists within the field of automation technology including trade, research, manufacturing, education, design and use. FSA is the national member of IMEKO.

Institute of Physics Publishing, UK
Publishers of books, journals, magazines and reference works in physics and related subjects.

IRT Finland Oy, Finland
Sales and service for IRT products. IRT=Infrarödteknik Ab, Vänersborg, Sweden
IRT products are used by paper and automobile industry.

IVO Group, Finland
The second largest power company in the Nordic countries. The IVO Technology Center, which is a part of the IVO Group, includes Energy Measurement Business Unit.

Maci Oy, Finland



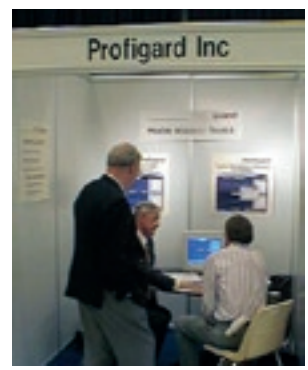
Mettler Toledo, Switzerland
Manufacturer of laboratory balances and mass comparators.

NC-Point Oy / Heidenhain, Finland
Systems for Machine Tool Inspection and Acceptance Testing, Marketing and Service

Österreichische Gesellschaft für Mess- und Automatisierungstechnik (ÖGMA), Austria
Austrian member organisation of IMEKO.

Rütter Process Instrumentation / Sintrol Oy, Finland
A manufacturer of QUADRA-BEAM N.I.R. analyzers for measurement of moisture, coating and sheet thickness and Profile Video Display Systems for profile measurement of moisture, coating and film thickness.

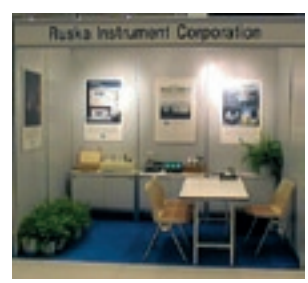
Neles-Jamesbury, Finland



Profigard Inc, Canada
Develops and sells "knowledge-based" products used in automatic process control of pulp and paper making processes.

The Society of Instrument and Control Engineers, Japan
National member organisation of IMEKO

Nordtest, Finland
Nordtest is a joint Nordic Body in the field of technical testing.



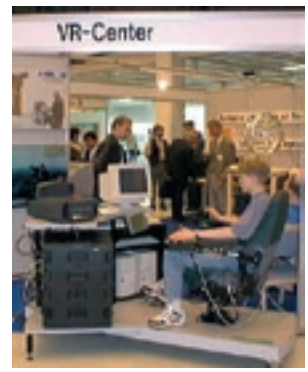
Ruska Instrument Corporation, UK
Develop and manufacture the highest quality primary and transfer pressure standards used in a variety of applications worldwide.

Oy Spectris Finland Ab, Finland
Import, sales and service of strain gauge technology based transmitters to the Finnish industry.

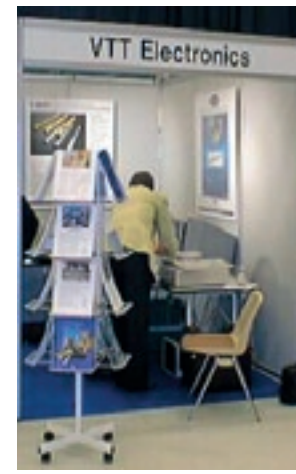
The Swedish National Testing and Research Institute (SP), Sweden
Technical evaluation, testing, certification, metrology and research.

Tampere University of Technology, Finland
TUT gives higher education, does research and co-operates with industry.

Tapio Technologies Oy, Finland
Paper samples measurements with TAPIO-analyzer provide fast and easy to understand solutions for optimising paper machine performance.



VR-Center, Finland
Co-operative organisation in the field of virtual technology hardware, software, research and education. Exhibition organisation: VTT Manufacturing Technology, Tampere University of Technology, Silicon Graphics, Tehdasmallit, Plustech.



VTT Electronics, Finland
VTT Electronics is a highly specialised R & D unit of VTT in Finland. The expertise of VTT Electronics is in Electronic Circuits and Systems, Embedded Software, Microelectronics and Optoelectronics.

XIV IMEKO WORLD CONGRESS

NEW MEASUREMENTS - CHALLENGES AND VISIONS

Tampere, Finland
1 - 6 June 1997

Press Release, 10 June 1997

The IMEKO World Congress in Tampere was bigger than ever

About 800 participants and over 500 presentations from 47 countries

The XIV IMEKO (International Measurement Confederation) World Congress in Tampere, Finland on 1 - 6 June 1997 was a real success. The theme of the congress was "New Measurements - Challenges and Visions". The programme covered the subjects of the 16 Technical Committees of IMEKO along with measurement in the important areas of the pulp and paper industry, telecommunications and the environment. In connection with the Congress there were "2nd International Workshop on ADC Modelling and Testing", "ISMCR'97 Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces" and "International CD Symposium". The special exhibition of the World Congress had over 20 exhibitors.

The congress programme contained more than 350 oral and 120 poster presentations, several round-table discussions, the conclusion of the congress with a visionary panel, exhibition, wide social programme and visits to Finnish industry, research centres and universities. You will find the abstracts of the presentations and the contact information of the exhibitors on the **IMEKO Home Page: http://www.ee.tut.fi/mit/imeko/**

The programme was supplemented by papers by the eminent invited plenary speakers: *R. Isermann, Germany, "Supervision, fault detection and diagnosis - advanced methods and applications", J. Kuusi, Finland, "Technology gallop - increasing challenges for measurement", Chr. Rohrbach, Germany, "The man as an extreme sensitive sensor for almost all kinds of radiation's" and B. Athané, France, "Present and future trends in international legal metrology co-operation".*

The venue for the whole technical programme of the congress was Tampere Hall. The number of participants was about 800, which ensured a versatile and wide view of the measurement. The congress was an exceptional opportunity to make international contacts, to meet colleagues and above all to find out the latest developments, achievements, challenges and visions in the field of measurements. The language of the congress was English.

2nd International Workshop on ADC Modelling and Testing, 2 - 3 June 1997

The aim of the Workshop was to focus on the fundamental problems of Analog to Digital Converter modelling and testing. The programme included 17 oral and 10 poster presentations.

ISMCR'97, 4 - 5 June 1997

The ISMCR'97 Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces offered an unique opportunity to obtain a state-of-the-art perspective of virtual reality technologies and advanced man-machine interfaces. Over 40 papers were presented in technical and poster sessions, including three keynote presentations and one topical panel. Key aspects and latest developments of virtual reality and virtual environments, virtual prototyping, advanced modelling and simulation, user interfaces, telerobotics and telepresence along with numerous interesting applications.

As part of the event and the IMEKO World Congress there was also a special exhibition on Virtual Reality offering demonstrations and giving a good view of commercial VR-products, available services and interesting research results in the field.

International CD Symposium´97

On 4 - 5 June 1997 an International CD Symposium was organised for the first time. The symposium concentrated on cross-directional web measurements, controls and actuators in paper and board machines. During the two days, 37 papers were presented at oral sessions. The papers dealt with practical experiences of mills, control systems, mathematical methods and new sensors. The speakers were from all major paper manufacturing countries.

György Striker Award (GSA) for a junior university staff member

The György Striker Award 1997, worth USD 1.000, was given on 5 June to a young Japanese scientist Yasuhiro Takaya (Osaka University, Faculty of Engineering).

See you in Osaka, Japan June 13 - 18, 1999!

The XV IMEKO World Congress will be held in Osaka, Japan on 13 - 18 June 1999. The theme of the congress is "Measurement to Improve the Quality of Life in the 21st Century -- Measurement Co-ordinates Nature with Human Activities". You will find more information on **the Home Page: http://imeko99.mecha.osakafu-u.ac.jp/**

IMEKO Congress News

Volume1, Issue 1 *2 June 1997*

CHANGES AND CORRECTIONS TO FINAL PROGRAMME

- Page 9 TC 4: 16.15 (not 14.00)
- Page 28 Chairman: A. Barwicz
- Page 55-57 The place will be Hall E (not room 200)
- Page 56 III ADC-session will end at 17.30 (not 16.40)
- Page 68 The full registration fee includes also the farewell party
- Page 74 Correct registration fees: the same as for ISMCR'97 (see page 72).
- The student fee does not include Get together party
- Page 87 Badges: correct dates for ADC Workshop (green line) are 2-3 June 1997.

Technical Board meeting on Tuesday 3 June will continue 12.30 - 14.00 in Hotel Rantasipi.

ATTENTION CHAIRMEN AND CO-CHAIRMEN!
Please, notice these following cancellations!
CANCELLED PRESENTATIONS:

DATE	TIME	SESSION NUMBER	TOPIC	AUTHORS
2.6. 1997	12.30 - 12.50	4.1	PC controlled instruments and a measurement system operated via computer interfaces	Z. Moron K. Tabisz
3.6.1997	11.00 - 11.20	3.4	The experimental research on dynamic calibration of force transducers	Y. Zhang
4.6.1997	12.20 - 12.40	12.1	Reproduction of the ITS-90 using small cells in a heat pipe in calorimetric conditions.	J.Valencia-Rodriguez V.Martinez-Fuentes
4.6.1997	11.40 - 12.00	14.6	Surface roughness measurement by the transfer function of the optical pattern imaging system	T. Inari
4.6.1997	15.25 - 15.45	7.4	The framework of measurement science	Q. Yang C. Butler
5.6.1997	12.20 - 12.40	13.3	A very low current density probe for in-vitro measurement	R. Claverie C. Goeury P. Schweitzer G. Prieur
5.6.1997	14.45 - 15.05	1.2	Teaching of the electrical of the electrical motors' diagnostics	L. Swedrowski

CHANGES FOR CHAIRMEN

DATE	TIME	SESSION NUMBER	CHAIRMAN	CO-CHAIRMAN
2.6.1997	10.45 -12.10	10.1	D. Barschdorff	**G. Rossi**
2.6.1997	14.00 - 15.45	10.2	K. Leiviskä	**G. Rossi**
2.6.1997	16.15 - 18.00	3.3	**J. Robles**	A. El-Sayed
2.6.1997	10.45 - 12.50	4.1	M. Savino	M. Sedlácek
3.6.1997	14.00 - 15.45	3.6	**G. Robinson**	A. Pusa
3.6.1997	14.00 - 15.45	14.5	**P.H. Osanna**	J. Paakkari
4.6.1997	13.40 - 16.05	7.4	**A. Barwicz**	P. Vehviläinen
5.6.1997	14.00	TC 4	**M. Savino**	

Get together in Näsinneula

Sunday 1 June was "the first summer evening" in Tampere this year! IMEKO XIV World Congress had its Get together party in Näsinneula restaurant. You cannot imagine more beautiful weather for such an evening. It was nice to meet friends and colleagues, eat some Finnish specialities and enjoy refreshing drinks.

Somebody would like to discuss about your poster!

Dear Poster Authors! Please mark on the lists your time schedule - all the hours you will have

The view from Näsinneula is incredible. The guests could even see a fire somewhere in horizont.

Note! Evening of Music and Fine Arts will begin 18.00 on Tuesday 3 June!

The timetable behind the tickets for Evening of Music and Fine Arts is wrong. You can find the right time schedule on the Final Programme (page 81) and on the information board in your hotel.

SMOKE GETS ON YOUR EYES -

BUT NOT IN TAMPERE HALL!

PLEASE DO SMOKE OUTSIDE.

IMEKO Congress News

Volume1, Issue 2 *3 June 1997*

Changes for Chairmen

- 3.6.1997 Session 16.1 at 10.15 - 13.20, Chairman N.D. Samaan, Go-Chairman **M. Rantanen**
- 4.6.1997 Session 4.7 at 10.15 - 12.20, Chairman V. Kellner, Go-Ghairman **H. Jokinen**
- 5.6.1997 Session 4.11 at 14.00 - 15.25, Chairman P. Daponte, Go-Chairman **H. Ihalainen**

A new presentation on 5.6.1997 at 15.25 - 15.45
Session 4.11 in Small Auditorium:
- **Measure and reconstruction techniques for power measurements on high efficiency variable speed drives** (F.

Question of the day: When and where will be held IMEKO XV World Congress? You will find the right answer in Exhibition hall.

Opening Ceremony of the XIV World Congress of IMEKO

Jarl-Thure Eriksson
Rector Magnificus
Tampere University of Technology

Distinguished Guests,
Ladies and Gentlemen.

The history of measurement goes back to ancient times. It is a common belief that mathematics became into being because it was needed in the assessment of land areas. Remarkable skills in mathematics and geometry were also developed for astronomic purposes. Astronomy was vital for navigation. According to Plinius, a Roman admiral and scholar of the first century, the concept of magnetism originates from Magnes, a Greek shepard, who, while he was tending his sheep, observed that the iron shoe of his shepard's crook swinged towards the sandel clasp. This was the first magnetic detector.

Galileo Galilei is known as the father of empirical science. In addition to the famous Pisa Tower experiment his attampt to measu-re the speed of light belongs to the history of science. He was standing on the top of a hill and Torricelli on another, both had a burning candle partly covered by a bucket. Galilei uncovered his candle and simultaneously turned a sandglass. When Torricelli saw the light, he in his turn lifted the bucket. Finally, Galilei upon observing the returning light signal indicated the elapsed time. Evidently the accuracy of the measuring system was not

IMEKO TC 11 Round Table
Confidence in Measurements

June 3, 1997
2 p.m. Hall A

Invited Speakers

- Globalization of Trade Calls for Globalization of Metrology
(Prof. V. Kose, Vice-President of the Physikalisch-Technische Bundesanstalt, PTB)
- The Metrological Confidence in Industry
(A. Pusa, Raute Precision Oy, Finland)
- Operation of National Calibration Services
(Dr. Ugur, Director, National trology Institute, Turkey)
- Metrology in a Small Country
(Dr. Drnovsek, Standards and Metrology Institute, Slovenia)
- EUROMET and the Importance of Regional Activities
(Dr. Carneiro, Chairman, EUROMET)
- Metrology Cooperation in Africa
(A.O. Oyejola, Secretary-General, African Regional Organization for Standardization, ARSO)
- World-Wide Cooperation in Metrology
Current and Future Tasks of the BIPM and the Convention du Mètre
(Dr. T.J. Quinn, Director, International Bureau of Weights and Measures, BIPM)
- Confidence in Legal Metrology Measurements
(B. Athané, Director, International Bureau of Legal Metrology, BIML)
- Globalization, A New Challenge for Metrology Professionals
Current and Future Tasks of IMEKO TC 11
(Dr. E. Seiler, Chairman, IMEKO TC 11 Metrological Infrastructures)

Opening Ceremony ...

good enough at the time. However, since then the path to progress has been laid down by the method of trial and error.

The development of science has been characterized by the interplay between the experimentalist and the theoretician, a dance of dual partners. New measurement mehods have facilitated new theories and new physics. Novel understanding has in turn resulted in more sophisticated measuring methods. This is one of the secrets to the success of natural science. The methods are slowly penetrating all disciplines. A recent step forward has been the tomographic imaging of the brain, hence building a bridge between biology and psychology.

"It is an honour for Tampere University of Technology to host the IMEKO

When we look at various areas of engineering and science, we can see sophisticated measurement apparatus and methods everywhere. Environmental and biomedical sciences are just two examples of fields, wherein reliable and correlated information is required about the conditions of life continuation and human welfare.

It is an honour for Tampere University of Technology to host the IMEKO congress. I would like to take the opportunity of telling something about Tampere and our University.

The name of Tampere consists of T for Tesla and ampere for electrical current. As You very well know Tesla is the equivalent of Volt-second per square meter. After some manipulation Tampere stands for energy per unit area, i.e. energetic intensity. I think this figure is very high right now in the Tampere Hall. Be it also a metaphor of the work at TUT.

Tampere University of Technology was founded in 1965. The current number of undergraduate students is around 7000, but we expect an increse of 2000 until the turn of the century. The number of post graduate students is 950. Annually around 600 students receive their diploma degree, while 70 postgraduates take their licentiate or doctor's degree. The permanent staff is 1100 whereof 10 % are professors and associate professors. Tampere University of Technology has paid special attention to the creation of fruitful contacts with the industry. Almost one half of the activities is financed through private contracts.

The University is divided into nine departments. The largest ones are those of Mechanical Enginering, Electrical Engineering and Information Technology. The Department of Environmental Science is very popular especially among female students. The Institute of Measurement Technology headed by our host Professor Olli Aumala belongs to the Department of Automation. Thanks to Professor Aumala's activities the institute has created fruitful contacts not only inside Finland but also in the international context.

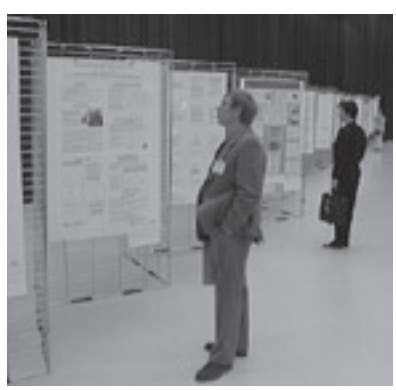
Ladies and Gentlemen

On behalf of Tampere University of Technology I wish You cordially welcome to Tampere. At the same time I should like to express my warmest thanks and my appreciation to the organizers and all those who have prepared this event.

I hope the presentations will raise new issues of interest and lead to constructive

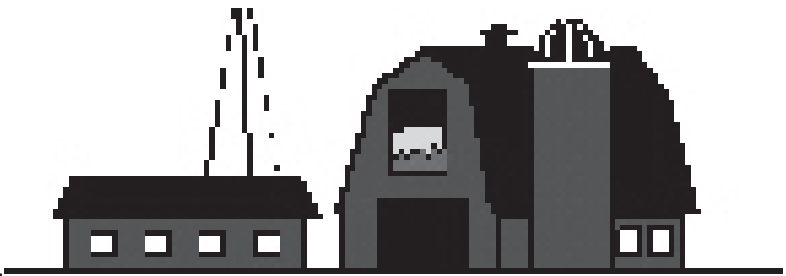
Don't forget Posters and Exhibition!

There are 120 poster presentations and over 20 exhibition stands. Please, take a look!



IMEKO Congress News

Volume 1, Issue 3 *4 June 1997*



A relaxing day on a Finnish farm

Thursday, 5 June 1997, 10.00 - 15.00

On Final Programme there is wrong departure time (at 9 am.) for this trip. However, all information on the ticket is OK! Departure by bus will leave at 10 am. from Tampere Hall.

A march-past of Finnish army

on Wednesday 4 June at 14.00!

Finnish army is celebrating the 130th birthday of Marshal C. G. E. Mannerheim on 4 June 1997. There will be a parade also in Tampere.

The parade will pass Tampere Hall at 14.00. There will be an over flight, too, if the weather is good enough.

Commander of the parade troops is Colonel Erkki Eskelinen.

Colonel Jouko Oittinen (Head of the Military Material Centre) will receive the parade.

During the parade you will se some lion flags of Finnish army on the flagpoles of Tampere Hall.

It's worth to see!

Notice!

- TC 16 Meeting on 5 June 1997 at 10.15 is in Room 200.

- The meeting of TC 10 will be arranged on Wednesday 4 June 1997 at 13.30 in Room 305.

All participants are welcome!

- TC 11 on 5.6.1997 at 14.00 will be in Room 307 (not in Speakers Room).

Changes in Chairmen / Go-Chairmen

DATE	TIME	SESSION	CHAIRMAN	CO-CHAIRMAN
4.6.1997	13.40 - 16.05	**7.4** Theory and fundamental principles of measurements	**A. Barwicz**	P. Vehviläinen
4.6.1997	10.15 - 12.20	**14.6** Surface shape and defect measurements	R. Furutani	**P. Vehviläinen**
5.6.1997	9.00 - 11.15	ISMCR'97 VI Telerobotics and telepresence	**M. Sato**	M. Siuko
5.6.1997	14.00 -	**TC 4** meeting	**M. Savino**	
5.6.1997	14.00 - 15.25	**4.11** Applications on electrical systems	P. Daponte	**H. Ihalainen**

Exhibitors of XIV IMEKO World Congress 1 - 6 June 1997
will be in Internet

All the exhibitors and their contact numbers and addresses will be presented also on the Internet pages of IMEKO XIV World Congress. We will take pictures on exhibition stands and get more information about the companies.

The Swedish National Testing and Research Institute (SP) is an institute for technical evaluation, testing, certification, metrology and research.

Oy Spectris Finland Ab imports, sells and services strain gauge technology based transmitters. Maci Oy / NDC Systems is delivering on-line gauging systems for the paper machine.

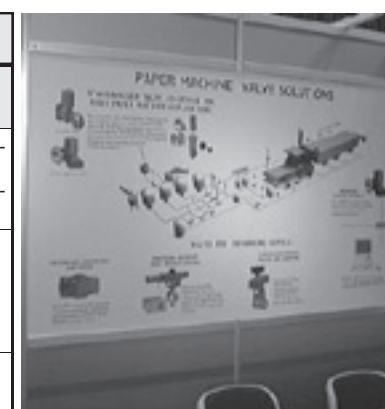
There are more than 20 exhibitors in the showroom of Tampere Hall.

On Wednesday 4 June there will be some new companies. Their products and services are related to "ISMR'97 Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces" and "Internatio-nal CD Symposium 1997".

Please, take a look. You will find something new!

Cancelled precentations

DATE	TIME	SESSION NUMBER	TOPIC	AUTHORS
4.6.1997	12.20 - 12.40	12.1	Reproduction of the ITS-90 using small cells in a heat pipe in calometric conditions.	J. Valencia-Rodriguez V. Martinez-Fuentes
4.6.1997	11.40 - 12.00	14.6	Surface roughness measurement by the transfer function of the optical pattern imaging system	T. Inari
4.6.1997	16.20 - 16.40	ISMCR'97 Session V	Speed-up techniques for soft shadow generation	T. Möller
5.6.1997	12.20 - 12.40	13.3	A very low current density probe for in-vitro measurement	R. Claverie C. Goeury P. Schweitzer G. Prieur
5.6.1997	14.45 - 15.05	1.2	Teaching of the electrical of the electrical motors' diagnostics	L . Swedrowski



Neles-Jamesbury is presenting paper machine valve solutions.

IMEKO Congress News

Volume 1, Issue 4 *5 June 1997*

Thank You! Wellcome again!

Jouko Halttunen (in front from the left), Olli Aumala and Aimo Pusa with the students of Päivölä Institute and Tampere Univesity of

The members of Organising Committees would like to thank all participants and exhibitors for visiting the XIV IMEKO World Congress. Special thanks for all the staff, voluntary people and students who made this Congress possible!

We hope you had a good time in Tampere Hall and in our social programme, and wish you a pleasant journey back home.

We'll se again, somewhere, sometimes...

The IMEKO World Congress was bigger than ever

Over 800 participants and 535 presentations from 47 countries

The XIV IMEKO (International Measurement Confederation) World Congress in Tampere, Finland on 1 - 6 June 1997 was a real success. The theme of the congress was "New Measurements - Challenges and Visions". The programme covered the subjects of the 16 Technical Committees of IMEKO along with measurement in the important areas of the pulp and paper industry, telecommunications and the environment. In connection with the Congress there were "2nd International Workshop on ADC Modelling and Testing", "ISMCR'97 Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces" and "Internatio-nal CD Symposium". The special exhibition of the World Congress had over 20 exhibitors.

The congress programme contained more than 350 oral and 120 poster presentations, several round-table discussions, the conclusion of the congress with a visionary panel, exhibition, wide social programme and visits to Finnish industry, research centres and universities. You will find the abstracts of the presentations and the contact information of the exhibitors (coming soon) on the **IMEKO Home Page: http://www.ee.tut.fi/mit/imeko/**

Mrs. Barbara Striker and Olli Aumala, the President of IMEKO, will give the György Striker Award to a young Japanese scientist during the Closing Ceremony of the XIV IMEKO World Congress in Tampere Hall on 5 June 1997.

The programme was supplemented by papers by the eminent invited plenary speakers: *R. Isermann, Germany, "Supervision, fault detection and diagnosis - advanced methods and applications", J. Kuusi, Finland, "Technology gallop - increasing challenges for measurement", Chr. Rohrbach, Germany, "The man as an extreme sensitive sensor for almost all kinds of radiation's" and B. Athané, France, "Present and future trends in international legal metrology co-operation".*

The venue for the whole technical programme of the congress was Tampere Hall. The number of participants was over 800, which ensured a versatile and wide view of the measurement. The congress was an exceptional opportunity to make international contacts, to meet colleagues and above all to find out the latest developments, achi-evements, challenges and visions in the field of measurements. The language of the congress was English.

2nd International Workshop on ADC Modelling and Testing, 2 - 3 June 1997

Check the information board near the desk of the Secretariat. There are many personal messages!

Congress bigger than ever...

The aim of the Workshop was to focus on the fundamental problems of Analog to Digital Converter modelling and testing. The programme included 17 oral and 10 poster presentations.

ISMCR'97, 4 - 5 June 1997

The ISMCR'97 Topical Workshop on Virtual Reality and Advanced Man-Machine Interfaces offered an unique opportunity to obtain a state-of-the-art perspective of virtual reality technologies and advanced man-machine interfaces. Over 40 papers were presented in technical and poster sessions, including three keynote presentations and one topical panel. Key aspects and latest developments of virtual reality and virtual environments, virtual prototyping, advanced modelling and simulation, user interfaces, telerobotics and telepresence along with numerous interesting applications.

As part of the event and the IMEKO World Congress there was also a special exhibition on Virtual Reality offering demonstrations and giving a good view of commercial VR-products, available services and interesting research results in the field.

International CD Symposium´97

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György Striker Award (GSA) for a junior university staff member

The György Striker Award 1997, worth USD 1.000, was given on 5 June for a young Japanese scientist. The name of the person was published during the Closing Ceremony.

See you in Osaka, Japan June 13 - 18, 1999!

The XV IMEKO World Congress will be held in Osaka, Japan on 13 - 18 June 1999. The theme of the congress is "Measurement to Improve the Quality of Life

One of the most popular happenigs was the barbeque on the Viikinsaari Island. The Champions of Kyykkä game were Jun Imai (11 points), A. G. Polak (10), Mr. Chellali (10) and L. Volfová (10) .

Notice!

The Post office will be open in Tampere Hall today on Thursday 5 June 09.00 - 14.00 for mailing your material. You can buy mailing material from the Secretariat.

IMEKO XV World Congress June 13 - 18, 1999 in Japan

The fifteenth World Congress of IMEKO will be held in Osaka, Japan.

The Congress will cover all the areas of the 17 TCs of IMEKO by the presentation of both oral and poster sessions. Keynote speeches and round table discussions are also planned. Technical visits, exhibitions of instruments and social programmes for accompanying persons will be organized.

Submission of Extended Abstracts (together with application form) by June 30, 1998.

IMEKO Congress News

Volume 1, Issue 5 *09 December 1997*

Participants of XIV IMEKO World Congress

Australia	4
Austria	12
Belgium	9
Brazil	7
Canada	12
Chile	1
China	5
Croatia	8
Czech Republic	26
Denmark	5
Egypt	3
Estonia	5
Finland	183
France	28
Georgia	1
Germany	71
Hungary	6
Iceland	1
India	1
Ireland	2
Italy	82
Japan	99
Kenya	2
Korea Republic	12
Lithuania	7
Macedonia	2
Malaysia	2
Mexico	3
Netherlands	7
Norway	5
Poland	56
Portugal	7
Republic of Korea	2
Romania	7
Russia	34
Singapore	1
Slovakia	6
Slovenia	14
South Africa	1
Spain	11
Sweden	35
Switzerland	4
Turkey	11
Ukraine	20
United Kingdom	22
USA	23
Yogoslavia	3

Conclusions, awards and new officers

Visionary panel made conclusions of the congress. It was held on Thursday 5th June just before Closing Ceremony. During the Closing Session were given the Report of Organiser, Distinguished Service Awards and György Striker Award, and published the names of new officers.

The flags of 47 nations were flutterin in front of Tampere Hall.

Visionary panel consisted of members of technical committees, which had done their conclusions for the future.

TC1: D. Hofmann
TC3: M. Peters
TC4: M. Savino
TC5: G. Barbato
TC7: L. van Biesen
TC8: S. D'Emilio
TC10: I. Hanheide
TC11: E. Seiler
TC14: Sh. Ozono
TC15: A. Freddi
TC16: N.D. Samaan
TC17: S. Tachi

All others were Chairmen of TC except M. Savino (TC4) and I. Hanheide (TC10).

Here are a few opinions concerning the World Congress:

- My own view was that IMEKO will develop its nature as a global network connecting scientists and engineers, said Prof. Olli Aumala.

Paavo Uronen (chairman of the IPC) suggested that IMEKO should set up a task force for continuing visioning by the well-known Delphi method.

Service Awards

IMEKO Distinguished Service Awards holders this year:
- Prof. A. Bray (Italy) Co-Chairman of Turin Congress, Italian GC delegate, Honorary Member of TC3 and organiser of a TC Conference in Udine 1974
- W. A. Bajek (USA), GC delegate and AB member.
- Prof. E. R. Carson (UK), Chairman of TC13 for many years
- Prof. I. Morishita (Japan), GC delegate, AB and TB member
- Prof. S. Tachi (Japan), Chairman of TC17
- Prof. G. Zingales (Italy), GC delegate, President 1991-1994, Chairman of the AB, Co-Chairman of Turin Congress.

New Officers

New IMEKO Officers are:
- President Dr. K. Iizuka
- Past President Prof. O. Aumala
- President Elect Dr. M. Peters
- Secretary General Dr. T. Kemeny
- Treasurer Prof. P. H. Osanna
- Vice President for organising IMEKO XVI Prof. W. Wehrmann
- Vice President for organising IMEKO XVII Dr. M. Borsic.

The Final Report of the Organiser

Mr. Aimo Pusa, Chairman of the Organising Committee, gave the Report of the Organiser during the Closing Session of the XIV IMEKO World Congress in Tampere Hall on 5 June 1997.

Mr President, Ladies and Gentlemen.

I have the honour to give the final report on behalf of the National Organising Committee. The Board of Chairmen made the qualitative estimation of the scientific level of the congress, which we just heard as the result of the discussions of Visionary panel.

As a measurement specialists we are not satisfied with qualitative result only. We need accurate measurement with the known uncertainty according to ISO/TAG recommendation. Now is the time for such quantitative results of the congress.

The environmental conditions have been acceptable and ordered in a good time. Total number of registered participants was 780 - without accompanying persons - representing 47 countries. Number of the papers published, which are also on the CD-ROM document, is 533. Of those posters presents 113. The number of no-show authors was fairly low.

Aimo Pusa, Chairman of the National Organising Committee.

In intention to guarantee the success of the congress and background daily operation the Organising Committee had a team of 60 persons and in addition to that on behalf of the congress hall they had 15 persons. I have to point out my best thanks to them, lecture room assistants and technical personal.

Work and fun - The Spirit of Tampere Congress.

The congress secretariat headed by Pirjo Venäläinen has operated continuously without rest from morning to late evening. Warmly thanks to them.

Editing and revising the text by 3800 pages was done by a group of students and young scientists conducted by Jouko Halttunen. To all of them I would like to express my sincere thanks.

International Programming Committee has also done remarkable job for the success of the congress by reviewing all papers.

Last but not least I would like to express my humble thanks to all of you - the participants of the congress - who made this congress successful scientifically and technically.

I have also felt the good spirit on being together.

Ladies and Gentlemen, I have a vision that this might be a fruitful starting point for the organising work of Osaka congress.

György Striker Award (GSA) to Yasuhiro Takaya

The György Striker Award 1997, worth USD 1.000, was given on 5 June to a young Japanese scientist Yasuhiro Takaya. Mr. Takaya is working for Osaka University, Faculty of Engineering.

IMEKO World Congresses 1999, 2000 and 2003

The XV World Congress of IMEKO will be held in **Osaka, Japan on June 13 -18, 1999.** (You will find the Internet WWW pages on **http://imeko99.mecha.osakafu-u.ac.jp**)

The Congress will cover all the areas of the 17 TCs of IMEKO by the presentation of both oral and poster sessions. Keynote speeches and round table discussions are also planned. Technical visits, exhibitions of instruments and social programmes for accompanying persons will be organized.

The XVI World Congress will be held in **Wien, Austria, on September 25 - 28 in the year 2000**.

The XVII IMEKO World Congress will take place in **Dubrovnik, Croatia in the year 2003.**

Web addresses

Finnish Society of Automation	www.automaatioseura.fi
IMEKO International Measurement Confederation	www.imeko.org
IFAC International Federation of automatic Control	www.ifac-control.org
Automation foundation (Automaatiosäätiö)	www.automaatioseura.fi
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VTT / Technical Research Centre of Finland	www.vtt.fi
SIMS, Scandinavian Simulation Society	www.scansims.org
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The International Measurement Confederation (IMEKO) founded in 1958. Organizational activities on automation field in Finland begun already in 1953. Since then tens of members of Finnish Society of Automation have been working for IMEKO on all organization levels. Besides IMEKO, Finnish specialists of automation are active in other international federations and societies, too. Our universities, research centres and enterprises have good and living contacts and co-operational projects all over the world.

In Finland there are long traditions, practice and know how on arrangements of national and international conferences, meetings and exhibitions. Our own Automation Days is one of the biggest educational conference and trade show on automation branch in the Nordic Countries, but in Finland has been successfully held also larger international events like IFAC World Congress in 1978 and IMEKO World Congress in 1997.

The 50th Anniversary celebration of IMEKO had very high ranking in Finland. This book is only a short review of IMEKO activities in Finland. It will introduce some well known IMEKO seniors from Finland, too. We will develop and increase the importance of IMEKO also in the future.

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