



**Procedure for the selection of a CIML President  
and of a CIML First Vice-President**

**1 Extracts from the OIML Convention**

*Article XV*

*The Committee shall select from among its Members a President, and a first and a second Vice-President who shall be elected for a period of six years and shall be eligible for re-election. However, should their mandate expire in the interval between two sessions, it shall automatically be extended until the second of these sessions.*

[...]

*Article XVII*

[...]

*Decisions shall be valid only if the number of those present and represented be at least three-quarters of the number of persons designated as Members of the Committee and should they be supported by a minimum of four-fifths of the votes cast. The number of votes cast shall be at least four-fifths of the number of those present and represented at the session.*

*Abstentions, blank and null votes shall not be considered as votes cast.*

[...]

**2 Declaration of candidacies**

One candidacy for the CIML Presidency has been notified to the CIML Acting President and to the Director of the Bureau: Mr. Alan Johnston, CIML Member for Canada. The accompanying documents (CVs, platforms) are attached to this document sent to the CIML Members for consideration for the election at the 39<sup>th</sup> CIML Meeting in Berlin.

Two candidacies for the CIML First Vice-Presidency have been notified to the CIML Acting President and to the Director of the Bureau: Mr. Charles Ehrlich, CIML Member for USA, and Mrs. Ani Todorova, CIML Member for Bulgaria. The CVs of these two candidates are attached to this document sent to the CIML Members for consideration for the election at the 39<sup>th</sup> CIML Meeting in Berlin.

**3 Procedure for the selection**

The CIML will elect a President, and then a First Vice-President. The procedures for these two elections will be the following.

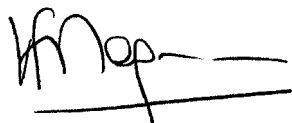
The election is carried out by secret ballot, as follows:

- on each round of the election, the candidate who obtained the lowest number of votes is eliminated,
- when only one candidate remains, his or her candidacy must be approved according to the majority rules defined at Article XVII of the Convention.

If this majority is not reached, then no valid decision is deemed to have been taken by the Committee, and the CIML Presidency or Vice-Presidency remains vacant. In the case of the CIML Presidency remaining vacant, according to Article XV of the Convention, the duties of the President shall be assumed by the First Vice-President until the next CIML Meeting.

#### **4 Transition periods**

The elected President will take up his duties at the 40th CIML Meeting in 2005. The Acting President will pass the CIML Presidency over to the newly elected President at the opening of the 40th CIML Meeting. The term of the elected President will be six years and will end at the opening of the 46th CIML Meeting in 2011. The next election of a President will be organized at the 45th CIML Meeting in 2010 in order to allow the same transition period.

A handwritten signature in black ink, appearing to read 'J.F. Magaña', with a horizontal line underneath it.

J.F. Magaña  
BIML Director

**Att.:** CV of Mr. A. Johnston  
Priorities proposed by Mr. A. Johnston

CV of Dr. C. Ehrlich  
CV of Dr. A. Todorova

## **ALAN E. JOHNSTON**

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Ottawa, Ontario  
K1B 4V3

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Work Telephone Number: 1-613-952-0655  
Electronic Mail Address: johnston.alan@ic.gc.ca

### **ACADEMIC QUALIFICATIONS AND ACHIEVEMENTS**

Business Administration Diploma  
Algonquin College  
Ottawa, Ontario  
1971

### **LANGUAGES**

Bilingual - English/French

### **EXPERIENCE**

#### **President, Measurement Canada**

Operations Sector  
Industry Canada  
April 1994 to Present

Accountable for maintaining the integrity of the Canadian legal measurement system for use in industry and commerce according to statutory authority and requirements set out in the *Electricity and Gas Inspection Act* and the *Weights and Measures Act*.

- Responsibility for a budget of \$24,000,000 and almost 330 employees located across Canada.
- Represents Canada on the Organisation Internationale de Métrologie Légale (OIML) and the Asia-Pacific Legal Metrology Forum (APLMF).
- Member of the OIML Presidential Council since 2001.

**Director General, Executive and Program Services**

Bureau of Consumer Affairs  
Industry Canada  
January 1992 to March 1994

Accountable for the development and management of a business environment conducive to the growth and delivery of consumer programs and the delivery of information technology services.

- Managing budgets totalling approximately \$8 million and recommending the allocation of a Bureau financial portfolio of \$60 million.
- Managing the design, implementation and operations of Bureau financial, procurement and administrative systems and procedures.

**Director, Management Services**

Bureau of Consumer Affairs  
Consumer and Corporate Affairs Canada  
January 1986 to December 1991

Accountable for directing the provision of financial, administrative, personnel and planning services to the Bureau of Consumer Affairs and for the management of the departmental fleet.

From 1971 to 1986, I held a number of positions, with increasing responsibilities, leading to my appointment as Director of Management Services in 1986.

## **ALAN E. JOHNSTON**

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### **ÉTUDES ET RÉALISATIONS**

Diplôme en administration des affaires  
Collège Algonquin  
Ottawa (Ontario)  
1971

### **COMPÉTENCES LINGUISTIQUES**

Bilingue - anglais/français

### **EXPÉRIENCES DE TRAVAIL**

#### **Président, Mesures Canada**

Secteur des opérations  
Industrie Canada  
D'avril 1994 à ce jour

Responsable du maintien de l'intégrité du système canadien de métrologie légale destiné à être utilisé dans l'industrie et le commerce conformément aux textes législatifs et aux exigences énoncées dans la *Loi sur l'inspection de l'électricité et du gaz* et dans la *Loi sur les poids et mesures*.

- Responsable d'un budget de 24 000 000 \$ et d'environ 330 employés situés aux quatre coins du Canada.
- Représentant du Canada au sein de l'Organisation internationale de métrologie légale (OIML) et du Forum Asie-Pacifique de métrologie légale (APLMF).
- Membre du conseil de la présidence de l'OIML depuis 2001.

**Directeur général, Services liés aux programmes et au soutien de la direction**

Bureau de la consommation

Industrie Canada

De janvier 1992 à mars 1994

Responsable de l'élaboration et de la gestion d'un environnement commercial favorisant la croissance et la prestation de programmes relatifs à la consommation et la prestation de services en matière de technologie de l'information.

- Gestion de budgets s'élevant à environ 8 millions de dollars et formulation de recommandations quant à la répartition d'un portefeuille financier du Bureau de 60 millions de dollars.
- Gestion de la conception et de la mise en oeuvre des procédures et des systèmes relatifs aux finances, à l'approvisionnement et à l'administration.

**Directeur, Services de gestion**

Bureau de la consommation

Consommation et Affaires commerciales Canada

De janvier 1986 à décembre 1991

Responsable de la gestion des services en matière de finances, d'administration, de personnel et de planification au Bureau de la consommation et du parc automobile du Ministère.

De 1971 à 1986, j'ai occupé plusieurs postes, avec de plus en plus de responsabilités, menant à ma nomination en tant que Directeur des services de gestion en 1986.

## **ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE - PRIORITIES**

As a candidate for the position of the President of the Organisation Internationale de Métrologie Légale (OIML), I have been asked to provide you with my views on the priorities and future of OIML.

Before I begin to expand on these challenges, you might be asking yourself why I have decided to seek the position. The simple answer is that I have and continue to be interested/concerned (and sometimes vocal) about the future of OIML and I felt it was time to “step up” and assume a more active role in this regard.

### **QUALIFICATIONS:**

And what are my qualifications for the position. Briefly, I have represented Canada as the CIML member for 10 years and as a member of the Presidential Council since 2001. I am the head of the Canadian federal agency responsible for legal metrology, charged with the administration of the *Weights and Measures Act* and *Electricity and Gas Inspection Act*. Prior to my appointment to my present position in 1994, I held a series of positions primarily focussed on management services such as financial management and human resources. If elected President of OIML, I will bring to the position the necessary leadership and a solid understanding of current management and financial practices.

In preparing this document, I reviewed the OIML Action Plan, the report from the “What Will Legal Metrology Be in the Year 2020” Saint-Jean-de-Luz seminar, the Knut Birkeland report, as well as other pertinent documents, and I came to the conclusion that OIML must continually review its role and responsibilities to ensure the organization remains relevant in the future.

So let me begin by stating the environment facing legal metrology organizations today and then I will then address certain critical issues facing OIML.

### **ENVIRONMENT:**

- Period of great change and challenge for legal metrology organizations.
- Businesses and consumers are demanding the removal of trade barriers, which impede their access to new technology.
- A global economy in which virtually no activity in any country can be isolated from the influence and competition from the rest of the world.
- Countries are increasingly adopting standards and model laws developed by international organizations such as OIML as the basis for domestic requirements.
- The number of industrial sectors where measurement forms the basis of the financial transaction continues to grow while most government legal metrology resources are shrinking.
- Governments are increasingly looking for partnerships with other governments or the private sector to ensure the integrity and accuracy of measurement.

This environment naturally leads to the critical issues which I will address in a summary way.

## **ISSUES:**

### **Long Term Strategic Plan**

The CIML and BIML have done an excellent job of identifying a long-term strategic plan for OIML, as well as a series of action plans related to the long term plan. One of the keys to our continued success will be to ensure that the actions taken in relation to the long term plan are adequately resourced and regularly reviewed to ensure they continue to achieve the expected results.

By way of an example is the Development Council. It was decided that a new direction was required for the Council and the necessary changes were made with a view to strengthening legal metrology in developing countries.

We also need to look carefully at the demands being placed on our resources to ensure that our ability to respond to new areas of legal metrology is not compromised and, as increasing membership fees to meet these demands would be an unpopular and difficult decision, we need to continually review our present priorities and workload with a view to potentially reallocating these scarce resources to work for a higher priority. At the same time we need to fully understand the resource ramifications of a decision to take on new legal metrology work.

### **Implementation of the Mutual Acceptance Arrangement (MAA)**

With the MAA receiving approval at the CIML meeting in Kyoto, I anticipate there will be a number of implementation issues which will need “care and attention” and it will be the role of the President to seek solutions to these issues. The hiring of an additional OIML employee to administer the MAA goes a long way to ensuring that the MAA will receive the attention it deserves.

At the same time, this decision creates a financial obligation for OIML and the CIML will have to remain actively involved in this project, if we hope to achieve the anticipated revenue from the MAA to keep it cost neutral.

### **Acceleration of the Work of the Technical Committees**

While we have discussed this issue a number of times, it remains a concern. The essence of OIML is to develop international legal metrology recommendations to be adopted worldwide. But, in today’s global economy, technological advancements in measuring instruments are being introduced more rapidly than legal metrology officials’ capacity to develop approval and inspection procedures.

Changing political landscapes, such as the European Union, are also putting pressure on OIML to deliver timely Recommendations. If OIML cannot accelerate its review of Recommendations, other regional organizations will step in to fill the void, threatening the role of



OIML. We must find a way to accelerate the development of timely Recommendations to keep pace with the rapid advancement of technology.

### **Closer Liaison with Other Metrology Organizations**

At the same time, we need to continue the important work undertaken by our former President, Gerard Faber, to develop closer working relationships with other internationally recognized standards organizations, keeping in mind that this does not mean that OIML should relinquish any of its authority. To ensure that we develop quality Recommendations in the most timely and efficient method possible we need to recognize that, in an era of shrinking resources, collaborations and partnerships should be encouraged.

In conclusion, thank you for taking the time to review this brief document. I have not attempted to address all of the priorities facing OIML but I look forward to the Conference in Berlin where we will have an opportunity to discuss/debate these and other issues. And, if elected President, I assure you that I will make that extra effort to ensure the continued success of OIML.

Alan E. Johnston  
President  
Measurement Canada  
Industry Canada

2004-08-23

## **ORGANISATION INTERNATIONALE DE MÉTROLOGIE LÉGALE - PRIORITÉS**

À titre de candidat pour le poste de président de l'Organisation internationale de métrologie légale (OIML), j'ai été invité à vous communiquer ma position sur les priorités et l'avenir de l'OIML.

Avant de me lancer dans l'explication des défis qui me motivent, je vous dirais que j'ai décidé de postuler pour le poste tout simplement parce que j'ai depuis toujours les intérêts de l'OIML à cœur et que son avenir me passionne. Je crois que le temps est venu pour moi d'agir et d'assumer un rôle plus actif au sein de l'organisation.

### **COMPÉTENCES :**

Mes compétences pour le poste - j'ai représenté le Canada à titre de membre du CIML pendant 10 ans et je siège au Conseil de la présidence depuis 2001. Je dirige un organisme fédéral responsable de la métrologie légale au Canada qui est chargé d'appliquer la *Loi sur les poids et mesures* et la *Loi sur l'inspection de l'électricité et du gaz*. Avant ma nomination à la présidence de Mesures Canada en 1994, j'ai occupé une série de postes principalement axés sur la gestion de services financiers et de ressources humaines. Si je suis élu président de l'OIML, je m'engage à faire preuve de leadership et à mettre à profit mes connaissances approfondies des pratiques contemporaines en finances et en gestion.

Lors de la préparation du présent exposé, je me suis plongé dans la lecture du Plan d'action de l'OIML, du rapport «What will legal metrology be in the year 2020 » découlant du séminaire de Saint-Jean-de-Luz, du rapport de Knut Birkeland et dans d'autres documents pertinents et j'en ai conclu que l'OIML doit revoir en continu son rôle et ses responsabilités pour assurer sa survie à l'avenir.

Je vais d'abord décrire le contexte dans lequel doivent évoluer les organisations métrologiques aujourd'hui avant d'énoncer certains des principaux enjeux auxquels sera confrontée l'OIML.

### **CONTEXTE :**

- Période de grand changement et de défi pour les organisations de métrologie légale.
- Les entreprises et les consommateurs exigent l'abolition des barrières commerciales qui nuisent à l'accès à la nouvelle technologie.
- Un contexte d'économie globale où les activités de tous les pays sont presque invariablement assujetties à l'influence et à la compétition des autres pays.
- Les pays adoptent de plus en plus des normes et des lois types élaborées par des organisations internationales telles l'OIML comme fondement de leurs exigences nationales.
- Le nombre de secteurs industriels où la mesure constitue la base des transactions financières

continue d'augmenter alors que les ressources en métrologie légale de la majorité des gouvernements ne cessent de diminuer.

Les gouvernements se doivent d'établir des partenariats avec les autres administrations publiques ou le secteur privé pour assurer l'intégrité et l'exactitude des mesures.

Ce contexte sert de toile de fond aux principaux enjeux que je vais soulever de façon succincte.

## **ENJEUX :**

### **Plan stratégique à long terme**

Le CIML et le BIML ont réussi avec brio à établir un plan stratégique à long terme pour l'OIML ainsi qu'une série de plans d'action associés au plan à long terme. Pour assurer le succès continu de l'organisation, il faudra voir à ce que les actions mises en oeuvre dans le cadre du plan à long terme reçoivent les ressources adéquates et qu'elles soient examinées de façon régulière afin de vérifier qu'elles produisent les résultats escomptés. Le Conseil de développement est un bon exemple. Après avoir décidé que le Conseil devait faire l'objet d'une nouvelle orientation, les changements nécessaires ont été apportés en vue de consolider la métrologie légale dans les pays en développement.

Nous devons également prêter une attention particulière aux exigences sollicitant nos ressources afin de ne pas compromettre notre capacité à répondre aux nouveaux domaines de métrologie légale, évitant ainsi de prendre la décision difficile et peu populaire d'augmenter les frais d'adhésion des membres pour pouvoir satisfaire ces exigences. Il nous incombe aussi d'examiner de façon continue nos priorités actuelles et notre charge de travail afin de réaffecter au besoin les ressources limitées à des activités de plus grande priorité, tout en prenant soin de bien évaluer les répercussions de toute décision visant à accepter de nouveaux projets en métrologie légale.

### **Mise en oeuvre d'un arrangement d'acceptation mutuelle (AAM)**

À la lumière de l'approbation de l'AAM lors de la réunion du CIML à Kyoto, je crois qu'il y aura un certain nombre de problèmes de mise en oeuvre qui devront être traités avec « précaution et doigté » et il appartient au président de trouver des solutions à ces problèmes. L'embauche d'un autre employé à l'OIML pour administrer l'AAM est une façon indéniable de s'assurer que l'AAM fera l'objet de l'attention requise. Toutefois, une telle décision entraîne une obligation financière pour l'OIML et il importe que le CIML demeure très actif dans ce projet si nous espérons recevoir les retombées économiques escomptées de l'AAM pour équilibrer les coûts.

### **Accélération des travaux des comités techniques**

Même si ce sujet a été débattu à maintes reprises, il n'en demeure pas moins une source de préoccupation. La raison-d'être de l'OIML est d'élaborer des recommandations internationales en métrologie légale devant être adoptées à l'échelle mondiale. Dans le contexte d'économie mondiale d'aujourd'hui, les progrès technologiques visant les instruments de mesure déferlent à un rythme

plus rapide que la capacité des agents de métrologie légale à élaborer des méthodes d'approbation et d'inspection.

Des changements d'ordre politique, comme l'Union européenne, forcent l'OIML à produire plus rapidement des Recommandations. Si l'OIML est incapable d'accélérer son processus de revue des Recommandations, d'autres organisations régionales prendront la relève afin de combler ce besoin, mettant en péril le rôle de l'OIML. Nous devons trouver un moyen d'élaborer rapidement et à temps les Recommandations afin de nous adapter à la cadence rapide des progrès technologiques.

### **Liaison plus étroite avec d'autres organisations métrologiques**

Nous devons également poursuivre les travaux importants entrepris par le président sortant, Gérard Faber, afin de tisser des liaisons de travail plus étroites avec d'autres organisations de normalisation internationales reconnues, sans pour autant que l'OIML ne concède aucun de ses pouvoirs. Pour élaborer avec le plus d'efficacité et de rapidité possibles des Recommandations de qualité, nous devons reconnaître que, compte tenu de nos ressources très limitées, la collaboration et le partenariat sont les solutions de l'avenir.

Je termine en vous remerciant d'avoir pris le temps de lire mon bref exposé. Je n'ai pas énuméré toutes les priorités auxquelles doit s'attaquer l'OIML, mais j'ai hâte d'examiner et de discuter des enjeux qui nous préoccupent lors de la Conférence de Berlin. Si je suis élu président, je ne ménagerai aucun effort pour assurer le succès continu de l'OIML.

Alan E. Johnston  
Président  
Mesures Canada  
Industrie Canada

# Curriculum Vitae

**Dr. Charles David Ehrlich**

**Born:** September 10, 1951 (Miami)  
**Married:** June 2, 1974 (Susan Morris)  
**Two Children:** Rebecca (24), Gabriel (22)

## 1973

Bachelors Degree (Physics major, Math minor)  
University of Miami (Miami, Florida)

## 1979

Ph.D. (Solid State Surface Physics)  
University of Pennsylvania (Philadelphia)  
Thesis: "A Measurement of the Absolute Tunneling Current Density in Field Emission from Tungsten 110"

## 2000 – present:

- Serve as Leader of the NIST International Legal Metrology Group.
- Serve on behalf of U.S. State Department as the Member to the International Committee of Legal Metrology (CIML).
- Participate in meetings and interact with the Board of Directors of the National Conference on Weights and Measures (NCWM) to promote harmonization of U.S. legal metrology standards and OIML International Recommendations.

## 1996 – 1999:

- First served as Deputy Chief, and then as Chief, of the NIST Technical Standards Activities Program. Activities included managing projects of the International Organization of Legal Metrology (OIML), International Organization for Standardization (ISO) and the U.S. National Technology Transfer and Advancement Act (NTTAA, aimed at incorporating consensus standards into U.S. federal regulations).
- Participated in development of the US-EU Framework on "Metrology in Support of Trade", which set out the policy basis and orientation for a joint technical program of work between the United States and the European Community in view of supporting and furthering mutual recognition of test, calibration, and measurement certificates/reports that are provided for regulatory and market place compliance purposes.
- Participated extensively in OIML work in the areas of water meters, hardness and sphygmomanometers.
- Serve as a technical auditor for the NIST National Voluntary Laboratory Accreditation Program (NVLAP).

**1994 - 1996:**

- Served in the Office of the NIST Director as a Program Analyst, covering the Chemical Science and Technology Laboratory (CSTL), the Advanced Technology Program (ATP) and other areas. Selected to serve a second year as the Senior Program Analyst.

**1987 - 1994:**

- Served as Leader of the NIST Pressure Group. Responsible for the U.S. National Standards for pressure from 0.05 to 5000 times atmospheric pressure. Responsible for managing an annual budget of \$1.5 million, which included base funding for metrological research, other federal-agency funding to support various research projects, and funding related to the operation of NIST pressure calibration services.
- Also served as Co-Chairman of the National Conference of Standards Laboratories (NCSL) Working Group on Deadweight Pressure Gauges (until 1998), which developed an NCSL Recommended Practice on determining Deadweight Pressure Gauge calibration uncertainties.
- Began working on OIML projects, in particular on Recommendations in the pressure area.

**1984 - 1987:**

- Joined the Vacuum Group of the National Bureau of Standards to establish a Gas Leak Standards Calibration Service (received U.S. Department of Commerce Bronze Medal for this work).

**1979 - 1984:**

- Worked in industry for Varian Associates in their Semiconductor Equipment Group doing R&D on ion implantation systems; during the last year at Varian, was the R&D Manager for Batch Process Product Development.

**Publications/Talks**

- Author or coauthor of more than 45 technical, peer-reviewed publications, and delivered 60 invited or contributed presentations. (See accompanying lists in Annexes).

**Committee Memberships**

- Member of the International Bureau of Weights and Measures' (BIPM's) Joint Committee on Guides for Metrology (JCGM) and its two Working Groups: Working Group 1 that is responsible for the Guide to the Expression of Uncertainty in Measurement (GUM), and Working Group 2 that is responsible for the International Vocabulary of Basic and General Terms in Metrology (VIM). Chair Task Groups in both Working Groups.
- Served from 1999 to 2001 on the Executive Standards Council (ExSC) of the American National Standards Institute (ANSI), which is responsible for the maintenance and revision of the "ANSI Procedures for the Development and Coordination of American National Standards"; this publication governs the U.S. consensus development process.
- Serve as Chairman of the Working Group on "Mutual Recognition Arrangements" of the Asia-Pacific Legal Metrology Forum (APLMF).
- Coordinated and facilitated the first-ever Workshop on Legal Metrology for the Americas (WLMA) that led to the creation of the Sistema Interamericano de Metrologia (SIM) Legal Metrology Working Group (LMWG), the Regional Legal Metrology Organization (RLMO)

of the Americas. Serve as Co-Chairman of the Working Group on “Metrological Control of Measuring Instruments” of the SIM LMWG.

- Represent ANSI and serve as Co-Chairman of ISO Technical Advisory Group 4 (TAG4) on Metrology.
- Member of the American Physical Society (APS), American Vacuum Society (AVS), and American Society for Testing and Materials (ASTM).
- Serve as President of the NIST Chapter of Sigma Xi (Science Honor Society).

### **Awards**

- Recipient of the Department of Commerce Bronze Medal Award (1992) for “outstanding contributions and leadership in establishing the nation’s first leak-rate measurement standards and calibration services.”
- Recipient (with Stanley D. Rasberry) of the 1997 Best Paper Award (Management Category) of the National Conference of Standards Laboratories (NCSL) for the paper “Metrological Timelines in Traceability”.
- Recipient of the 1999 Andrew J. Woodington Award for Professionalism in Metrology from the Board of Directors of the Measurement Science Conference.

## Annex A

### Charles David Ehrlich

#### PUBLICATIONS

1. C. Ehrlich and H. Oppermann, "Issues and Trends in Legal Metrology", OIML Bulletin, Volume XLIV, Number 1, January 2003, p.10.
2. C.D. Ehrlich and J.W. Schmidt, IUPAC Experimental Thermodynamics, Section 3.2 on "Piston Gauges" in a Chapter on Pressure (3) for Experimental Thermodynamics Vol. 6: Measurement of the thermodynamics properties of single phases (2003; printing in progress).
3. Abbott, P. and Ehrlich, C., "Leak Testing", "Handbook of Reference Data for Nondestructive Testing", Leonard Mordfin, Editor, ASTM International, ASTM Data Series: DS 68, February, 2002, pp. 149-165.
4. K.-D. Sommer, C.D. Ehrlich and M. Kochsiek, "Concept of Measurement Uncertainty in Deciding Conformance in Legal Metrology", Proceedings of the National Conference of Standards Laboratories, August 2001
5. Pettit, R.B., Jaeger, K. and Ehrlich, C.D., "Issues in Purchasing and Maintaining Intrinsic Standards", Cal Lab Magazine (November-December, 2000), p.26.
6. Schmidt, J.W., Cen, Y., Driver, R.G., Bowers, W.J., Houck, J.C., Tison, S.A. and Ehrlich, C.D., "A Primary Pressure Standard at 100 kPa", Metrologia, 36, Number 6, 1999, pp. 525-530.
7. Schmidt, J.W., Tison, S.A., and Ehrlich, C.D., "A Model for Drag Forces in the Crevice of Piston Gages in the Viscous and Molecular Flow Regimes", Metrologia, 36, Number 6, 1999, pp. 565-570.
8. Delajoud, P., Girard, M. and Ehrlich, C., "Early History of the Development and Characterization of a 50 mm Diameter, Gas-Operated Piston Gauge as a Primary Pressure Standard", Metrologia, 36, Number 6, 1999, pp. 521-524.
9. Perkin, M., Kohler, R., Skrovanek, T., Morris, E.C., Tilford, C.R., Ehrlich, C.D., Ooiwa, A., Eichorn, G., Jager, J., Molinar, G.F., Bass, A.H., and Gupta, A.C., "A Comparison of Pressure Standards in the Range 10 kPa to 140 kPa", Metrologia, 35, 1998, pp. 161-173.
10. Ehrlich, C.D. and Baker, L.H. (Co-Chairmen), "NCSL Intrinsic/Derived Standards Practice on Deadweight Pressure Gauges", 124 pages, (July 1998)
11. Ehrlich, C.D. and Rasberry, S.D., "Metrological timelines in traceability", OIML Bulletin, 39 , No. 3, July 1998, pp. 16-28.
12. Ehrlich, C.D. and Rasberry, S.D., "Metrological timelines in traceability", Metrologia, 34 , No. 6, 1997, pp. 503-514.
13. Ehrlich, C.D. and Rasberry, S.D., "Metrological timelines in traceability", Journal of Research of the National Institute of Standards and Technology, Vol. 103, Number 1, (January-February 1998), pp. 93-105.
14. Ehrlich, C.D. and Rasberry, S.D., "Metrological timelines in traceability", Proceedings of the National Conference of Standards Laboratories, (July 1997), p. 889.
15. Ehrlich, C.D. and Rasberry, S.D., "Metrological timelines in traceability", Proceedings of the Measurement Science Conference, (January 1997)
16. Mulholland, G., Fassett, J., and Ehrlich, C. (Editors), "A Working Conference on Global Growth of Technology: Is America Prepared?", NIST Special Publication 897, June, 1996.



17. "A Look at Uncertainties over Twenty Decades of Pressure Measurement", C.D. Ehrlich, INVITED, Proceedings of the XIII IMEKO World Congress (September 1994), 1941-1950.
18. "An Intercomparison of Pressure Standards in the Hydraulic Pressure Region up to 28 MPa between NPL (India) and NIST (USA)", J.K.N. Sharma, Kamlesh K. Jain, C.D. Ehrlich, published in NIST Journal of Research (Sept./Oct. 1994)
19. "Investigation of Annular Forces Using an Oscillating, Gas-Operated Piston Gauge", T. Lettieri, J. Kelley and C. Ehrlich, High Pressure Science and Technology - 1993, AIRAPT/APS Conference Proceedings 309 Part 2 (1994) 1605-1608.
20. "Elastic Distortions of a Multi-Mode Piston-Cylinder Unit up to 28 MPa", G.F. Molinar, C. Ehrlich, J. Houck and P.C. Cresto, High Pressure Science and Technology - 1993, AIRAPT/APS Conference Proceedings 309 Part 2 (1994) 1589-1592.
21. "Gas and Mode, Vertical and Rotational Effects with a Three Piston Gauge Apparatus", J.W. Schmidt, B.E. Welch and C.D. Ehrlich, Metrologia, 30, No. 6, (1993/94) 599-602.
22. "Elastic Distortion Calculations on a Special Piston Gauge (PG27) up to 28 MPa in Different Operational Modes", G.F. Molinar, P.C. Cresto, C. Ehrlich and J. Houck, Metrologia, 30, No. 6, (1993/94) 635-640.
23. "A Review of the State of the Art in Gas-Operated Piston Gages", C.D. Ehrlich, INVITED, Metrologia, 30, No. 6, (1994/94) 585-590.
24. "Operational Mode and Gas Species Effects on Rotational Drag in Pneumatic Dead Weight Pressure Gages," J.W. Schmidt, B.E. Welch and C.D. Ehrlich, Meas. Sci. Technol. 4 (1993) 26-34.
25. "Intercomparison of the Effective Areas of a Pneumatic Piston Gage Determined by Different Techniques," K. Jain, C. Ehrlich, J. Houck and J.K.N. Sharma, Meas. Sci. Technol. 4 (1993) 249-257.
26. "High Pressure Measurement at NIST and Cooperative Activities between NIST and IMGC", C.D. Ehrlich, INVITED, Conference Proceedings of the Italy/USA Bilateral Meeting, May 1992.
27. "High Pressure Gas Calibration at NIST", S.W. Doty and C.D. Ehrlich, Proceedings of the 1992 Navy Metrology Research and Development Requirements Conference, Annapolis, Maryland (1992)
28. "Intercomparison of Hydraulic Pressure Measurements to 28 MPa using a Single Piston Gage in the Controlled-Clearance, Reentrant and Simple Configurations", K. Jain, C. Ehrlich and J. Houck, Review of Scientific Instruments, 63, 3127, (1992)
29. "NIST Measurement Services: NIST Leak Calibration Service," C.D. Ehrlich and S.A. Tison, NIST Special Publication SP250-38, January 1992.
30. "Recommended Practices for the Calibration and Use of Leaks," C.D. Ehrlich and J.A. Basford, CRITICAL REVIEW, Journal of Vacuum Science and Technology A, 10, No. 1, p. 1 (Jan/Feb 1992)
31. "An Approach to the Use of Controlled-Clearance Piston Gages in Different Modes," K. Jain, C. Ehrlich and J. Houck, XIII AIRAPT International Conference on High Pressure Science and Technology: Proceedings, 7-11 October, 1991 (Oxford & IBH Publishing Company, New Delhi, 1992), p.846.
32. "A Comparative Study of Pneumatic Pressure Measurement to 0.4 MPa by Different Primary Methods," K. Jain, C. Ehrlich, J. Houck, B. Welch and J.K.N. Sharma, XIII AIRAPT International Conference on High Pressure Science and Technology: Proceedings, 7-11 October, 1991 (Oxford & IBH Publishing Company, New Delhi, 1992), p.843.

33. "Standard Practice for Calibrating Gaseous Reference Leaks", overhaul of ASTM Standard E908 performed by C. Ehrlich, 1991 Annual Book of ASTM Standards, Section 3, Volume 03.03 (Nondestructive Testing), p. 362 (1991)
34. "A Study of the Linearity of Transfer Leak Standards and a Helium Leak Detector," C.D. Ehrlich, S.A. Tison, H.Y. Hsiao and D.B. Ward, *Journal of Vacuum Science and Technology A*, 8(6), p.4086 (1990)
35. "The Reduction of Uncertainties for Absolute Piston Gage Pressure Measurements in the Atmospheric Pressure Range", B.E. Welch, R.E. Edsinger, V.E., Bean, C.D. Ehrlich, *Journal of Research of the National Institute of Standards and Technology*, 94, p. 343 (1989)
36. "Observations of Gas Species and Mode-of-Operation Effects on Effective Area of Gas-Operated Piston Gages," B.E. Welch, R.E. Edsinger, V.E. Bean, and C.D. Ehrlich, BIPM Monograph 89/1, High Pressure Metrology, Seminar organized by the High Pressure Working Group of the Comité Consultatif pour la Masse et les grandeurs apparentées, LNE Paris (24-25 May 1988), G.F. Molinar, editor, 184 pages (1989), p. 81.
37. "Present Status of the NBS Leak Standards Program - 1988", Charles D. Ehrlich, National Conference of Standards Laboratories 1988 Workshop and Symposium Technical Presentations, p. 9-1, 1988.
38. "Low-Range Flowmeters for Use with Vacuum and Leak Standards," K.E. McCulloh, C.R. Tilford, C.D. Ehrlich, and F.G. Long, Jr., *J. Vac. Sci. Technol. A*, 5, No. 3, p. 376 (1987)
39. "Present Status of the Leak Standards Program at the National Bureau of Standards", Charles Ehrlich, INVITED, *J. Vac. Sci. Technol. A*, 5, No. 1, p. 125 (Jan/Feb 1987)
40. "A Note on Flow Rate and Leak Rate Units," Charles D. Ehrlich, *J. Vac. Sci. Technol. A*, 4, No. 5, 1986, p. 2384.
41. "Transfer Leak Studies and Comparison of Primary Leak Standards at NBS and SNL", Richard Hyland, Charles D. Ehrlich, Charles R. Tilford and Steve Thornberg, *J. Vac. Sci. Technol. A*, 4, No. 3, 1986, p. 334.
42. "Performance Characteristics of the Extron 160 10 Ion Implantation System", R. Liebert, B. Pedersen, C. Ehrlich and W. Callahan, *Nuclear Instruments and Methods*, B6, 1985, p. 16.
43. "A Technique for Optimizing the Dose Uniformity of a Magnetic Scanning High Current Implanter", C.D. Ehrlich, A. Delforge and R. Liebert, *Nuclear Instruments and Methods*, B6, 1985, p. 228.
44. "Applications of Magnetic Scanning to High Current Implantation", P.R. Hanley and C.D. Ehrlich, *IEEE Trans. Nucl. Sci.*, NS 28, No. 2, April 1981, p. 1747.
45. "Addition of an electron multiplier to the Varian movable Faraday cup assembly for measurement of angular resolved photoemission", S. P. Weeks, C.D. Ehrlich and E.W. Plummer, *Rev. Sci. Instrum.*, 48, No. 2, Feb. 1977, p. 190.
46. "Measurement of the Absolute Tunneling Current Density in Field Emission from Tungsten (110)", C.D. Ehrlich and E. W. Plummer, *Phys. Rev. B*, 18, No. 8, Oct. 1978, p. 3767.
47. "Measurement of the Absolute Tunneling Current Density in Field Emission from Tungsten (110)", Charles David Ehrlich, Ph.D. Dissertation, University of Pennsylvania, 1979.

## **Annex B**

### **Charles David Ehrlich**

#### **PRESENTATIONS**

- i. “Update on Revision of the VIM”, National Conference of Standards Laboratories Annual Workshop and Symposium, July 15, 2004, Salt Lake City, Utah.
- ii. “Open Forum on Issues in Traceability”, Plenary panel session coordinator and speaker, National Conference of Standards Laboratories Annual Workshop and Symposium, July 14, 2004, Salt Lake City, Utah.
- iii. “International Legal Metrology and the OIML Mutual Acceptance Arrangement”, Annual Meeting of the Japanese 'Measurement Administration Council', November 4, 2003, Kyoto, Japan.
- iv. “Approaches to Defining and Achieving Metrological Traceability in Legal Metrology”, APLMF Symposium on Traceability in Legal Metrology, October 30, 2003, Kyoto, Japan.1. “Update on Recent Activities of the VIM and GUM Committees” (Co-author W. Tyler Estler), National Conference of Standards Laboratories Annual Workshop and Symposium, August 21, 2003, Tampa, Florida.
2. “What Needs to be Traceable in a Statement of Traceability”, panel session coordinator and speaker, National Conference of Standards Laboratories Annual Workshop and Symposium, August 20, 2003, Tampa, Florida.
3. “Current OIML Opportunities and Their Importance” (Co-author Gilles Vinet), National Conference on Weights and Measures Annual Meeting, July 15, 2003, Sparks, Nevada.
4. “Update on Programs of the NIST Weights and Measures Division”, Annual Meeting of the Scale Manufacturer’s Association, April 25, 2003, Marco Island, Florida.
5. “Issues Concerning the Global Acceptance of Test Results: Development of the OIML Mutual Acceptance Arrangement”, Keynote Speech, Milestones in Metrology Congress, April 2, 2003, Maastricht, The Netherlands.
6. “Issues and Trends in Legal Metrology”, (Co-author Henry Oppermann), OIML Seminar: “What will Legal Metrology be in the Year 2020”, September 27, 2002, Saint-Jean-de-Luz, France.
7. “Overview of NIST Activities in International Legal Metrology”, NIST-Mexico Dialogue, August 21, 2002, Gaithersburg, Maryland.
8. “Issues in Traceability”, panel session coordinator and speaker, National Conference of Standards Laboratories Annual Workshop and Symposium, August 8, 2002, San Diego, California.
9. “Framework for a Mutual Acceptance Arrangement on OIML Type Evaluations”, National Conference of Standards Laboratories Annual Workshop and Symposium, August 6, 2002, San Diego, California.
10. “Issues and Trends in Legal Metrology”, (Co-author Henry Oppermann), National Conference on Weights and Measures Annual Meeting, July 16, 2002, Cincinnati, Ohio.
11. “Introduction to and Overview of the International Organization of Legal Metrology”, Metrology Workshop for the Gulf Cooperation Council (GCC), July 12, 2002, Gaithersburg, Maryland.

12. "Overview of NIST Activities in International Legal Metrology", Standards in Trade Workshop for Korean Agency for Technology and Standards (KATS), July 9, 2002, Gaithersburg, Maryland.
  13. "Framework for a Mutual Acceptance Arrangement on OIML Type Evaluations", 36th CIML Meeting, September, 2001, Moscow, Russia.
  14. "Concept of Measurement Uncertainty in Deciding Conformance in Legal Metrology", (Co-author with K.-D. Sommer, who made presentation, and M. Kochsiek), National Conference of Standards Laboratories Annual Workshop and Symposium, July 31, 2001, Washington, DC.
  15. "Timelines for Demonstrating Traceability in Biological and Environmental Measurements", presented September 22, 2000, at the Eighth International Symposium on Biological and Environmental Reference Materials, Natcher Conference Center, The National Institutes of Health, Bethesda, Maryland.
  16. Early History of the Development and Characterization of a 50 mm Diameter, Gas-Operated Piston Gauge as a Primary Pressure Standard", presented in May, 1999, at the Third International Conference on Pressure Metrology in Torino, Italy.
  17. "Deadweight Pressure Gauges, Developing a RISP for Derived Standards", presented January 29, 1999, at the Measurement Science Conference session on "Current Status of Intrinsic Standards and Recommended Practices".
  18. "The NCSL Intrinsic/Derived Standards Committee's Definition of Intrinsic Standard", presented January 29, 1999, at the Measurement Science Conference session on "Issues in Purchasing and Maintaining Intrinsic Standards".
- Note Served one year (1998) as National Measurement and Standards Needs Assessment Coordinator for the NIST Laboratory Council.
19. "Status of the Deadweight Pressure Gauge RISP", National Conference of Standards Laboratories (NCSL) Workshop and Symposium, Atlanta, GA, August 1997.
  20. "Metrological Timelines in Traceability", (Co-author Stanley Rasberry), National Conference of Standards Laboratories (NCSL) Workshop and Symposium, Atlanta, GA, August, 1997. **WINNER OF BEST PAPER AWARD IN MANAGEMENT CATEGORY.**
  21. "Metrological Timelines in Traceability", National Conference on Weights and Measures State Laboratory Program Meeting, Chicago, IL, July 1997.
  22. "Metrological Timelines in Traceability", A2LA Annual Accreditor's Enclave, Baltimore, MD, June 9, 1997.
  23. "Metrological Timelines in Traceability", Eastern Analytical Symposium, Somerset, NJ, November 1996.
  24. "Meeting Measurement and Standards Needs in the U.S.", presentation to NIST Visiting Committee, Boulder, CO, September, 1996.
  25. "Issues Concerning the Government Performance and Results Act (GPRA) at NIST", presented to ad-hoc Federal Agency Research Roundtable, NIST, May 1996.
  26. "Uncertainties Using Multiple (Piston Gauge) Instruments", (with Keith Eberhardt, NIST Statistical Engineering Division), Measurement Science Conference Symposium and Workshop, Anaheim, CA, January 26-27, 1995.
  27. "A Look at Uncertainties over Twenty Decades of Pressure Measurement", INVITED KEYNOTE TALK, XIII IMEKO World Congress, Torino, Italy, September 7, 1994.
  28. "Status of the Deadweight Pressure Gage RISP", National Conference of Standards Laboratories Workshop and Symposium, Chicago, IL, August 3, 1994.
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Note Began two-year tour of duty in NIST Program Office on June 13, 1994

29. "The NIST NVLAP Program", National Research Laboratory of Metrology, Tsukuba, Japan, March 17, 1994.
30. "Pressure Metrology at NIST", National Institute of Metrology, Beijing, People's Republic of China, March 11, 1994.
31. "High Pressure Metrology at NIST", Shanghai Institute of Metrological Technology, Shanghai, People's Republic of China, March 7, 1994.
32. "An Overview of International Pressure Metrology", Measurement Science Conference Symposium and Workshop, Pasadena, CA, January 27, 1994.
33. "Recent Advances in Pressure Measurement at NIST", National Conference of Standards Laboratories Workshop and Symposium, Albuquerque, NM, July 26, 1993.
34. "Elastic Distortions of a Multi-Mode Piston-Cylinder Unit up to 28 MPa", Poster Session, APS Topical Group on Shock Compression of Condensed Matter and the International Association for the Advancement of High Pressure Science and Technology (AIRAPT) Joint 1993 Meeting, Colorado Springs, CO, July 2, 1993.
35. "A Review of the State of the Art in Gas-Operated Piston Gages", Second Comite Consultatif pour la Masse et les Grandeurs Apparentees (CCM) International Seminar "Pressure Metrology from 1 kPa to 1 GPa", Paris, France, June 2, 1993.
36. "Pressure Measurement Uncertainty and Status of the NCSL Recommended Practices Committee on Deadweight Piston Gauges", Measurement Science Conference Symposium and Workshop, Anaheim, CA, January 28, 1993.
37. "High Pressure Gas Calibration at NIST", presented by S. Doty at 1992 Navy Metrology Research and Development Requirements Conference, Annapolis, MD, June 10, 1992.
38. "High Pressure Measurement at NIST and Cooperative Activities between NIST and IMGC", Italy/USA Bilateral Meeting, Torino, Italy, May 6, 1992.
39. "Pressure Measurement Uncertainty using Deadweight Piston Gages," Measurement Science Conference, Anaheim, CA, January 31, 1992.
40. "Latest Developments in Static Pressure Measurements at NIST," NCSL Region 3 Semi-annual Meeting at NIST, October 24, 1991, Gaithersburg, MD.
41. "Intercomparison of Hydraulic Pressure Measurements to 28 MPa using a Single Piston Gage in the Controlled-Clearance, Reentrant and Simple Configurations," XIII AIRAPT International Conference on High Pressure Science and Technology, October 7, 1991, Bangalore, India.
42. "The Status of Piston Gage Metrology at NIST," seminar at Ceskoslovensky Metrologicky Ustav (CSMU), June 3, 1991, Bratislava, Czechoslovakia.
43. "Legal Metrology (Pertaining to Pressure Measurement) in the U.S.," seminar at Ceskoslovensky Metrologicky Ustav (CSMU), June 3, 1991, Bratislava, Czechoslovakia.
44. "Recent Activities in the NIST Pressure Group," presented as a Division of Mechanical and Optical Metrology Colloquium at the National Physical Laboratory, May 23, 1991, Teddington, England.
45. "Recommended Practices for the Calibration and Use of Leaks," presented by J. Basford at the 37th National Symposium of the American Vacuum Society, October 10, 1990, Toronto, Canada.
46. "Summary of Accomplishments of AVS Recommended Practices Committee on Calibrated Leaks," presented at the Standard Leak Calibration Workshop, NIST, August 23, 1990, Gaithersburg, MD.

47. "Piston Gage Pressure Metrology: Improved Calibration Laboratory Standards and Reduced Uncertainty Values," presented in Session 2C of the 1990 NCSL meeting, August 20, 1990, Washington, D.C.
48. "Overview of the NIST Pressure Group," Thermophysics Division Seminar, NIST, Physics B165, February 12, 1990.
49. "Where does the U.S. Stand in International Pressure Intercomparisons?," presented at Session C5 (Global Metrology in Pressure) of the 1989 NCSL meeting, July 11, 1989, Denver, CO.
50. "Calibration of Leak Artifacts, Leak Rate Units, and Potential Problems in Leak Testing Large Systems"; presented at International Standards Organization ISO/TC85/SC5/WG10 meeting, June 8, 1989, Crystal City Marriott, Alexandria, VA.
51. "Pressure Measurement Accuracy", presented in conjunction with the workshop "Pressure Measurement Accuracy: Instrument Performance and the Calibration Chain" at the National Conference of Standards Laboratories meeting August 17, 1988 in Washington, D.C.
52. "Calibrated Leaks and How to Use Them", 34th National Vacuum Symposium of the American Vacuum Society; November 4, 1987; Anaheim Convention Center, Anaheim, CA.
53. "Helium Permeation Leak Artifacts: A Closer Look", Charles D. Ehrlich, presented Sept. 21, 1987; Standard Leak Calibration Workshop, National Bureau of Standards, Gaithersburg, MD.
54. "Leak Measurement Standards at the National Bureau of Standards", Charles D. Ehrlich and Charles R. Tilford (talk presented by C. Tilford), October 31, 1986; International Workshop on the Leak Detection and Repair of Leaks in Large Vacuum Systems; Baltimore Civic Center, Baltimore, MD.
55. "Performance of Two Types of Constant Pressure Flowmeters at Low Flow Rates", Charles D. Ehrlich, talk presented October 28, 1986, 10th International Vacuum Congress and 33rd National Symposium of the American Vacuum Society; Baltimore Civic Center, Baltimore, MD.
56. "UHV and Leak Metrology: The Research Questions", NBS Surface Science "Lunch Bunch" talk, October 6, 1986; Gaithersburg, MD.
57. "Status of the NBS Leak Standards Program", Annual Fall Conference of the American Society for Nondestructive Testing; October 2, 1986; Fairmont Hotel, New Orleans, LA.
58. "Present Status of the Leak Standards Program at the National Bureau of Standards", Sixth Annual Symposium of the Tennessee Valley Chapter of the American Vacuum Society, Topical Conference on the Calibration and Application of Mass Spectrometers and Calibrated Leaks; April 29, 1986; Garden Plaza Hotel, Oak Ridge, TN.
59. "Low Range Flowmeters for Use With Vacuum and Leak Standards", Charles D. Ehrlich, presented November 21, 1985, 32nd National Symposium of the American Vacuum Society, Albert Thomas Convention Center, Houston, TX.
60. "Leak Rate Units", Charles D. Ehrlich, talk presented August 20, 1985, Forum on Standard Leak Calibration, Sandia National Laboratories, Albuquerque, NM.

## CURRICULUM VITAE

1. **Family name:** Todorova
2. **First names:** Ani
3. **Date of birth:** 22 February 1968
4. **Nationality:** Bulgarian
5. **Civil status:** Married, one daughter
6. **Business phone/** + 359 2 980-89-20  
**E-mail** atodorova@sasm.orbitel.bg
7. **Education:**

Institution [ Date from - Date to ]	Degree(s) or Diploma(s) obtained:
Tula University, Russia [1996-2002]	M.S., Computer Sciences, System engineer
Management School, Sofia, Bulgaria and Open University, U.K. [1998-2000]	Dipl. Mngt (O.U.), Diploma on Management

8. **Language skills:** Indicate competence on a scale of 1 to 5 (1 - excellent; 5 - basic)

Language	Reading	Speaking	Writing
Bulgarian	1	1	1
Russian	1	2	2
English	1	2	2
French	4	5	5

9. **Present position:**  
President of State Agency for Metrology and Technical Surveillance
10. **Years within the firm:** 4 years
11. **Professional experience:**

Date from - Date to	Location	Company	Position	Description
Nov 2002- now	Sofia	State Agency for Metrology and Technical Surveillance (former State Agency for Standardization and Metrology)	President	Responsible for harmonization of legislation in the field of legal metrology, pre-packaging and New Approach Directives and enforcement of the Law on Measurements and the Law on Technical Requirements for the Products

## Curriculum vitae

April 2002– Nov 2002	Sofia	State Agency for Standardization and Metrology	Vice – president	Supervising harmonization of legislation in the field of legal metrology and pre-packaging and implementation of the Law on Measurements
May 2000– April 2002	Sofia	State Agency for Standardization and Metrology	Director of National Center of Metrology	Organizing activities related to national measurement standards and traceability, issuing type approvals of measuring instruments, organizing activities related to the gaming machines and fiscal devices
1997– May 2000	Kozloduy	Kozloduy NPP, Metrology and Standardization Department	Head of Metrology and Standardization Department	Responsible for metrological support of activities on the whole site of Kozloduy NPP, organization of 7 metrological laboratories, assisting NPP staff in all aspects of standardization
1994– 1997	Kozloduy	Kozloduy NPP, Metrology and Standardization Department	Head of Laboratory at	Organizing laboratory activities for calibrators of measuring instruments and measuring systems (excluding ionising radiations) at units 5 and 6 at Kozloduy NPP
1992– 1994	Kozloduy	Kozloduy Nuclear Power Plant (NPP), Metrology and Standardization Department	Engineer on Information and Measurement Systems	Caring out calibrations of measuring instruments and measuring systems (excluding ionising radiations) at units 5 and 6 at Kozloduy NPP

### 12. Membership of professional bodies:

Member of the Union on Metrologists in Bulgaria (ungovernmental organization) since 1993, vice – president of the Union of Metrologists in Bulgaria since 2000

Member of Commission on Gambling (state authority established to the Ministry of Finance in Bulgaria) since January 2003

Bulgarian representative in Meter Convention, CIML, EUROMET, WELMEC, COOMET (authorisation is given by the Law on measurements)

Member of EUROMET Executive Committee since June 2004

Member of WELMEC Chairman's Group since January 2004

### 13. Other skills: (e.g. Computer literacy, etc.)

Computer literacy: MS Office, Internet, databases - user friendly

### 14. Key qualifications:

Fellowship under the IAEA programme, September – December 1998, Analysis and Measurement Services Corp, Knoxville, TN, USA, case study on calibration of thermocouples and resistance thermometers and homogeneity of thermocouples



## Curriculum vitae

### 15. Other relevant information: (e.g., Publications)

- Direct involvement in the process of alignment of the Bulgarian national legislation in the field of metrology and New Approach with the European one
- Direct involvement in international cooperation in the field of scientific and legal metrology
- Sound knowledge in conformity assessments and free movements of goods
- Sound experience in industrial metrology
- Author of 10 publications at national metrology conferences