



NCSLI Newsletter

NCSL International

Serving the World of Measurement Since 1961



NCSLI Newsletter
Vol 45, No. 3, July 2005

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NCSL International is a non-profit Colorado corporation. It is an international association of laboratories and organizations that maintain or have an interest related to measurement standards and calibration facilities.

The NCSLI Newsletter is sent to NCSL International member organizations (3 copies) and to a special listing of activities and key personnel whose work is closely related to that of NCSL International. Send member delegate address changes to the NCSL International Business Office at 2995 Wilderness Place, Suite 107 Boulder, CO 80301-5404.

NCSLI acknowledges and thanks Agilent Technologies for sponsoring the NCSLI Newsletter Editor position.

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Visit our website:

<www.ncsli.org>

On the cover: Courtesy of Lockheed-Martin

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Editing-and the NCSLI "Personality"

It was way back in December, 1978, that I took over the editing assignment for this NCSLI Newsletter from Wilbur Anson. There is good news and bad news in that statement. The good news is that I love the smell of printer's ink, and enjoy the camaraderie of all you people involved in the world-wide activities of NCSLI. I still stand in awe at the global influence that all of you people in our organization now wield in the serious matters of world metrology.



*John Minck
NCSLI Editor*

The bad news is that, after 26 years of doing the same thing, anyone might get a bit complacent about the job. I always used to say about my other real job, "It isn't so much like N years of experience. If you aren't growing in wisdom, it is ONE year of experience, N times."

The roster pages in the back of this newsletter now contain 130 different industrial volunteers, and each one is empowered to furnish their activity reports. So there is plenty of raw material, and thus the content mostly flows from those reports. I clean them up to a common format, headlines, sub-heads, printer fonts, etc., for a consistent "look." But I don't do what some other pubs like Time Magazine do with skilled re-write editors, who make every page sound like the same writer.

The content is NOT a Proceedings or Transactions, other than an occasional technical paper. It is, after all, a NEWSletter. Our business is measurements and the wide variety of things we do with the data. I did live 37 years in measurements, but never managed a metrology lab. You metrology managers of today are up to your eyebrows in technical projects and budgets and personnel management and uncertainty analyses. You may have newsletter needs that I may not be aware of.

NCSLI is a professional organization of considerable sophistication. Our member companies and organizations are in world-class positions of commerce and legal and government and political power. Our member delegates and all our roster of industrial volunteers are people of distinction and merit. Their jobs and titles are impressive and crucial to the performance and results that are in our NCSLI vision.

(Continued on page 44)

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PRESIDENT'S MESSAGE



Harry J. Moody
NCSLI President

2005 Annual Workshop and Symposium

Final preparations are being made to make this year's annual Workshop and Symposium at the Washington Hilton & Towers, Washington, DC on August 7-11, 2005 a success. The theme of this year's Conference is:

Advances in Science and Technology - Their Impact on Metrology

Due to the excellent support from the NCSLI membership, the conference registration is on a positive trend for Washington, DC. The conference committee has been working on this conference for over a year and the program is excellent. We will have Dr. Hratch G. Semerjian from NIST as the Keynote speaker along with outstanding luncheon speakers.

You still have time to make plans to attend the conference. See all the details on the following 12 pages or visit the NCSLI conference website at <http://www.ncsli.org/conference/2005> for details. The conference still is the best venue to network with your peers, visit more than 150 vendors, and attend excellent paper presentations.

NCSLI Leadership Workshop

In an effort to develop future NCSLI International leaders, enhance networking, and build communication, NCSLI introduced an annual "NCSLI Leadership Workshop" last year at the conference. To strengthen the communication within the NCSLI leadership, this Leadership Workshop will be held again this year.

Various Board members will be conducting the workshop at this year's Annual Workshop and Symposium in Washington DC on Sunday, August 7, 2005, from 1:00 p.m. to 4:00 pm.

The agenda for this workshop will focus broadly on leadership and communication skills and the NCSLI organization. All of our extended Board members (in the roster section of this newsletter) are encouraged to attend. Other NCSLI member delegates who have an interest in taking on a volunteer role in NCSLI work should also attend. (We may have a committee for you.) Topics for conversation will include:

- 2005 in review [Harry Moody]
- Breakthrough Objectives for 2006 [Jeff Gust]
- Long-Range Plan for 2006-2010 [Jeff Gust]
- US Measurement system [NIST]
- Committee Planning [Larry Nielsen]
- Meeting Strategies
- Recruiting Volunteers to Assist
- Meeting Minutes and Archives
- Quarterly Board and Newsletter Reports
- Committee Chair Handbook [Terry Condor]
- Uses of the NCSLI Web Site [Craig Gulka]
- NCSLI Region/Section Coordinator Forum [Derek Porter]
- Membership Coordinator training
- Speakers List

- Networking
- Region/Section Coordinator Handbook [Lonnie Spires]
- Administrative Guidelines [Dave Abell]
- Leadership Process Plan [Dave Agy]
- Publications [Mike Lombardi]

April Board Meeting

The NCSLI Board of Directors held their second meeting this year in Boulder, CO at the NCSLI International office. The Board continues to work on the key initiatives for 2005. The marketing committee continues to meet and make changes in the way that we market NCSLI. The best example of this change is the brochure and the poster advertising the conference. They were both good examples of professional, well-designed marketing material. I am very happy with the progress of this committee.

The Board of Directors as a whole met on Tuesday afternoon for a scenario planning session facilitated by Dave Abell. The Board will continue to meet at the next few Board meetings to complete this process. The purpose of this planning session is to provide a roadmap of where NCSLI will be in the future and how to plan on meeting the needs of the membership as our global metrology world moves forward.

One of the 2005 initiatives is to have more deliverables to NCSLI members. The Board voted to further investigate the possibility of having a quarterly NCSLI technical magazine in addition to the newsletter that will provide additional technical information to our membership.

The next Board of Directors meetings will be held in Washington DC at the conference on Sunday (8/7/05), Friday (8/12/05), and Saturday (8/13/05). If you have time, stop by and see what goes on at the Board meeting. You, as NCSLI member delegates, are always welcome at the meetings.

Publications

Mike Lombardi has his hands full with all of the RP's and RISP's that are in the process of being reviewed. Mike has several publications that have been rewritten and they are going through the technical editing process. The good news is that we will have several new publications out this year.

Thoughts While Drift Boating

Recently I had the opportunity to get my drift boat out on the Snake River and float a 25-mile stretch of the river. Whether that is good or bad, it gives a person a lot of time to think about many different topics. I was in the process of writing this president's report and I came up with a few things I wanted to address.

(Continued on page 51)

NCSL International 2005 Workshop & Symposium

Advances in Science and Technology -- Their Impact on Metrology

Advances in Science and Technology continue at an ever-increasing rate, especially in the fields of Medicine, Nano-technology, Biology, and Space Sciences. These advances impact the metrology community in many ways, from requiring the support of new standards and parameters, to providing state of the art quantum standards, to computerizing and automating measurement systems. The 2005 NCSLI Workshop & Symposium will provide a forum to discuss the impact these advances have had on metrology, as well as other related issues.

Some basic examples illustrate the advances in Science and Technology that have shaped our current metrology practices. In DC Voltage, many metrologists started their career using saturated cells capable of maintaining the volt at 1 ppm. They then switched to commercially available solid-state Zener standards which could maintain the volt at 0.3 ppm. Today calibration laboratories have access to portable Josephson Junction array technology with uncertainties better than 0.05 ppm. This represents a 20-fold increase in capability! In the area of mass measurements, the balances used 25 years ago were a double pan design with a sensitivity of 4.0 micrograms. Today, you can purchase electronic balances with 0.1 microgram resolution, an improvement of over 40 times.

One challenge for the metrology community is to develop standards and calibration techniques to support these advances in science and technology. Both calibration laboratories and National Metrology Institutes are finding it increasingly difficult to not only maintain all of their existing standards and capabilities, but they must expand their capabilities to include a larger dynamic range, lower uncertainties, and improve their efficiency. In addition, they must also develop, implement and maintain brand new capabilities that did not exist only a few years ago.

Papers, Panels & Workshops:

The Technical program offers papers, panels, and workshops that explore this year's Conference theme, and are organized into the following five categories:

- Theoretical
- Applied
- Management & Quality
- International
- Invited



Washington Hilton & Towers August 7-11, 2005 Washington, DC

Exhibits:

Meet with key executives and leading technical experts from over 120 of the top Measurement Science industry innovators and suppliers from around the world. To keep pace with rapidly changing technology, this Conference is a must.

Networking:

The Workshop & Symposium affords unparalleled opportunities to meet with key individuals in the field of Metrology to collaborate and gain new information and insights that can help solve ongoing challenges with fresh perspectives, new skills and new partnerships. Examples of areas of involvement include automotive, analytical chemical, pharmaceutical, and forensics.

Tutorials:

The 2005 Conference will include a series of tutorials presented before and after the conference. There will be more tutorials this year than in past years. Some of the subjects to be covered include Temperature, Accreditation, and Uncertainty, among others. Please visit the NCSLI Website, www.ncsli.org, for the titles and abstracts of all of the 2005 tutorials.

Hotel Information:

Washington Hilton & Towers

1-800-Hiltons (445-8667)

Group Name: NCSL International

Room Rates: Single \$150

Double \$160

For more information, please visit our website at www.ncsli.org/conference/

TUTORIAL ABSTRACTS

Saturday, August 6, 8:00 a.m. - 12:00 p.m.

Fundamentals of Temperature Calibration

Thomas Wiandt & Ron Ainsworth
Hart Scientific, Inc.
American Fork, UT

This presentation is a review of the fundamentals of temperature calibration. Topics include calibration equipment, calibration techniques, curve fitting issues, and the mathematics important to thermometry. Types of thermometers covered include platinum resistance thermometers, thermistors, thermocouples, and combined thermometer/readout systems. This segment is intended for those who are new to temperature calibration, those who need to validate what they already know, or those who just have some nagging questions that need to be answered.

Balance and Scale Calibration & Use

Val Miller
National Institute of Standards and Technology
Gaithersburg, MD

Weighing processes are a significant part of many manufacturing and analytical processes. This tutorial will present an overview of the calibration and use of weighing devices in the analytical environment. It will focus on the use of weighing techniques, correct procedures, eliminating and minimizing sources of errors, and compliance with the weighing requirements of the USP, FDA and ASTM. Classification schemes and calibration procedures for balances and scales will be covered. The approach will discuss the selection and use of standards, artifacts, procedures, facilities, equipment, measurement assurance, and software to determine how each contributes to the quality of mass measurements, the impact on the overall laboratory capability, and the effect on the production environment.

Saturday, August 6, 1:00 p.m. - 5:00 p.m.

Temperature Calibration Uncertainty Analysis

Thomas Wiandt & Ron Ainsworth
Hart Scientific, Inc.
American Fork, UT

This presentation is a step by step review of the tools necessary to evaluate the uncertainties present in temperature calibrations. Topics include curve fitting errors, error propagation, error budgeting, TURs, and statistical process

control. Also discussed will be pertinent fundamentals of uncertainty analysis as outlined in the Guide to The Expression of Uncertainty in Measurement (GUM). This segment is intended for those who are new to uncertainty analysis as well as those who are well versed but require further guidance or clarification.

Balance and Scale, and Weighing Process Uncertainties

Val Miller
National Institute of Standards and Technology
Gaithersburg, MD

One requirement of traceability of measurement results is calculating the associated measurement uncertainty. This tutorial will present concepts and methods for calculating and evaluating the uncertainty of balance and scale calibrations. Weighing processes in the industrial and analytical environments will also be discussed. Attention will be focused on the sources of errors in weighing operations, methodologies for estimating the magnitude of errors, and computation and reporting of the measurement uncertainty associated with reported weighing measurement results. This approach is based on the content of NIST IR6919, Recommended Guide for Determining and Reporting Uncertainties for Balances and Scales.

Measurement Uncertainty Made Easy

Mike Ouellette
National Research Council Canada
Ottawa, ON Canada

Why is it important to express the uncertainty in measurement? Quite simply, there is no traceability in measurements that lack statements of uncertainty at every link of the traceability chain. For this and other reasons, ISO/IEC 17025 requires calibration laboratories, in particular, to provide estimates of uncertainty of their measurements using accepted practices. The instructor will discuss the basics for preparing uncertainty estimates for typical uncomplicated measurement processes. His approach is consistent with the GUM but it dispenses, wherever possible, with the algebraic notations, statistical jargon, arithmetic modeling, and differential calculus operations found in the GUM that perhaps encumber a person who requires no more than a simple, conservative estimate of the uncertainty in the result of a simple measurement process. For these situations, it will be shown that the mathematics is quite straightforward and that the actual challenge, if any, to estimating uncertainty in measurement is in defining the factors that affect the measurement; namely, in understanding the metrology. Participants will receive an example Excel spreadsheet for making simplified uncertainty calculations. The tutorial will include a group exercise. Participants should bring stationary and pocket calculators.

Sunday, August 7, 8:00 a.m. - 12:00 p.m.

Very Low Pressure Calibration

Karl Kurtz, Mike Bair and Matt Daniels
DH Instruments, Inc.
Phoenix, AZ

This course focuses on the special challenges of very low gauge and differential pressure calibration. Topics range from the fundamental concepts of pressure measurements to the unique practical issues encountered in hardware setups, data acquisition and the measurement process. The calibration influences that become dominant at very low pressure are analyzed. Participants experience hands-on measurement exercises illustrating the points discussed.

Practical Modelling of Measurements for the Uncertainty Evaluation

Measurement of Temperature, Pressure and Electrical Quantities
Dr. Klaus-Dieter Sommer
Thüringian State Bureau for Metrology and Verification (LMET)
Ilmenau, Germany

The modeling of the measurement is a key element of the evaluation of measurement uncertainty in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). It is the aim of the modeling procedure to mathematically establish the relationship between the measurand and all input quantities, which may contribute to the uncertainty associated with the measurement result. This relationship serves as a basis for the uncertainty propagation as well as for computer-aided uncertainty determination. Since neither the GUM nor other relevant uncertainty documents provide any guidance on the modeling of measurements, the modeling of measurements appears to be the most difficult problem of uncertainty evaluation in accordance with the GUM.

With a view to overcome this problem, a straightforward and highly versatile modeling procedure has been developed which is based on the idea on the classical measuring chain. It is structured into five elementary steps, and only three types of modeling components are employed. Furthermore, it will be shown that almost all measurements and calibrations can be reduced to only a few generic model structures, which, on their part, can easily be tailored to the particular measurement procedure.

The tutorial will give an introduction to the above modeling concept with numerous examples from measurement and calibration in the steady state. The main focus will be laid on the measurement of temperature, pressure and electrical quantities. On the basis of both

comprehensible and -if desired- advanced exercises and practical examples, the participants will be qualified to systematically analyze and perform the modeling of their measurement and calibration procedures with a view to mathematically establishing the so-called model equations.

Due to the limited number of participants, to a certain extent there will be the possibility given to individually discuss particular modeling problems.

Laboratory Accreditation: The Process from A to Z

Dana Leaman
American Association for Laboratory Accreditation (A2LA)
Frederick, MD

What does one need to know regarding the accreditation process to 17025? What should be expected? Where does one start? The accreditation process can be very confusing for anyone. Knowing what to expect throughout the accreditation process can alleviate much of the confusion and make the entire process a positive learning experience.

ISO/IEC 17025, "General requirements for the competence of testing and calibration laboratories" is the internationally recognized standard for determining the competency of testing and calibration laboratories. The American Association for Laboratory Accreditation currently operates an Accreditation program to ISO/IEC 17025 within eleven major fields. This paper discusses the steps of our accreditation process from beginning to end offering insights into avoiding many of the pitfalls of the process.

Running an Effective Laboratory - Measuring Performance

(Sponsored by the NCSLI Small Business Initiative Committee)
Greg Powell
The Signal Group
Seattle, WA
Malcolm Smith
NCS Laboratories
Vancouver, BC
Canada

This tutorial will be of interest to owners, managers, and supervisors of calibration laboratories, both in-house and commercial. The tutorial will cover four areas where performance measurement is important in the running of a laboratory: productivity, finance, marketing and customer satisfaction. The range of measures that can be used to monitor performance in each of these areas will be discussed. Suggestions on how these measures might be used in practice and in concert will be reviewed. Examples of measurements, with discussion of their effectiveness and appropriateness for process improvement, will be given.

Good, Bad, or Indeterminate: Using Guardbands to Help Make the Call

David Deaver
Fluke Corporation
Everett, WA

When calibration data is provided on a certificate, ISO 17025 requires a statement of the measurement uncertainty. In addition, if a statement of compliance with specifications is made, the uncertainty of measurement must be taken into account. This tutorial will describe some practical ways to consider uncertainties when making in-tolerance or out-of-tolerance declarations.

Measurement of Customer Satisfaction: An application of "soft" metrology

Jean-Claude Krynicki
Agilent Technologies
Palaiseau, France

What is customer satisfaction and how to measure it? Available methods to gather satisfaction data; How to build a pertinent customer satisfaction study questionnaire? Measurement process; Measurement uncertainties; Results interpretation and conversion into actionable items; More advanced methods; Inventory of resources.

Upon completion of this module the student will be able to design a customer satisfaction measurement tool, to perform a reliable interpretation of the result, to design presentations for Management reviews, to build a customer satisfaction dashboard.

Sunday, August 7, 1:00 p.m. - 5:00 p.m.

Very Low Pressure Applications

Karl Kurtz, Mike Bair and Matt Daniels
DH Instruments, Inc.
Phoenix, AZ

This course is intended to follow the NCSLI tutorial "Very Low Pressure Calibration" given at the 2004 and 2005 NCSLI Workshop and Symposium. Specific low pressure calibration applications are set up for discussion and hands on calibration training. Data taken during the hands on sections is analyzed and the uncertainties associated with the influences present in the calibration process are discussed in detail. Specific problems experienced by students either in their own labs or during the hands on section are discussed as time permits.

Evaluating Measurement Uncertainty in Chemical Laboratories

Wolfgang Richter
formerly at Physikalisch-Technische Bundesanstalt (PTB),
Braunschweig, Germany
Klaus-Dieter Sommer
Thuringian State Bureau for Metrology and Verification (LMET),
Ilmenau, Germany

Results of chemical analyses are often used as a basis for important decisions and agreements, particularly in such fields as health care, environmental protection, or international trade, and must therefore be reliable and trustworthy. Knowledge of measurement uncertainty, based on metrological traceability, is an important prerequisite for creating confidence in the quality of measurement and analytical results.

The ISO/BIPM Guide to the Expression of Uncertainty in Measurement (GUM) together with the EURACHEM/CITAC Guide to Quantifying Uncertainty in Analytical Measurement are accepted worldwide as master documents for evaluating measurement uncertainty in a uniform and consistent way.

The tutorial will give an introduction to the concepts of these documents and will provide both, the necessary knowledge and practical "recipes", for the evaluation of the uncertainty of analytical results.

Emphasis will be laid on practical examples. These will cover typical applications of chemical analysis often occurring in practice such as, for example, the determination of lead in water using atomic absorption spectrometry (AAS) and the determination of pesticide residues in a natural matrix. The tutorial will also address the proper use of data from interlaboratory studies and from method validation, which are available in most laboratories, for uncertainty evaluation. The participants will be enabled to evaluate the measurement uncertainty for analytical tasks that typically can be found in every day's laboratory practice.

Pipette Calibration and Use: Reducing Variability via Uncertainty Analysis and Bench-top Verification

George Rodrigues, Ph.D.
Artel
Westbrook, Maine

This workshop combines practical advice with hands-on experience for metrology managers, engineers, and calibration technicians. Participants will learn: Practices for the creation of an uncertainty budget for your pipette calibration program, as a prerequisite for 17025 accreditation and/or for identification of the most significant error sources. Simple and cost-effective strategies for mitigating the leading sources of liquid delivery variability in the laboratory; including environmental factors, operator technique, and undetected pipette failures. The focus of the workshop is on bringing the business value of metrology from the calibration facility to the process level -- to improve quality, reduce mitigation risk and lower calibration and rework costs. By addressing calibration concerns on the bench-top, the metrologist can have a positive effect on the bottom line while actually enhancing control over laboratory processes.

Force Calibration: Methods and Uncertainties

Michael Tovey
Tovey Engineering, Inc.
Phoenix, AZ

Force calibration is a special discipline with many considerations not common to other areas of metrology. Often measurement uncertainties are underestimated due to the omission of significant error sources. Metrologists must consider both mechanical and electrical boundary conditions to achieve calibrations with low measurement uncertainties. Factors such as second order material responses, and interaction of undesired parasitic loading due to fixture characteristics, misalignment of load frame components, stiffness, etc. can have significant influence on the measurement result. This tutorial will cover the characteristics of force transducers, force calibration methods, force calibration standards (E74 and ISO 376) and measurement uncertainty models. The tutorial begins at a basic level and leads to discussion of more complex issues.

The Shocking Aspects of ESD: Things You Should Know About Electrostatic Discharge

Patrick André
André Consulting, Incorporated
Bothell, WA

Electromagnetic Discharge, ESD, is often a misunderstood and undetected threat to electronic components and assemblies. More than anti-static mats and wrist straps, ESD control must be understood where ever electronics are handled. This course will cover tribocharging and current exchanges; types and differences of protective materials; ionizers; coatings and cleaners; and various types of mats, wrist straps, and foot worn discharge products. War stories will range from the common to the bizarre.

Measurement System Analysis Handbook for the Automotive Industry

Steve Stahley
Cummins, Inc.
Columbus, IN

The Automotive Industry Action Group Measurement Systems Analysis Handbook or AIAG MSA is the guiding document for services providers and manufacturers to the Automotive industry in establishing measurement systems capabilities. The MSA provides guidance on how to evaluate and quantify sources of measurement error and variation. It then provide guidelines to determine if a measurement system has the appropriate accuracy to perform the requirement measurements, typically comparing measurement systems accuracy to product specification. - The MSA is referenced by ISO/IEC TS 16949 and other quality tools called out by TS including PPAP (Product Part Approval Process) and APQP (Advanced Product Quality Planning). - The MSA Third Edition has been updated to consider the life cycle of a measurement system from specification through commissioning and on going maintenance. Also the concepts of measurement traceability and uncertainty of measurement are also introduced. - This seminar will cover the MSA 3rd edition, and will provide the student with an understanding of how to evaluate the basic sources of measurement error and variation as described in the MSA. The seminar will also include practical examples of how to use these methods.

Friday, August 12, 8:00 a.m. - 12:00 p.m.

Advanced Topics in Uncertainty Analysis

Howard Castrup, Ph.D.
Integrated Sciences Group
Bakersfield, CA

This tutorial examines methods and techniques of uncertainty analysis taken from the GUM, other published work and current research. Widely used statistical uncertainty analysis tools will be derived from scratch, allowing a discussion of their utility and applicability. In addition, methodologies, such as Monte Carlo, Bayesian, ANOVA, and SPC will be discussed and an error analysis model will be developed that provides a rigorous framework for uncertainty analysis. Concepts will be illustrated using shareware and commercially available software.

Laboratory Data Management: "If the Data Don't Match, then the Answers Won't Hatch."

Donald W. Wyatt, President
Diversified Data Systems, Inc.
Tucson, Arizona

This tutorial is intended for calibration managers, metrologists, or information technology professionals with responsibility for developing or maintaining calibration data management systems.

The tutorial methodically reviews the data that needs to be captured, validation guidelines that can ensure the integrity of the data, and the analysis and reporting that can improve the efficiency and productivity of a calibration lab. The scope of the tutorial includes data required for regulatory compliance, data necessary for process control, data sought by customers of the lab, as well as data valuable for business unit management and administration.

Attendees will gain valuable insights and understandings, which will benefit either the search for a new data management system or the quest to improve an existing system.

Inventory Data Normalization: The Whys, Wherefores and Techniques

Charles A. Motzko, P.E.
C. A. Motzko & Associates
Tucson, AZ

This tutorial examines the data normalization process for new or existing calibration and equipment management databases from both a practical and theoretical perspective. Alternatives will be discussed to deal with legacy systems as well as migration strategies to 4G databases. The operating premise is that data should be treated as a most valuable resource, but without a clear way for the enterprise to define, interpret or reference, the data is meaningless. Examples and checklists will be presented to illustrate multiple approaches to the normalization or migration process. Problem brainstorming and topical discussion will be encouraged.



NCSLI International 2005 Workshop and Symposium

Guest Registration

August 6-12, 2005 - Washington, DC

Conference language: English
Conference currency: USD

Registration Options

Register on-line at www.ncsli.org

Fax or Phone Credit Card Registrations to: Fax: 303.440.3384 – Phone: 303.440.3339

Mail Check or Credit Card Registrations to: NCSLI International, 2995 Wilderness Place, Suite 107, Boulder, CO 80301-5404

Guest Program Dates & Fees

Badges are required at all NCSLI Events.

<input type="checkbox"/> Evening Reception	Sun	Aug. 7	7:00 p.m. - 9:00 p.m.	N/C
<input type="checkbox"/> Orientation and Continental Breakfast	Mon	Aug. 8	7:30 a.m. - 8:30 a.m.	N/C
<input type="checkbox"/> Tour "Welcome to Washington"	Mon	Aug. 8	9:00 a.m. - 1:00 p.m.	\$40
<input type="checkbox"/> Tour "The Presidents/Embassy Row/Diplomacy"	Tue	Aug. 9	10:00 a.m. - 2:00 p.m.	\$45
<input type="checkbox"/> Conference Reception & Banquet - Galileo Players	Tue	Aug. 9	6:00 p.m. - 9:30 p.m.	\$85
<input type="checkbox"/> Tour "Law and Order"	Wed	Aug. 10	9:00 a.m. - 1:00 p.m.	\$40
<input type="checkbox"/> International Event - Sunset dinner cruise on the Potomac aboard the "Dandy" riverboat	Wed	Aug. 10	5:30 p.m. - 10:30 p.m.	\$75
Lunch tickets to the Workshop and Symposium:				
<input type="checkbox"/> Lunch Mark Hurwitz, President & CEO, ANSI	Mon	Aug. 8	12:15 p.m. - 1:45 p.m.	\$35
<input type="checkbox"/> Lunch Member Delegates Meeting	Tue	Aug. 9	12:15 p.m. - 1:45 p.m.	\$35
<input type="checkbox"/> Lunch Greg Hahn, Comedian	Wed	Aug. 10	12:15 p.m. - 1:45 p.m.	\$35
<input type="checkbox"/> Lunch John Kitching, NIST Physicist	Thur	Aug. 11	12:15 p.m. - 1:45 p.m.	\$35

Registrant Information (Please print or type)

First Name: _____

Host's Name: _____

Last Name: _____

Telephone Number: _____

Address: _____

Organization: _____

City/State/Zip/Country: _____

Dept./Mail Stop: _____

Telephone Number: _____

Address: _____

E-mail: _____

City/State/Zip/Country: _____

Special Accommodations

- Please check here if you require special ADA, wheelchair, or dietary needs, and attach a written description so we may serve you.
Please note the only alternate meal option offered at this time is a vegetarian plate.

Credit Card Information

VISA Mastercard American Express Discover Card #: _____

Full name as it appears on card: _____ Exp. Date: ____/____/____

Signature: _____ Date: ____/____/____

Cancellation Policy

Full Guest Program registration fees will be refunded if written notice is received (by fax or mail) by July 11, 2005. You may transfer your paid Guest Program registration to another individual to attend in your place without penalty. **WRITTEN AUTHORIZATION FOR THIS SUBSTITUTION IS REQUIRED.** Please mail or fax written notice of substitution to the NCSLI International business office to arrive by July 29, 2005. NCSLI reserves the right to cancel any of the Guest Program events if the number of registrations is below the contracted minimum with the tour company.

For NCSLI Use Only

Registration Received: ____/____/____ CK # / CC App #: _____ CK / CC App Date: ____/____/____

Payment Received: ____/____/____ PO / Inv. #: _____ Amount: \$ _____ Entered: ____/____/____

CONFERENCE TOURS

Join us on Friday, August 12,
for a tour of the new NIST Advanced Measurement Laboratory

Tour space is limited, so sign up early! Only registered conference attendees may attend. There are four tours, each of a different aspect of the facility. Choose from Physical, Electrical, Optical/Physics, or the Center for Neutron Research/Nanofabrication Facility. The following is a general description of the facility, and the inside pages contain descriptions of the individual tours. Tour cost is \$35.

Advanced Measurement Laboratory

To spy an individual molecule in a throng of millions, to seize it, and to manipulate it. ... To arrange atoms into an ordered nanotechnology landscape of precisely spaced steps and terraces. ... To determine the size of an electrical current by tabulating, one by one, the number of electrons flowing by. ... To gauge distances in increments tinier than the radius of an atom. ... To measure the strength of a chemical bond between an antibody and a virus particle.

These and other extreme capabilities are key to the nation's high-technology future, the competitiveness of its industries, and the health and well-being of its citizens. They are essential for our nation to realize the societal benefits and seize the commercial promise of the nanotechnology discoveries now being made in laboratories around the world. And they are among the goals of more than 100 horizon-stretching research projects to be housed in the newly built Advanced Measurement Laboratory (AML) at the National Institute of Standards and Technology (NIST).

Completed in 2004, the AML has few-if any-equals among the world's research facilities. It offers an unprecedented combination of features designed to virtually eliminate environmental interferences that undermine research at the very tip of the leading edge of measurement science and technology.

Accomplishments at the AML will translate into new high-accuracy measurement technologies, databases on the fundamental properties of "nano-structured" materials, and other essential supporting tools and capabilities. U.S. industry and its university and government partners require these infrastructural technologies if they are to succeed fully in scaling today's feats of molecular science and engineering into nanotechnology products and processes for domestic and international markets.

Practical benefits will flow to diverse industries and areas of need-from environmental protection to homeland security to biotechnology.

Each tour has room for 36 people. The tours will be divided into groups of 12. Each group will see all the stops within that tour, in varying order. One group will visit Tour Stops 1-2-3, another group will visit Stops 2-3-1, and the third group will visit Stops 3-1-2. All tours will be conducted simultaneously, and participants must stay with their selected tour group.

Tour A - Physical/Dimensional -- **SOLD OUT!**

Planned tour stops in this category include state-of-the-art mass, dimensional coordinate measuring machine, and small force measurements.

Stop 1. The Standard Kilogram

This presentation includes a report on the present state of the unit of mass, the limitations, the needs, and the research areas that NIST is undertaking, as well as a brief overview of the possible alternatives being considered for the re-definition of the kilogram. In addition, visitors will tour our new state-of-the-art mass measurement facilities and receive an overview of the mass calibration services, including traceability and uncertainty budgets.

Stop 2. Dimensional Metrology: Ultra-High Accuracy Coordinate

This tour stop will show in operation the NIST-enhanced ultra-high-accuracy Moore 48 Coordinate Measuring Machine. Housed in the subterranean level of the new NIST Advanced Measurement Laboratory in a state-of-the-art temperature controlled environment, the system attains measurement accuracies of tens of nanometers, making it arguably the most accurate instrument of its type in the world.

Stop 3. Small Force Metrology Laboratory

The NIST Small Force Metrology Laboratory is home to the world's only Electrostatic Force Balance, a new high-resolution vacuum weighing instrument for atomic force microscopes and instrumented indentation force calibration.

Tour B - Electrical -- **SOLD OUT!**

Planned tour stops in this category include

Stop 1. Voltage Metrology

The mission of the voltage standard lab at NIST is to maintain the U.S. legal volt and to provide for the dissemination of an internationally consistent, accurate, reproducible, and traceable voltage standard that is tied to the SI units and readily and continuously available for the U.S. scientific and industrial base. It also cooperates with the Quantum Device Group in Boulder to utilize advances in the application of quantum voltage standards.



The NIST Advanced Measurement Laboratory was designed by HDR Architecture Inc., and built by Clark/Gilford, Joint Venture.

Stop 2. Resistance Metrology

Resistance standards are used to support a wide variety of impedance, temperature, strain, power and current measurements, over a wide range of frequency, and at very high levels of accuracy. NIST maintains the U.S. legal ohm with the quantum Hall resistance (QHR) and can help U.S. industry to demonstrate and verify in a cost-effective way the accuracy of electrical measurements and the performance of high-precision instrumentation in a competitive world environment.

Stop 3. Power and Energy Metrology

The NIST Power and Energy Laboratory performs calibrations of commercial standard watt, watthour, var, and varhour meters. Virtually all residential revenue metering in the United States is traceable to this laboratory through these standards, which are submitted to NIST by electric power utilities, state public utility commissions, and meter manufacturers. On this tour stop you will see the NIST-developed power bridge used to perform these calibrations and hear about the research NIST is performing in support of the electric power industry.



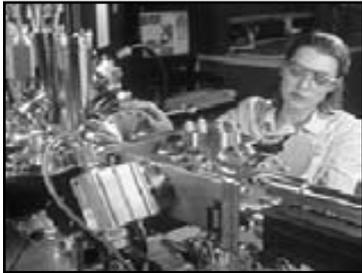
Ultraprecise electrical measurements require extremely stable temperature, humidity, and vibration control. Here, a NIST physicist in one of the AML's metrology laboratories prepares to measure the international standard for resistance—the quantum Hall effect.

Tour C - Optical/Physics

Planned tour stops in this category include High Accuracy Cryogenic Radiometry (HACR), Quantum Computing, and Special Irradiance and Radiance Responsivity using Uniform Sources (SIRCUS).

Stop 1. High Accuracy Cryogenic Radiometry

The HACR, the nation's optical power standard with its intrinsic uncertainty of 0.02%, improves the radiometric accuracy throughout the Division and the nation. The facility currently operates in the 200 nanometers to 1000 nanometers range as well as out in the 10.6 micrometer range.



To continue to advance micro-chip technologies, scientists are studying ways to assemble individual molecules for use as active circuit components. Here a NIST researcher uses a scanning tunneling microscope to study the structure and electrical behavior of such molecules on gold surfaces.

Stop 2. Spectral Irradiance and Radiance Responsivity using Uniform Sources (SIRCUS)

SIRCUS is a reference calibration facility that transfers detector-based spectral irradiance scales, derived from the high accuracy cryogenic radiometer, to broadband, filtered detector packages, to transfer-standard spectral irradiance detectors, and to instruments that measure spectral radiance. Stabilized, tunable lasers and different-sized integrating spheres are used to create a high-intensity monochromatic source with flexible geometry.

Stop 3. First Class Science: Quantum Computing

Quantum information processing holds promise for such applications as high-precision measurement, secure communications, and computation of otherwise intractable problems. Quantum bits, or qubits, must be quantum mechanical objects capable of being in a superposition of two different states. Our approach is to use single atoms, cooled nearly to absolute zero and held in an optical lattice (a periodic optical nanostructure) as the qubits.

Tour D - NIST Center for Neutron Research (NCNR) and Advanced Measurement Laboratory (AML) Nanofabrication Facility

Planned tour stops in this category include dosimetry calibration, materials analysis and two premiere NIST user facilities for neutron research and nanofabrication.

Stop 1. NIST Center for Neutron Research

A recent report by the President's Office of Science and Technology Policy described the NIST Center for Neutron Research as "the only U.S. facility which currently provides a broad range of world-class capability" in neutron research. Used by more than 1,600 scientists and graduate students each year, this model national user facility provides beams of neutrons (subatomic particles released by the nuclei of atoms) for state-of-the-art science and engineering research in biotechnology, nanotechnology, chemistry, physics, materials science, and even archeology and art history.

Stop 2. Nanofabrication Facility

The NIST Nanofabrication Facility is an 8,520 square meter facility incorporating 12 Class 100/ISO 5 clean-room bays. The Nanofabrication Facility will enable fabrication of prototypical nanoscale test structures, measurement instruments, Standard Reference Materials, electronic devices, microelectromechanical systems, and biodevices critical to biotechnology, nanotechnology, homeland security, semiconductor manufacturing, and other key national needs.

Keynote Address - Monday, August 8, 2005 - 9:30 AM

Expanding the Frontiers of Measurement

Dr. Hratch Semerjian, Acting Director
National Institute of Standards and Technology



As the U.S. National Measurement Institute (NMI), NIST is constantly expanding the frontiers of measurement to promote innovation, advance U.S. manufacturing, facilitate trade, improve public safety and security and improve the quality of life. Through cutting edge research in areas as diverse as nanotechnology, biotechnology, quantum computing, and homeland security, NIST supports U.S. industry needs for new and unique metrology and measurement services. While NIST is expanding its measurement capabilities into new areas, it is continuing to address the measurement challenges posed in creating an “electronic” kilogram and measuring frequency to the femtosecond level.

The commissioning of NIST's new Advanced Measurement Laboratory in 2004 has provided NIST scientists and engineers with a unique facility that allows both cutting edge research and state-of-the art measurement capabilities. These include the provision of calibrations, standard reference materials (SRM's), standard reference data (SRD) and accreditation of laboratories, both for calibration and testing. The services themselves, and the ways in which they are provided, are being improved, as NIST strives to meet new demands by its customers and by changing technology. The Acting Director of NIST will describe NIST's response to today's measurement and standards challenges.

Hratch G. Semerjian is the acting director of NIST. In this position, Dr. Semerjian is responsible for overall operation of the Institute, effectiveness of NIST's technical programs, and for interactions with international organizations. Dr. Semerjian received his M.Sc. (1968) and Ph.D. (1972) degrees in engineering from Brown University. He served as a lecturer and post doctoral research fellow in the Chemistry Department at the University of Toronto. He then joined the research staff of Pratt & Whitney Aircraft Division of United Technologies Corp. in East Hartford, Conn. In 1977, Dr. Semerjian joined the National Bureau of Standards (now NIST), where he served as director of the Chemical Science and Technology Laboratory (CSTL) from April 1992 through July 2003. Awards he has received include the Fulbright Fellowship, C.B. Keen Fellowship at Brown, the U.S. Department of Commerce Meritorious Federal Service (Silver Medal) Award in 1984, and the U.S. Department of Commerce Distinguished Achievement in Federal Service (Gold Medal) Award in 1995. In 1996, he was elected a Fellow of the American Society of Mechanical Engineers. In 1997, he received the Brown Engineering Alumni Medal. Dr. Semerjian was elected to the National Academy of Engineering in 2000.

Monday Luncheon Speaker

Supporting Advances in Science and Technology Through Implementation of the National Standards Strategy for the United States

Dr. Mark W. Hurwitz, Ed.D., CAE
President and Chief Executive Officer, American National Standards Institute (ANSI)



The U.S. standardization model resembles both the nation's political structure and economic structure. It is sector-based, driven by market needs, and relies strongly on diversity, decentralization, and the cooperation of private and public sector participants in order to meet the critical standardization needs of the nation. Today, however, the cultural, economic and regulatory factors that have helped to shape this system are being tested as the trend towards globalization draws increasing attention to standards that are relevant around the world, rather than regionally or locally relevant.

In order to meet new areas of need in critical areas such as homeland security, nanotechnology, social responsibility and others, the traditional strengths of the U.S. system must be married with new requirements.

Consensus, openness and transparency remain important, but they are joined by requirements for speed, relevance, and meeting the needs of public interest constituencies. In early 2005, the U.S. will complete its first major review and revision for the National Standards Strategy (NSS) that was approved in 2000. Dr. Mark W. Hurwitz, CAE, ANSI president and CEO, will comment on the revision of the NSS, the relevance of various principles of this strategy to global standardization, and its impact on the metrology community.

Dr. Mark W. Hurwitz, CAE, was named President and CEO of the American National Standards Institute (ANSI) by its Board of Directors on July 1, 1999. As ANSI's president, Dr. Hurwitz serves as ANSI's principal representative to the ISO Council and as a member of the Ad Hoc Executive Committee of COPANT, the Pan American Standards Commission. He is also a member of the U.S. Trade Representative's Industry Consultations Program, serving as a member of the Industry Functional Advisory Committee (IFAC) on Standards for Trade Policy Matters.

Prior to joining ANSI, Dr. Hurwitz served as chief executive officer and executive vice-president of the American Institute of Architects (AIA). He is a past executive vice-president of the Building Owners and Managers Association International (BOMA) and a former senior vice-president and chief operating officer of the National Association of Professional Insurance Agents. Dr. Hurwitz founded the Center for Association Leadership in Princeton, N. J., an association management consulting firm; he is also a frequent speaker at association management symposia and has been a guest professor at several colleges and universities. Dr. Hurwitz was born in Philadelphia, Pennsylvania and earned his doctorate in administration from Temple University. He and his wife, Josette, reside in Alexandria, Virginia.

GUEST TOURS

Monday Tour: WELCOME TO WASHINGTON! \$ 40

This tour is 4 hours, starting at 9:00AM

An introduction to the city of **Washington, DC**. You will travel down the famous parade route of *Pennsylvania Avenue* passing many notable buildings, ending at the **U.S. Capitol Building**. Proceeding on to the nearby **National Mall** you will pass many of the buildings belonging to the *Smithsonian Institution*, and the *Washington Monument*. Arriving at the **Lincoln Memorial**, you will stop to admire the tall and brooding statue of Abraham Lincoln. A short five-minute walk from the Lincoln Memorial brings you to the **Vietnam Veterans Memorial**, the **Korean War Veterans Memorial**, and the new **National World War II Memorial**.

The tour will continue past the *Jefferson Memorial* and the *Tidal Basin*, home of the world famous Japanese Cherry Blossom Trees. Nearby you'll stop at the **Franklin Delano Roosevelt Memorial**, the newest and the fourth monument to an American president on the National Mall. Your group will then cross over the *Memorial Bridge*, pass *Arlington National Cemetery*, and stop at the **Iwo Jima Memorial**. Beautiful views of the National Monuments and DC skyline can also be seen from this location.

Time permitting, your final stop of the day will be the **John F. Kennedy Center for the Performing Arts**, the only monument to the late President Kennedy that is located in our Nation's Capital. This will conclude an inside look at what Washington, DC has to offer with regard to unmatched architecture, history, patriotism and democracy.

Tuesday Tour: THE PRESIDENTS, EMBASSY ROW AND LESSONS IN DIPLOMACY \$ 45

This tour is 4 hours, starting at 10:00AM

Guests will enjoy a private tour of the **Washington National Cathedral** (begun in 1907 and consecrated in 1990), highlighting the roles our presidents have played in the history of the Cathedral. You will have time to stroll through the tranquil Bishop's garden and Herb Cottage, as well as browse the gift shop.

Next, you will travel through *Embassy Row*, passing beautiful embassies, chanceries and residences representing nations throughout the world. You will soon arrive at the **Woodrow Wilson House** for a private tour of the home that has the distinction of being Washington's only presidential home. Built in 1915 and filled with memorabilia of the 1920's, this house is truly a reflection of the man and his times.

Wednesday Tour: LAW & ORDER - A TOUR \$ 40

This tour is 4 hours, starting at 9:00AM

Today your group will travel down Pennsylvania Avenue passing the *Federal Triangle* government buildings, the J. Edgar Hoover FBI Building, the Department of Justice and the Law Enforcement Memorial, to arrive at the **U.S. Capitol Building**, where you will enjoy a brief narrative tour of the grounds of the Capitol.

Continuing on to the **U.S. Supreme Court**, visitors can view changing exhibits that depict the history of the "Highest Court".

Next, the group will stop at the **Library of Congress**, the world's largest library. On permanent display is "American Treasurers of the Library of Congress", a rotating exhibition of rare and unique items.

The final stop of the tour will be the **Jefferson Memorial**. Beneath the marble rotunda, the 19-foot statue of the third U.S. president is surrounded by passages from the Declaration of Independence and other famous Jefferson writings.

Conference Banquet - Tuesday, August 9, 2005

6:00 p.m. Reception (no host) - 7:00 p.m. Dinner - 8:00 p.m. **Galileo Players**

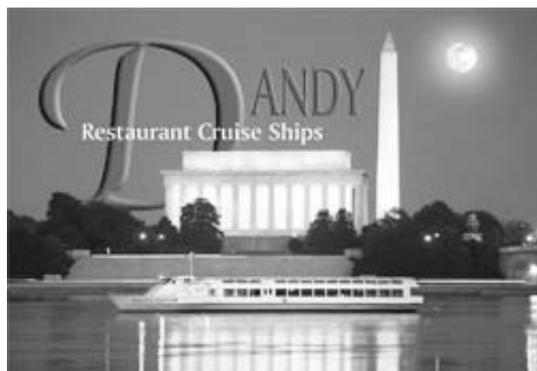
The Galileo Players are a professional sketch comedy and improv troupe that performs original comedic theater focusing on scientific, philosophical and intellectual themes. The Galileo Players are unique in that we tackle subject matter that is often ignored or perceived as intimidating, and present it to the public in a comedic, entertaining and accessible way. The Galileo Players delight in celebrating the world through a scientific eye, challenging people and making them laugh and think at the same time.

One banquet ticket is included with registration for the conference. Extra tickets may be purchased at \$85, either via the guest registration form or at registration on Sunday.



International Evening - Wednesday, August 10, 2005

Nina's Dandy Dinner Cruise \$75 - 6:00 pm - 10:30 pm



View our Nation's Majestic Monuments® aboard the sleek newly-built Nina's Dandy, featuring gourmet dining; and dancing on her 460 square foot marble dance floor in the main salon, or under the stars on the 3,750 square foot upper deck. Similar to the river boats of Europe, the Dandy and Nina's Dandy were designed to cruise under the dramatic low-arched stone bridges of Washington DC, cruising past our Nation's monuments to Georgetown and back to beautiful, historic Old Town Alexandria. Nina's Dandy is a fine dining dinner-boat, world renowned for excellent food and service in an elegant atmosphere. Chair-rail to ceiling windows, plush carpeting, crisp linens, mahogany wood, brass accents, and marble dance floor create an Old World look. Dine while viewing the Washington Monument, Jefferson and Lincoln Memorials, the Kennedy Center, Watergate, Rosslyn, Washington Harbour, Georgetown, and many other beautiful landmarks.

Wednesday luncheon speaker - Greg Hahn



Greg Hahn has parlayed his absurdly energetic, all out style of physical humor, one liners and crowd work, into an act with no waiting for the funny, just immediate pandemonium and panic. His massive likeability and wild stylings have led to numerous television, corporate and college appearances throughout the country.

Greg Hahn is one of the hottest comedians in America. He has been featured seven times on Comedy Central, and has appeared recently on Late Night with Conan O' Brien, and Fox TV's show 30 Seconds to Fame.

Thursday luncheon speaker - John Kitching



NIST Unveils New Mini Atomic Clock

The heart of a minuscule atomic clock—believed to be 100 times smaller than any other atomic clock—has been demonstrated by NIST scientists, opening the door to atomically precise time keeping in portable, battery-powered devices for secure wireless communications, more precise navigation and other applications.

METROLOGY CALENDAR

NCSLI MEETINGS

August 7-11, 2005
NCSLI Workshop & Symposium
Hilton Washinton, Washington, DC
CONTACT: NCSL Business Office, (303) 440-3339
Fax: (303) 440-3384
e-mail: <info@ncsli.org>
website: <www.ncsli.org/conference>

August 6-10, 2006
NCSLI Workshop & Symposium
Nashville Convention Center, Nashville, TN
CONTACT: NCSL Business Office, (303) 440-3339
Fax: (303) 440-3384
e-mail: <info@ncsli.org>
website: <www.ncsli.org/conference>

REGION MEETINGS

July 28, 2005
South Texas Section
3M Austin Center, Austin, TX
CONTACT: Keith Scoggins, (361) 972-7742
Fax: 361-972-8368
Email: dkscoggins@stpegs.com

INDUSTRY MEETINGS

September 5-7, 2005
Test & Measurement 2005
Caesar's Gauteng Hotel & Conference Resort, Pretoria, S Africa
CONTACT: Steve Sidney, stevs@nla.org.za
Maggie Rossouw, maggier@nla.org.za
Website: www.nla.org.za

September 17-22, 2006
IMEKO XVIII World Congress
Rio de Janeiro, Brazil
CONTACT: Karolina Havrilla, Secretariat
P.O. Box 457, H-1371
Budapest, Hungary
website: <www.imeko.org>

November 14-16, 2006
3rd International Conference on Metrology - Trends and Applications in Calibration and Testing Laboratories
Tel Aviv, Israel
CONTACT: Dr. Henry Horowitz, Secretariat
ISAS International Seminars
P.O. Box 34001
Jerusalem, 91340 Israel
e-mail: <congress@isas.co.il>
website: <www.isas.co.il>

April 4-6, 2006
CAMET 2006
Casablanca, Morocco
CONTACT: Mohamed Lemyasser
ENIM
BP 753 Rabat
Agdal, MAROC
e-mail: <jm2006@enm.ac.m>
website: <www.acmetrology.com>

CHECK WEBSITE FOR UPDATES
<www.ncsli.org/events/>

**You can submit information on your upcoming Region/Section meeting, Committee meeting, or other Metrology-related event on the web! Just click on "Calendar" then "Submit an upcoming event".
Get listed and increase awareness and attendance!**

REPORTS FROM THE BOARD

ISO/IEC 17025:2005 PUBLISHED

Graeme Drake
CASCO Secretariat
International Organization for Standardization (ISO)

Greetings; just in case you didn't know, the new edition of ISO/IEC 17025:2005 was published on May 15, 2005.

A banner advertisement appears on the ISO public website - <http://www.iso.org/iso/en/ISOOnline.frontpage>. Please feel free to put it on the ILAC website if appropriate. It has four phases, so wait and read it as it changes...

ILAC/NACLA REPORT

Anthony Anderson

International Laboratory Accreditation Cooperation (ILAC) Laboratory Committee (LC)

In February, I attended the ILAC LC meeting in Paris and immediately afterwards the ILAC Executive meeting. Both meetings were held at the French accrediting body (Cofrac) facilities. The main item on the LC agenda was the issue regarding a statement on accreditation, calibration and test certificates about meeting the principles of ISO 9001:2000. As I reported in January, this issue, after being discussed by the Joint ISO/ILAC/IAF working group last November, has been referred back to ILAC for further deliberation. The LC debated the new language, which had been prepared by the chair, and it was approved for submission to the Executive, where it was on the agenda later in the week for an ILAC decision.

Proficiency Testing issues were again discussed by the LC. At the previous meeting in Cape Town, the LC had indicated to the ILAC Executive that it wanted to take a proactive role in PT issues. One suggestion had been to form a sub committee of the LC for PT providers. Following the Cape Town General Assembly (GA), a white paper on PT issues has been prepared for the Executive to consider. It does not include the LC Sub Committee option, but the LC supports the ideas contained in the paper and is willing to take an active role in whatever forum eventually is agreed for PT issues within ILAC.

On a parallel issue, the subject of accreditation of reference material providers continues to be discussed within the LC and ILAC in general. In Cape Town the GA adopted two resolutions with regard to accreditation of reference material providers.

Firstly: that assessing the technical competence of bodies producing reference materials with assigned values is accreditation of a conformity assessment activity.

And secondly: accreditation of technically competent bodies producing reference materials with assigned values will be conducted against harmonized criteria based on ISO Guide 34 and ISO/IEC 17025 in combination.

The LC supports the ILAC resolutions from Cape Town. The activity of producing the samples and the associated testing activities for sample characterization, stability, and homogeneity are seen by the LC as an integrated activity requiring accreditation.

On February 9, 2005 the ballot closed for the adoption of the amendment to ISO/IEC 17025. It received a 96% approval, and it is expected to be published as ISO/IEC 17025: 2005 in June. Laboratories will have two years to become compliant with the amended standard. At the ILAC Executive meeting, the LC reminded ILAC that there is the need to promote the publication of the new ISO/IEC 17025:2005 as being an amendment rather than a new standard. The LC feels that it needs to be clear to laboratories that ISO/IEC 17025 has only been amended slightly and that there is no cause for concern or panic. The LC feels that this can best be achieved by the preparation of a comparison document, which clearly highlights the changes, and also by advertising this fact, perhaps in ILAC News and on the ILAC website.

The issue regarding a statement on accreditation, calibration and test certificates about meeting the principles of ISO 9001:2000 was discussed by the ILAC Executive following the LC meeting. I am happy to report that the compromise worked out following the joint ISO/ILAC/IAF meeting in Amsterdam was accepted by the Executive with a minor change in wording and has been sent back to ISO and IAF for their concurrence. The use of the language that has been agreed upon will not be mandatory but accreditation bodies will have the option to include it on the certificate of accreditation (attestation) if requested to do so by a laboratory.

As has been reported before, in the Madrid Protocol countries, of which the US is one, the ILAC MRA Mark has been registered. Laboratories need to contact their AB's, if an ILAC signatory, to obtain a sub-license for its use. For countries not part of the Madrid Protocol the registration process continues.

The next Executive meeting of ILAC will be in Frankfurt in June and the next LC meeting will be in Auckland, New Zealand in September during ILAC 2005.

National Cooperation for Laboratory Accreditation (NACLA)

I attended the NACLA Annual Forum, AGM and Board meeting in Columbia, Maryland earlier this month. The Forum agenda included several presentations on the new ISO/IEC 17011:2004 standard, "*Conformity assessment - General requirements for accreditation bodies accrediting conformity assessment bodies.*" Emphasis was made of the new requirements that demand impartiality both in the verification of competence and an AB's relations with conformity assessment bodies (CABs) and CAB's clients. An AB cannot provide both conformity assessment services and consultancy. The witness of performance of laboratory staff must now assure competence across the full desired scope. Proficiency testing requirements for laboratories have been strengthened in the new standard. ILAC requires that ABs conform by January 1, 2006, and NACLA has implemented the same time frame for its recognized and applicant ABs. Signatories to the NACLA MRA must conduct a 17011 internal audit and management review, and provide to NACLA documentation of this review, before the deadline.

Reports from the Board

Another critical issue from the new standard is the definition of accreditation itself. From ISO/IEC 17000:2004 "*Conformity assessment - Vocabulary & general principles*," accreditation is third party attestation related to a conformity assessment body demonstrating competence to carry out specific conformity assessment tasks. Accreditation only relates to **attestation** of CABs by ABs and is not applicable to the certification of persons.

Other topics covered at the Forum included an update on ISO/IEC 17025, Interaction of Calibration and Testing Laboratories, Assessor Training, DoE/NNSA Experience with Accreditation and the importance of PT Programs in Laboratory Accreditation.

On the second day, presentations focused on NACLA issues including the NACLA/IAAC MoU, the latest version of the NACLA Recognition Procedure, Revision F, and the NACLA MRA. The Forum was followed by the NACLA AGM, where reports were presented by the President on the state of NACLA, and the Treasurer presented the financial report for fiscal 2004. In NACLA's first year of operations without any sponsorship from NIST, the organization broke even. After some lively interchange between the membership and the Board of Directors, the overall impression was that, while still needing improvement, NACLA is heading in the right direction and that the Forum had been well received.

The NACLA Board of Directors meeting was held immediately before and after the Forum/AGM. The recommendations of the MRA task group, formed at the last meeting to review the MRA language, were adopted by the Board pending review by the Recognition Committee. It should be emphasized that the new language, which has been added, is to clarify certain parts of the MRA, while maintaining its principles. All the signatories to the MRA have already agreed to the language clarification and changes.

At the request of A2LA, the Board met in Executive session with representatives from the organization. Both parties felt that the meeting was a success and the ground has been laid to move forward and hopefully enable A2LA to rejoin the MRA. A2LA expressed its continued commitment to be a member of NACLA and participate in the organization. This was amply demonstrated by presentations made at the Forum by some of their staff, which was much appreciated by NACLA.

The next NACLA Board meeting will be just prior to the NCSL International Conference in Washington, DC, on August 5 & 6, 2005, at the Washington Hilton & Towers.

WORLD METROLOGY DAY: 20 MAY 2005.

Andrew Wallard, Director, BIPM

"Global Confidence Through SI Traceability"

Editor's Note: It seems that World Metrology Day is a bigger event globally than in the U.S. In recognizing that fact, NCSLI will be working in 2006 to take more note of that important day. Meantime, Andrew Wallard's BIPM organization published this important recognition of an event we all should be interested in promoting to the general public and the technical community.

On 20 May 1875, 17 States became the founding Members of the Metre Convention. The Convention is the second oldest intergov-

ernmental treaty arrangement and set the scene for what is now 130 years of achievement and success in the establishment of a global infrastructure for precise, accurate and traceable measurement. Today there are 51 Members of the Convention and 17 Associate States and Economies of the General Conference on Weights and Measures. The first members of the Convention and the staff of the Bureau International des Poids et Mesures (BIPM) started with the metre and the kilogram as reference standards. However the work of the Convention now extends to a much greater number of international measurement standards and is making its presence felt in fields as diverse as biological standards and nanotechnologies.

We celebrate May 20th as a day on which metrologists can be proud of their quiet, largely unseen, but influential achievements. They can look back on a successful past, and look forward to another 130 or more years of service to the scientific, technical, commercial, and social applications of precise, traceable measurements within the International System of units (SI).

This message from the BIPM, which is at the heart of world metrology, is a challenge to, as well as recognition of, the immense contributions of many thousands of metrologists throughout the world. It also aims at drawing the attention of Governments from our Member States and others, as well as international bodies, to the benefits of good metrology and the very large economic benefits which come from their investments. Many studies have shown a clear and very large techno-economic benefit from public investments in metrology. One recent UK study put the return from their £40 million national investment at over £5000 million! Similar figures apply to economies of all sizes and stages of economic development. The benefits of metrology touch us all, wherever we live and whatever we do.

Metrology is the science of measurement, and embraces both experimental and theoretical measurements and determinations at any level of uncertainty in any field of science and technology. The intricate and mostly invisible networks of services, suppliers and communications upon which we are all dependent rely on metrology for their efficient and reliable operation.

The economic success of nations depends upon our ability to manufacture and trade precisely measured and tested products and services. Metrology is central to the manufacturers, suppliers and customers of goods and services. All groups must have confidence in the accuracy and reliability of the measurements made at every level of precision.

A current example of this international standardization of metrology is the construction of the European Airbus A380, parts of which are made in the UK, in Spain, in Germany, in France, and are transported to France for assembly. To achieve this goal, precision position measurements over a 50-metre stretch were needed to the amazing and challenging target of about 50 micrometres. This was laboratory technology until the very recent past, and even now challenges the very best laser trackers. Such international commercial collaboration and product quality would be impossible without accurate validated dimensional measurements between the various national metrology institutes and laboratories of the countries involved.

Apart from areas of engineering, measurement science has profound implications in a number of other areas of science and technology. In the domain of measurements of time, satellite navigation systems and international time coordination make accurate location possible

- allowing the worldwide networking of computer systems, and permitting aircraft to land in poor visibility. The new Galileo consortium is working to ensure that "Galileo time" is consistent with the Coordinated Universal Time produced by the BIPM from over 300 atomic clocks in 41 countries.

The maintenance of human health depends critically on the ability to make accurate diagnosis, and deliver precise treatment in which reliable measurement is essential. This also supports an industry worth hundreds of billions of dollars worldwide. For many years we have focussed on radiation dosimetry and radionuclide activity measurements and we continue to improve the uncertainties in the dissemination of the international reference standards for radiotherapy measurements in particular. This is challenging and every small improvement has a direct and beneficial effect on the safety and care of patients who are treated in millions of hospitals in all countries of the world.

We have recently broken new ground working with the International Federation of Clinical Chemistry, the International Laboratory Accreditation Cooperation and the World Health Organisation in the development of an infrastructure of consistent and traceable measurements in laboratory medicine. This will have profound implications for accurate diagnosis and health monitoring for us all, whether we stay at home but especially as we travel.

The ability to make accurate measurements, traceable to fundamental standards of parameters important in monitoring environmental science is essential in monitoring air quality and changes in the environment such as global warming and climate change. These are areas where we rely on metrology to take sound and reliable decisions which affect us all. We are working with the World Meteorological Organisation and its worldwide Global Atmosphere Watch programme to deliver traceable references for these hugely important issues for our future and the future of our planet

Metrologists working in different areas specialize in different types of measurements. At the highest scientific level, metrologists ensure the consistency of the International System of Units, which built on the early units of the Metric System and which was formally created in 1960. Their work usually involves research into the definitions of the units and ways of realizing them with sufficient accuracy to meet the needs of society and the world of scientific research. Legal metrologists are involved in aspects of metrology in the regulated sector, which directly concern consumers. Both metrologies are essential in ensuring consistent national measurement systems, traceable to international standards; thereby establishing that measurements and tests made in different countries can be regarded as equivalent.

The maintenance of the world's system of units takes many forms, from direct dissemination of units (as in the case of mass and time) to coordination through international comparisons of national measurement standards (as in length, electricity and ionizing radiation). Such comparisons are coordinated by the International Committee for Weights and Measures, the CIPM.

The creation in 1999 of the CIPM Mutual Recognition Arrangement (MRA) marked a major advance in the internationalization of metrology. A means of increasing confidence in the technical abilities of participants from laboratories around the world to make equivalent measurements and enable the provision of calibration certificates that are validated, verified and accepted by all signatories represents a

significant contribution to the reduction of technical barriers to trade.

Some people claim that the CIPM MRA is as influential as the Metre Convention itself. Time will tell, but it is clear that metrologists are actively involved in practical research to produce results which bring potentially huge benefits to society at large. One recent estimate is that the impact of the CIPM MRA in reducing technical barriers to trade is worth over \$4 billion.

The reason for the increasing importance of metrology is the turbulence associated with globalization and global trade. For an economy to prosper in the global market place, it must improve the international competitiveness of its manufacturing industry. This requires more than simply the production of better products at lower prices; the potential customer also needs to be convinced of the quality and compliance of the product, which must be proven by reliable test reports and conformity assessments.

To achieve all this, a continuous upgrading of technology and expertise is needed. Typically the accuracy required of national measurement standards doubles every ten years. This demand for increasing precision and uniformity applies not only to national standards but also to the implementation of quality systems based on international standards. For example, the ISO/IEC 17025 quality standards require that all measuring instruments used for production or service are calibrated; where calibration means the comparison of the instrument's measurements with standards or reference materials of known value.

Where are the important areas for metrology for the future? Certainly, there will continue to be a range of challenges from the traditional areas of physics and engineering. However, the greatest and most pressing demand currently is from chemistry and chemistry-based sciences. Here there is an urgent need for precise, traceable measurements. Our long-term aim is to bring these domains into the framework of the CIPM MRA or a similar arrangement, in order to continue our mission of seeking worldwide uniformity in measurement.

The international work of the BIPM demonstrates that the Metre Convention is still a living instrument, responsive to the current needs of globalization. This is a testament to the sagacity of those who met in Paris in May 1875. The adventure of metrology is an enterprise which has been propelling the evolution of the modern world and which continues to excite the imagination and to assist society. <http://www.bipm.fr/en/practical_info/faq/welcome.html>

NCSLI V. P. Georgia Harris notes that, "We should take action to participate in and promote "World Metrology Day" on May 20 on a regular yearly basis. It is consistent with a number of actions we are working on with Marketing and with Education & Training objectives.

<http://www.npl.co.uk/scienceyear/world_metrology_day/>
 <<http://metrologyforum.tm.agilent.com/news20000520.shtml>>
 <<http://www.nml.csir.co.za/news/20010517/20010517articles.htm#w>>
 <<http://www.learningalive.co.uk/lapages/topical/MeasureUp.html>>
 <http://www.nmij.jp/apmp/apmp_en/newsletter/n21-p02.htm>

(Continued on page 44)

EDUCATOR'S CORNER

Christopher L. Grachanen

In this issue of the Educators Corner we will be highlighting a Metrology education program that has moved forward a very long way in a very short time.

CENTRAL GEORGIA TECHNICAL COLLEGE - METROLOGY PROGRAM



The CGTC came to fruition through the cooperation of a group of industrial and government organizations, to serve as a supplier of metrology-trained personnel.

Welcome to Central Georgia Tech

Central Georgia Technical College's (CGTC) Metrology program was developed in 2000 in response to a request from the Air Logistic Center located at Robins Air Force Base in Warner Robins, Georgia. The Precision Measurement Equipment Lab (PMEL) was having difficulty recruiting qualified Calibration Technicians.

CGTC staff and Robins personnel worked together to develop a plan to implement the Metrology program. To keep current with the latest trends, CGTC formed a Metrology Program Advisory Committee including representatives from Boeing, Robins Air Force Base, Certified Measurements Inc., Georgia Power, Raytheon Missile Systems, Kay and Associates, Northrop-Grumman and Southern Marketing Associates.

Central Georgia Technical College offers Associate Degrees and Diplomas in Metrology, Technical Certificates of Credit in Electrical and Physical Metrology, ISO-9000 Quality Systems and a Certified Calibration Technician Certificate. These programs are available on the Macon campus or online. Students participating in the on-line courses must have access to a laboratory to complete the hands-on course requirements.

CGTC **Metrology Associate Degree** program is designed to meet the precision measurement needs of industry by preparing graduates through both theoretical and hands-on laboratory work to successfully enter the work force. The emphasis of this program is Physical and Electrical Dimensional Metrology.

Metrology Associate Degree	Credit Hours
General Core Courses	35
<i>Area I - Humanities/Fine Arts</i>	
ENG 191 Composition and Rhetoric I	5
HUM 191 Introduction to Humanities	5
SPC 191 Fundamentals of Speech	5

Area II - Social/Behavioral Sciences

ECO 191 Principles of Economics	5
OR	
ECO 193 Macroeconomics	5
PSY 191 Introductory Psychology	5

Area III - Natural Sciences/Mathematics

MAT 191 College Algebra	5
PSC 150 Applied Physical Science	5

Occupational Courses

IFC 100 Industrial Maintenance Safety Procedures	2
IFC 101 Direct Current Circuits I	4
IFC 102 Alternating Current I	4
IFC 103 Solid State Devices	4
IMT 102 Problem Solving in Technology	4
SCT 100 Introduction to Microcomputers	4
MTR 101 Introduction to Quality Systems	2
MTR 111 Introduction to Measurement Technology	2
MTR 121 Standards and Traceability	2
MTR 131 Metrology Electronics I	4
MTR 132 Metrology Electronics II	4
MTR 141 Statistical Quality Control	3
MTR 161 Physical Metrology I	4
MTR 171 Dimensional Metrology	4
MTR 162 Physical Metrology II	4
MTR 163 Physical Metrology III	2
MTR 201 Advanced Physical Dimensioning Metrology	4
MTR 211 Electrical Metrology I	4
MTR 212 Electrical Metrology II	4
MTR 213 Electrical Metrology III	4
MTR 221 Automated Metrology	4
Total Hours	107



CGTC training philosophy depends on hands-on experience, especially for the on-line training processes.

CGTC **Certified Calibration Technician Certificate** program is designed to introduce the history of national and international quality standards, core opportunities, safety, basic AC-DC theory and application, statistical analysis, dimensional measurements and other measurement disciplines.

Certified Calibration Technician Certificate	Credit Hours
MTR 101 Introduction to Quality Systems	2
MTR 111 Introduction to Measurement Technology	2
MTR 131 Metrology Electronics I	4
MTR 141 Statistical Quality Control	3
MTR 161 Physical Metrology I	4
MAT 103 Algebraic Concepts	5

MAT 104	Geometry and Trigonometry	5
PSC 150	Applied Physical Science	5
Total Hours		30

CGTC **Electrical Metrology Certificate** program is designed to introduce the student to many devices and circuits commonly used in instrumentation. The focus will be topics such as voltage, standard resistors, capacitors, frequency and frequency conductors, and spectrum analysis.

Electrical Metrology Certificate		Credit Hours
MTR 101	Introduction to Quality Systems	2
MTR 111	Introduction to Measurement Technology	2
MTR 131	Metrology Electronics I	4
MTR 132	Metrology Electronics II	4
MAT 103	Algebraic Concepts	5
MAT 104	Geometry and Trigonometry	5
PSC 150	Applied Physical Science	5
SCT 100	Introduction to Microcomputers	3
Total Hours		30

CGTC **ISO-9000 Quality Systems Technical Certificate** is designed to offer students training in the process of obtaining ISO 9000 certification for their respective companies. This 17-credit hour technical certificate provides instructions in the benefits of ISO 9000 certification and registration, elements of the ISO-9000 quality standard, the auditing process, the registration process, and documentation procedures.

ISO-9000 Quality Systems Technical Certificate		Credit Hours
IMT 102	Problem Solving Techniques	4
MTR 101	Introduction to Quality Systems ISO 9000	2
MTR 111	Introduction to Measurement Techniques	2
MTR 121	Standards & Traceability ISO 9000	2
MTR 161	Physical Metrology I	4
SCT 100	Introduction to Microcomputers	3
Total Hours		17

CGTC **Physical Metrology Certificate** program is designed to offer students an introductory study of physical measurements (temperature, mass, force, pressure, vacuum, volume, flow, density, etc.) and measuring instruments emphasizing the theory and proper use of equipment and thorough knowledge of laboratory technique.

Physical Metrology Certificate		Credit Hours
MTR 111	Introduction to Measurement Technology	2
MTR 121	Standards and Traceability	2
SCT 100	Introduction to Microcomputers	3
MTR 161	Physical Metrology I	4
MTR 162	Physical Metrology II	4
MAT 103	Algebraic Concepts	5
MAT 104	Geometry and Trigonometry	5
PSC 150	Applied Physical Science	5
Total Hours		30

In the spring of 2005, CGTC hosted a meeting of the Atlanta Section of NCSLI. As one of the speakers, Ms. Georgia Harris (NIST), NCSLI's Vice-President for Education, discussed the availability of Metrology training and the need for trained Metrologists throughout industry. Randall Francis, CGTC's Metrology instructor, provided an excellent curriculum overview and led a tour of CGTC's Metrology laboratory.

Central Georgia Technical College offers courses at several locations throughout the central Georgia area. Seven counties are served by two campuses—one in Macon and one in Milledgeville—and four centers. CGTC is a member of Georgia's Department of Technical

and Adult Education. CGTC is fully accredited by the Southern Association of Colleges and Schools-Council on Colleges (SACS-COC) to grant Associates Degrees and is approved by the Veteran's Administration to provide educational opportunities for veterans.

Additional information on Central Georgia Technical College's Metrology Program may be found at <http://www.centralgatech.edu/catalog/section6/te.htm#metrology>. You may contact Tony Abel, program chair at 478-757-3637 or tabel@centralgatech.edu.

NATIONAL INSTRUMENTS / CHRIS GRACHANEN METROLOGY SCHOLARSHIP

Tidewater Community College

Description

Established in January 2005 by National Instruments Company. This scholarship's goal is to attract students into curricula that will prepare them to enter the metrology field in order to alleviate a shortage of trained Metrologists.

Criteria

- Must be or must have been a TCC student in good standing during the year immediately preceding the award.
 - Must be specializing in either mechanical or electronic metrology.
 - Must have a cumulative grade point average at TCC of at least 2.500.
 - Must have completed at least 32 credits toward the AAS degree with a specialization in Mechanical or Electronic Metrology.
 - Must submit a typed original essay describing his/her reasons for studying metrology and the anticipated benefits of the metrology curriculum. Optional additional topics include past experience in metrology, future and present career plans in metrology, and the importance of measurement expertise in industry. The essay is to be submitted to the Dean of Engineering and Industrial Technology at the Virginia Beach Campus after announcement, typically in the Fall semester, and prior to the middle of the following semester. The scholarship will typically be awarded in February.
 - May be required by the scholarship committee to be interviewed for selection from among finalists. The scholarship committee determines by consensus whether or not to hold interviews.
 - Award Amount: Selected recipients will receive an award of \$1,000.00 to either be applied toward future courses taken toward the AAS degree or as reimbursement for courses completed that lead to the metrology specialization.
 - The recipient must send an acknowledgment letter to National Instruments and another letter to Mr. Chris Grachanen through the Development Office at the time of award. Original letters should be sent to Tidewater Community College, PO Box 3575, Norfolk, VA 23514-9887. The Development Office will distribute the letters.
- <http://www.tcc.edu/students/admissions/scholarships/vabeach.htm>

Editor's Note: There aren't many of us who have scholarships named after us in our lifetime. This one was established from a technical prize that Chris won from T&M Magazine, funded by National Instruments.

TRAINING INFORMATION

PRINCIPLES OF METROLOGY

Fluke Corporation
<www.fluke.com/2005caltraining>
<caltraining@fluke.com>
(425) 446-6330

July 18-22 NCSLI Training Center, Boulder, CO

\$2495 per student. This five-day in-depth workshop offers extensive hands-on time on a wide range of instruments. The course covers all aspects of dc / low frequency electrical/electronic measurements and calibration. Participants will become more productive in calibrating test instrumentation. Topics Include:

- Evaluating and calculating measurement system uncertainty
- Loading errors and how to predict and avoid them
- w Lead impedance and when to be concerned
- Low level measurements
- Thermal EMFs and how to avoid them
- Grounding and guarding, when to use and why
- Laboratory tools, such as bridges, null detectors and dividers

A full complement of calibration equipment is available to allow each student to perform several measurement exercises to exemplify the principles and techniques covered in the discussion sessions. Included are some exercises which represent methods of extending traceability to measurement and calibration levels that otherwise cannot be obtained. The purpose of these exercises is to stimulate the student's thinking beyond the limits generally constrained by calibration procedures.

QUAMETEC. CORP.

Measurement Uncertainty Class

Karen Moor, (810) 22507577
<info@quametec.com>
<www.quametec.com>

July 18-20 Hosted by QC Inspection, Minneapolis, MN
August 22-24 Hosted by QC Inspection, Schaumburg, IL
September 19-21 Harrisburg, PA
October 17-19 Dallas, TX

\$1395 per student. Attendees will receive 3 days of hands-on Measurement Uncertainty training based on the GUM Method, plus a copy of our book, "Measurement Uncertainty Analysis Fundamentals" and a licensed copy of our software, "Uncertainty Toolbox for Microsoft Excel" developed by Quametec. See our website at www.quametec.com for additional information and our unique class guarantee.

Managing Your Uncertainties (New Class)

November, 2005 Detroit, MI

\$1195 per student. Attendees will receive 2 days of hands-on training PLUS a licensed copy of "Measurement Uncertainty Manager" for Microsoft Access. One of the biggest challenges facing those tasked with calculating their laboratories required measurement

uncertainties is first identifying all the measurements needing uncertainty estimates and then linking the estimates to the data reports. To assist laboratories in this requirement, Quametec is developing a software database tool using Microsoft Access 2000 called "Measurement Uncertainty Manager". This tool will become available for purchase in 2004. In order to support the proper use of this tool, we are offering a 2-day class immediately following our 3-day Measurement Uncertainty Class on specific dates.

CRYOGENIC ENGINEERING TRAINING

Dr. Thomas Flynn
(303) 665-8302 FAX(303) 665-0222
<thomasmflynn@comcast.net>
Syllabus and registration forms at: <www.cryoco.com>
25-28, 2005 Boulder, CO

Short course: Four full days, includes: Basic Principles, Properties of Cryogenic Fluids, Properties of Solids at Low Temperatures, Refrigeration and Liquefaction, Cryogenic Instrumentation, Cryogenic Equipment and Systems, and Cryogenic Safety.

NIST LASER MEASUREMENTS SHORT COURSE

Contact: Marla Dowell
Phone: 303.497.7455 Fax: 303.497.7454
Email: <marla.dowell@nist.gov>
Registration Web Page:
<<http://www.boulder.nist.gov/div815/lmsc/Registration.htm>>

August 9-12, 2005 NIST, Boulder, CO

The National Institute of Standards and Technology will offer a Short Course in Laser Measurements in Boulder, Colorado, August 9-12, 2005. The three-and-one-half-day course will emphasize the concepts, techniques, and apparatus used in measuring laser parameters and will include a visit to NIST laser measurement laboratories. The most comprehensive seminar of its type, this course is ideal for those who need to understand the characteristics of lasers and laser measurements or who are responsible for laser systems. The seminar is taught by laser experts from NIST, industry, and other government agencies and is intended to meet the needs of metrologists, scientists, engineers, laboratory technicians, educators, managers, and planners involved in the use of laser systems. A degree in physics or engineering or equivalent experience is assumed, and some experience in the use of lasers is desirable.

UNCERTAINTY/SPC ANALYSIS

Integrated Sciences Group
1-800-400-7866
<training@isgmax.com>

Sep 19-22 NCSLI Training Center, Boulder, CO

\$1,895 per student. This four-day course provides straightforward

and easy-to-understand principles of measurement uncertainty analysis. Concepts and methods are consistent with those found in ANSI/NCCL Z540-2, the "U.S. Guide to the Expression of Uncertainty in Measurement." Advanced measurement uncertainty analysis topics are also presented that extend these methods and concepts. Hands-on analyses using ISG's UncertaintyAnalyzer software provide practical application of important concepts to the development of uncertainty estimates for direct measurements, multivariate measurements and measurement systems.

TIME AND FREQUENCY: MEASUREMENTS AND APPLICATIONS

Michael Lombardi
 Phone: 303-497-3212 Fax: 303-497-3228
 Email: <lombardi@boulder.nist.gov>
 Registration Web Page: <<http://www.ncsl.org/>>
October 5-6, 2005 NCSLI Training Center, Boulder, CO

This comprehensive, two-day seminar serves as an excellent introduction to the field of time and frequency metrology. It is intended for anyone who makes time and frequency related measurements in a metrology or engineering setting, or is who involved in any application involving precise frequency and time information.

- History of Time and Frequency
- Time and Frequency Terminology
- Fundamentals of Time and Frequency Measurements and Calibrations
- Stop Watch and Timer Calibrations
- Network and Wireless Time Synchronization
- Frequency Standards (Quartz, Rubidium, and Cesium)
- Global Positioning System (GPS) Receivers
- Traceability and Legal Metrology
- Time Domain Stability and Noise Analysis
- Phase Locked (PLL) and Frequency Locked Loops (FLL)
- Measurement Uncertainty Analysis
- Time and Frequency Related Instrumentation

BLUE MOUNTAIN QUALITY RESOURCES, INC. & ECALIBRATION.COM

Calibration Program Fundamentals & Best Practices

September 19 - 20, 2005 in Cambridge, MA
 October 19 - 20, 2005 in Northbrook, IL
 November 16 - 17, 2005 in Las Vegas, NV

\$1,200.00 per student. Ralph Bertermann continues to share his knowledge and expertise as the instructor for this class. A successful calibration program within a corporation does not operate alone but rather it must interact with management, users, quality assurance departments and regulatory affairs. The development of an effective calibration program relies upon cooperation among these groups. Whether you have experience in the calibration field or have recently acquired calibration responsibilities, this course will provide you with the knowledge and understanding of the fundamentals of an effective calibration laboratory program in the drug, medical device and biotech industries.

<<http://www.ecalibration.com/ecalibration/TrainingClasses/gencal-training.htm>>

Analytical Metrology

September 13 - 14, 2005 in Cambridge, MA
 November 14 - 15, 2005 in Las Vegas, NV

\$1,200.00 per student. Michael Bird formerly presented this course along with Lighthouse Training Group. This two-day seminar includes such topics as Spectroscopy (HPLC and Spectrophotometry), Optics and Chemistry Lab Metrology. The course includes discussions on pH, conductivity, viscometry, polarimetry, particulate and biological air sampling, density, titrimetry, and pipettes. The software used in pipette calibration and other indirect measurements will be explored. USP's role in determining tests points, tolerances and uncertainties will be discussed. The question of traceability from derived and consensus standards as well as establishing "a priori" traceability through natural physical constants will be covered. Validation of laboratory equipment, instrument specifications and ISO/IEC 17025 will also be covered.

<http://www.ecalibration.com/ecalibration/TrainingClasses/analytical_met.htm>

For more information call 800-982-2388 or visit:

<<http://www.ecalibration.com/ecalibration/TrainingClasses/trainingindex.htm> >

CHECK WEBSITE FOR UPDATES
 <www.ncsl.org/training/>

NMI TRAINING INFORMATION

The NCSLI website contains additional information regarding training courses offered by the **National Institutes of Measurement**, such as NIST and CENAM. Click "Training" in the left-hand column, then "NMI Training Programs."

NCSLI TRAINING INFORMATION DIRECTORY

See the "Training Information Directory" on the NCSLI website to search for training offered by our member organizations.

Member Delegates (of corporate memberships) can **post related training materials** on the NCSLI website. Click on "Training Information Directory", then "Add/Update Resources" and follow the steps.

Please send Training Information additions and corrections to the NCSL International Business Office, (303) 440-3339 FAX:(303) 440-3384, or E-mail to <info@ncsl.org>

SOMEONE YOU SHOULD KNOW



Jack Ferris, NCSLI Treasurer

Our Treasurer, Jack Ferris, first became active in NCSLI with the Utilities Committee in 1987. He was then asked to serve as the utility representative on the Gary Davidson's TQM committee on calibration requirements when the committee was formed. He was actively involved with the development of NCSLI's first American National Standard Z540-1, 1994.

He served as Vice Chairman of the Z540 committee until Gary Davidson's resignation in 1994 when he became Chairman and served until late 1997. During that period he also served on the writing committee that prepared ANSI/NCSL Z540-2. He continues to be active in ANSI / NCSLI Accredited Standards Writing committee activities.

For all that exemplary work on that inter-industry activity, Jack was elected to the NCSLI Board of Directors in 2000 and has served as the Vice President for Industrial Programs, Vice President for Standards Policy and currently serves as Treasurer.

Jack is employed by Consumers Energy, an investor-owned electric and gas utility in Michigan. He is currently responsible for the calibration and repair of metering, protection, telemetry, voltage regulation and control systems in all of the electric substations and generating plants in the northern half of Michigan's Lower Peninsula. He also oversees the commissioning of new and modified electric facilities.

He was previously manager of the metrology laboratory for Consumers Energy in Jackson, Michigan. He also served as Sales and Marketing Manager for Laboratory Commercial Services, the Consumers Laboratory commercial arm. Jack also is the President of Sleeping Bear Metrology, a consulting firm providing metrology consulting located in Glen Arbor, Michigan. As with many of our member delegates, his first exposure to metrology was in the U.S. Air Force with their PMEL program. He is a graduate of Muskegon Community College with an AS in Electronic / Electrical Technology and of Spring Arbor College with a BS in Business Administration.

Jack has also served as chairman of the Standards Coordinating Task Force for the Edison Electric Institute. He is a member of IEEE and served on the IEEE 498 committee. He is a former member of the ASME B89.5 Standards Committee on dimensional measurement.

Jack resides in Glen Arbor, Michigan where he also operates a marina and boat rental business. Jack also served as EMS Director for Glen Arbor Fire and EMS and is a licensed EMT Specialist in Michigan. He was an elected member of the Board of Education for the Napoleon Community Schools near Jackson, Michigan, for fourteen years and served as President for eleven of those years. He is a Past Commander of the Irish Hills Power Squadron. He holds a private pilot's license and is a recreational golfer and sailor. He has two grown sons and a seventeen-month-old grandson.

Editor's Note: Jack gives a whole new meaning to the word "multi-tasking."

REPORTS FROM THE REGIONS



March 10, 2005
Hamilton Sunstrand
Windsor Locks, CT
Phil Noll,
NorthEast Section Coordinator

The NCSL International Northeast Section Region 1110 spring meeting was held at Hamilton Sundstrand (HS) in Windsor Locks, CT, on Mar 10, 2005. Phil Noll, the North East Section Coordinator and Principal Engineer at HS conducted the meeting. All who attended applauded the meeting as a great success, drawing metrology professionals from not only New England but also Long Island and upstate New York.

This year it was our section's privilege to also be chosen to host the spring 2005 NCSL Uncertainty Road Show. Of particular interest to all attendees, Jim Salisbury (Mitutoyo), Karl Kurtz (DH Instruments), Tom Wiandt (Hart Scientific) and Warren Lewis (Sandia Laboratory) enlightened the crowd on uncertainty calculation as it pertained to each presenter's discipline.

In addition, Lonnie Spires (NCSLI Division V.P. N.E) presented a report highlighting the latest NCSLI Board of Directors minutes. Lonnie highlighted the boulder training facility while briefly reporting on national and international news. He also presented the status on working groups such as Z-540 and 17025 rewrites. In addition, Lonnie outlined a full calendar of upcoming events, including Washington this summer

Jim Salisbury, PhD, provided two presentations. During the morning session he provided an excellent base line for the rest of the day by outlining a general "Introduction to Measurement Uncertainty." Using general guidelines for uncertainty analysis, Jim took us through the simple topic; "What time is it?" In logical progression, Jim introduced both uncertainty terminology and how the data should be treated mathematically. Jim's afternoon session provided insight into applying these techniques directly to dimensional metrology.

Karl Kurtz reviewed techniques for interpreting the error associated with pressure measurement. By introducing sources of error such as setup, operator and other environmental influences, Karl presented the nuances of uncertainty in the "pressure measurement world." He then tied everything together by providing a specific example for calculating the Uncertainty Analysis for a DHI PG dead weight tester.

During the afternoon session, Tom Wiandt provided insight into the methodology for calculating the uncertainties of temperature measurement. By including all evident sources of error such as bath immersion, readout, check standard, etc., Tom created a complex uncertainty budget for the resulting measurement. Using this information, he provided a simple approach for calculating the uncertainty of the measurement.

Warren Lewis (Sandia Labs) gave the final presentation. Mr. Lewis provided an in-depth "Uncertainty Analysis Case Study on an Automatic Resistance Measuring System" that had been developed at Sandia National Laboratory. Step by step, Warren led us through his interpretation of test setup, instrument uncertainties, mathematical modeling and data analysis of the process. This method resulted in a complete uncertainty analysis of the measuring system.

A fall meeting will be scheduled, hopefully to be located in the eastern part of Massachusetts enabling more attendance from the Boston area members.

Following the meeting, we conducted a tour of the Hamilton Sundstrand Space Land and Sea facility.



This large attendance is clearly a result of good section planning and excellent speakers and topics. Kudos and 5 Attaboys to those involved.



Uncertainty tutorials continue to be prime content for region meetings across the country and world.

Reports from the Regions

Attendees:

Bill Albert	Agilent Technologies
Parrott, Julius	Allegro Micro
Aleksandar Chevreviski	Allegro Microsystems, Inc
Larry Carrier	Allegro Microsystems, Inc
Tony Giannasca	Analog Inst
David Bohnsack	Artel Inc.
Doreen Rumery	Artel Inc.
George Rodrigues	Artel Inc.
John Bradshaw	Artel Inc.
Bruce Shoyer	Calibrated Instruments, Inc.
Barry Little	CSC Force Measurement, Inc
Jim Irwin	CSC Force Measurement, Inc
John Glynn	CSC Force Measurement, Inc
Tom Murray	CSC Force Measurement, Inc
Jagdish Mistry	Datascope
Don Bansen	Dayton T. Brown, Inc.
Jeffrey Cann	Dayton T. Brown, Inc.
Mary Alice Der Aris	Dayton T. Brown, Inc.
Karl Kurtz	DHI
Bob Bymes	Dominion Nuclear
Steve Kimball	Dominion Nuclear
Lonnie Spires	Dynamic Technology, Inc
William Vidal III	EB Metrology
Chuck Gunn	Fluke Inc
Steve Griffen	Fluke Inc
Paul DiBara	Genzyme Corporation
Joe Fournier	Genzyme Corporation
John Joyce	Genzyme Corporation
Roland Provost	Genzyme Corporation
Jun Bautista	Genzyme Corporation
Dan Hall	Hall Associates
Tom Wiandt	Fluke, Hart
Rich Gajdowski	HS Bldg 4
Peter S. Grant	HS Electronica
David Dubner	HS Overhaul & repair
Jeff Plugis	Humidity Systems, Inc.
Scott Sabourin	ISOTECH North America
John Masiello	MASY SYSTEMS, Inc
Kieth Kelly	MASY SYSTEMS, Inc
Robert Perry	MASY SYSTEMS, Inc
John Brower	MCS Calibration
Jim Salsbury	Mitutoyo
Rick Hodsdon	Northeast Marketing
Ronald O. Daubach, Ph.D	OSRAM SYLVANIA
Howard Maxim	QC Services, Inc.
Richard Schieferstein	QC Services, Inc.
Richard A. Berry Jr.	Quad Tech
Dominic Mallozzi	Raytheon
Warren Lewis	Sandia Laboratory
Bill Kozky	Teradyne.com
Larry Schrecengost	Teradyne.com
Thomas A. Conway	Teradyne.com
Eric Chavier	Texas Instruments
Howard Spader	Texas Instruments
Ritesh K Seal	Texas Instruments
Paul Stromquist	Watson Laboratorie
Richard Rothstein	Yankee Controller Service



April 6, 2005
 USAF Primary Standards
 Laboratory
 Heath, Ohio
 Charles E. Mays
 Southern Ohio/Kentucky Section
 Coordinator

The spring meeting of the Southern Ohio/Kentucky Section 1132 of NCSLI was held on April 6, 2005, in the conference center at the Central Ohio Aerospace & Technology Center co-located with the USAF Primary Standards Laboratory in Heath, OH. The meeting was attended by 58 participants representing 19 companies.

Following a scrumptious continental breakfast provided by Bionetics, Charlie Mays welcomed everyone and introduced Ben Fullen, Bionetics Corporation, Air Force Primary Standards Laboratory Program Manager, our meeting host.

After opening comments by Mr. Fullen, Charlie made the following introductions: **Roxanne Robinson**, NCSLI, V.P. Industrial Programs, and V.P. of the American Association for Laboratory

Accreditation (A2LA). Roxanne began her first of three presentations of the day by providing highlights from the board of directors meeting.

Dr. Jaeger, Jaeger Enterprises, put in a plug for the tutorials that will be presented at the annual NCSLI Workshop and Symposium in Washington DC, USA on August 7-11, 2005. Klaus commented that the tutorial sessions have been very popular with the workshop & symposium attendees.

Paul Sauerland, Director of Sales and Marketing, Andeen-Hagerling, discussed the "*Applications of Ultra-Precision Capacitance Measurements*." During the Measurement Science Conference (MSC), I was able to talk Paul into providing our section the same presentation he had just delivered during an MSC session. The advancements in capacitance measurement and stability have been significant. Paul noted the following:

- Trends and new requirements for capacitance measurements
- Instrumentation for capacitance measurements
- Difficulties in making precise capacitance measurements
- What makes capacitance a good sensor technology?
- Monitoring small, fast changes in capacitance
- Application examples

Roxanne Robinson, V.P., A2LA discussed "*The Amendments to ISO/IEC 17025*." This presentation reviewed the changes in the new ISO 17025 (2005) that must be implemented by accredited laboratories by January 1, 2007.

After opening with a short history of ISO/IEC 17025, Roxanne emphasized ISO/IEC 17025 was a significant marketing advantage to the labs, especially in meeting the requirements of their uninformed clients who do not understand the difference between laboratory accreditation and ISO 9000 registration, and/or the suitability of ISO/IEC 17025 to the testing and calibration community. However, ISO 9001/9002 was dramatically revised in 2000, resulting in a process-oriented standard called ISO 9000 (2000) or "9K2K." ISO/IEC insisted that 17025 (1999) be revised quickly to "agree" with 9K2K so that there would be only one standard for quality systems and the laboratories could continue to claim compliance with 9K2K. However the laboratories had not had time to completely adjust to 17025 (1999) and were opposed to any significant revisions.

At that time, the same working group (WG) that wrote 17025, returned to the table to revise it in early 2001, at the behest of ISO/IEC. Considerable discussion ensued to decide how dramatically the standard should be revised:

- Part 4 verbatim to 9K2K
- Simply refer to 9K2K in lieu of Part 4
- Part 5 would not have to be touched
- Don't make any changes (if the WG didn't, ISO/IEC would)

After 2.5 years of work, in July 2003, the Draft Amendment (DAM) came out as a minimal alignment to 9K2K. The best the WG could do was reach consensus. ISO/IEC supported the result. With ISO/IEC support the draft was fast-tracked through the approval process

- Voted as a DIS (draft) standard
- Negatives were received, and so it was balloted again as an Final

Draft Standard (FDIS)

- It was approved and is expected to be published by June 2005
- It will not be considered an amendment; it will be a "new" 17025 with a 2005 date

ISO/IEC 17025 (2005) changes are fairly extensive, copies of the pending changes will be emailed to you, if requested. Send request to: <charlie.mays@afmetcal.af.mil>

Roxanne Robinson, V.P., A2LA discussed "Calibration Providers and Laboratories - Let's Talk!" Roxanne closed out her day with discussions on communication issues and general good laboratory practices to ensure that the calibration provider can give good service and the customer gets the calibration certificate they need to meet traceability and/or accreditation requirements. This presentation invoked many questions and a good deal of audience participation.

Steve Griffin, Eastern Regional Sales Manager, Fluke Electronics Corp., discussed Guardbanding or Automatic Guardbanding. Steve walked us through the decision process on Guardbanding. He addressed why consideration should be given to guardbanding and stepped us through the whole process. He ended with a question-and-answer period.

- Life in the cal lab
- Reality 1.01
- Guardbanding
- Reasons for Guardbanding
- ISO STD 17025
- Guardbanding Strategies
- Automation of Guardbanding
- Examples

Steve's presentation was clear, concise and to the point.

Again, if anyone would like a copy of the guardbanding briefing, please drop me an email at <charlie.mays@afmetcal.af.mil>

Prior to adjourning, Charlie requested the group suggest possible subjects for future meetings. Names were drawn for door prizes, provided by NCSLI, Bionetics, and E=MC3 Solutions. The meeting was closed with thanks to those attending and a call for a host organization for the next meeting in the fall. Attendees were enthusiastic and look forward to future meetings.

Editor's Note: Charlie mentioned to me that this meeting was his last for NCSLI with this simple lookback. Charlie, it is metrology personnel like you that make this great organization great. We all wish you the best in your retirement.

"During my tenure at the Air Force Precision Standards Lab, I became involved with NCSLI when an old friend, Alex Heyward retired, and I found an NCSLI Section Coordinator folder on my desk. With the help of Jeff Gust, we began rejuvenating the Southern Ohio and Kentucky Section of NCSLI. It was a lot of work, but fun.

I have met so many great people who have made the section coordinator job much easier, especially those of you experts and regular metrology managers, who have volunteered to speak at our meetings. Looking back over the years, we staged our largest meeting, with the assistance of Colonel Larry Yates, AFMETCAL Commander and his staff; for two days with over 150 attendees and

speakers from each of our DOD branches and NIST.

I will retire (for real) immediately following the NCSLI Workshop & Symposium in Washington DC. It has been fun, and as I said I've had the opportunity to work with so many talented people & friends who have been able to keep me looking good and out of trouble. I have seen many improvements within the Metrology community since I was a young airman at K.I. Sawyer AFB, Michigan in the mid sixties. Just think, 40 years in Metrology, it seems like yesterday.

We used the Weston 61 in the meter section, the Rotek 150 was our AC Voltage Standard (you could not place anything on top of it because it would overheat and burn-up), a Fluke 803 Differential Voltmeter, an HP410B AC Voltmeter, an X-13 Klystron in the microwave section, a Lavoie 800 to pick-up WWV as our frequency standard with an accuracy of 1×10^{-7} , and an HP 623 counter. I thought I had died and gone to heaven when we received a water cooling set-up for the X-13, because the frequency stability was so much better (HA). I never will forget the Frieden mechanical calculator, so much noise.

Who would have thought then, we would be where we are today; when we were introduced to a new component called the transistor during one of my early classes in PMEL School. Through the years, when a unit with tubes came into the lab, the younger techs would call me in to explain how they worked. Now maybe I'll have time to put my sailboat in the water. It's been in a friend's barn since I bought it two years ago. Again, cheers, it's been fun and I would do it all over again.

Sincerely,

Charlie Mays, aka, The Big Chicken



Roxanne Robinson from A2LA gave three presentations this day, including a long complex one on the recent trials and tribulations of ISO/IEC 17025. Charlie offers to email you the (2005) changes at his email address above.



We're going to miss Charlie's ability to draw large crowds of metrologists to Central Ohio.

Reports from the Regions

Attendees:

Carl, Atkinson	Schober Calibration Service, Inc
Doug, Baker	AFMETCAL Det1 /ML
Lloyd, Baker	Dynamic Technology
Mike, Cadenhead	Bionetics
Alice, Chaffin	Battelle Memorial Institute
Alan, Clune	AFMETCAL Det 1/ML
Stan, Coleman	AFMETCAL Det 1/ML
Bill, Conrad	Bionetics
Lee, Crader	Accu-Check Instrument Service, Inc
Jim, Daum	Bionetics
William, Davenport	TRC Inc.
Brett, Degler	AFMETCAL Det 1/ML
Matthew, Denslow	AFMETCAL Det 1/ML
Donald, Erden	AFMETCAL Det 1/ML
Walter, Firth	MIE - WKM
Kathy, Frank	Avon Automotive
Ben, Fullen	Bionetics
Jack, Gard	Bionetics
Bill, Gebel	Bionetics
Debbie, Gilkerson	Schober Calibration Service, Inc
Steve, Griffin	Fluke Corporation
Dan, Gumbish	AFMETCAL Det 1/ML
Jeff, Hetrick	Bionetics
Klaus, Jaeger	Bionetics
Ed, Justus	AFMETCAL Det 1/ML
Kevin, Kaufman	TEGAM, Inc.
Scott, Knight	Bionetics
Keith, Kruse	KECO Industries, Inc.
Phyllis, Levy	Bionetics
Greg, Levy	Bionetics
Andrew, Loe	Battelle Memorial Institute
George, Long	Bionetics
Dick, Magalski	Bionetics
Charlie, Mays	Bionetics
Bill, McAlpine	AFMETCAL Det 1/ML
Bill, McCarver	Battelle Memorial Institute
Mike, McDonough	Thermo Electron
James, Meyer	Battelle Memorial Institute
Jon, Morrison	AFMETCAL Det 1/ML
Robert, Nappier	AFMETCAL Det 1/ML
Charles, Nichols	AFMETCAL Det 1/ML
Craig, Niemann	AFMETCAL Det 1/ML
Earl, Paazig	AFMETCAL Det 1/ML
Chris, Pero	Bionetics
Kevin, Pfeiffer	Great Lakes Scales
George, Rine	Bionetics
Roxanne, Robinson	A2LA
Doug, Sauer	EQS Systems
Paul, Sauerland	Andeen-Hagerling
Dave, Schick	AFMETCAL Det 1/ML
Dilip, Shah	E=MC3 Solutions
Kevin, Smith	Bionetics
Mona, Smith	Bionetics
Carl, Snyder	Battelle Memorial Institute
Kenneth, Stall	GE Industrial Systems
Michael, Sumich	AFMETCAL Det 1/ML
Mike, Trombley	Detroit Testing Laboratory, Inc
Dave, Wingrove	AFMETCAL Det 1/ML



April 22, 2005
 Robert Bosch Corporation
 Farmington Hills, MI
 Pat Butler
 Michigan Section Coordinator

The Michigan Section Spring meeting was hosted by Patrick Butler of the Robert Bosch Corporation. Patrick opened the meeting with a brief introduction and a description of Bosch and its calibration lab. Lonnie Spires, our regional V.P., of Dynamic Technology provided an update from the Board of Director's meeting. He also discussed the importance of membership and encouraged attendance to the NCSLI conference.

Steve Griffin from Fluke Corporation provided a presentation on Guardbanding which really seemed to open a lot of peoples eyes. A lot of people will now think twice before calling something in or out of tolerance.

Matt McLaughlin from Cal-Corr discussed flow calibration. His discussion included how it is done, some of the types of errors and problems and the different types of methods. The topic generated a lot of interaction among the attendees. Proficiency testing was cited as an issue in the world of flow calibration. Matt and Greg Minard of General Motors discussed the possibility of creating a round robin for flow.

Joe Chou of Bruel & Kjaer gave our next presentation on accelerometer calibration. He explained the different types of accelerometers as well as the different methods for calibrating them.

Lunch was served! We would like to thank Steve White of Bosch for providing lunch. Steve is the manager of the Engineering Test and Development department. Bosch's calibration lab is part of his department.

Bob Levine of LAB gave us some insight into ISO 17025 and accreditation. He particularly discussed how the accreditors are accredited and explained the mutual recognition agreements. Bob had to get home to celebrate his wife's birthday. He brought with him birthday wishes from each of the attendees.

Patrick Butler hosted an open forum with discussion centered on how to survive cost-cutting actions, especially in the automotive market. Automating was the key to doing more with less. Discussions of Fluke's Met/Cal and On Time Support's Barcode Magician were highlighted as good examples of improving efficiency and throughput.



A goodly attendance at the Michigan meeting. Congratulations to our new Section Coordinator Pat Butler.

Attendees:

Phil DeBerry	Anger Associates
Patrick Butler	Bosch
Ryan Davanzo	Bosch
Sam Davis	Bosch
Jack Halliwell	Bruel & Kjaer
Joe Chou	Bruel & Kjaer
Matt McLaughlin	Cal-Corr
Nick Serafin	Consumers Energy
Robert Sawyer	Consumers Energy
Bob Andersen	Continental Teves
Mack Tadros	Continental Teves
Michael Trombley	Detroit Testing Laboratory
John Hepler	DTE Energy
Kofi A Antwih	DTE Energy
Andrew Bush	Dynamic Technology
Carl Dossa	Dynamic Technology
Lonnie Spires	Dynamic Technology
Steve Griffin	Fluke Electronics
Greg Minard	GM Powertrain
Chuck Pitzen	Honeywell Sensotec

Bob Levine	LAB
Chris Church	Measurement Instruments
David VanKainen	Measurement Instruments
Scott Stewart	Measurement Instruments
Dan Hermann	On Time Support
Scott Burek	Sypris Test & Measurement
Maria Stoletova	Wayne State University



May 12, 2005
 Historical Electronics Museum
 Linthicum, Maryland
 Rudy Stim
 Maryland Section Coordinator

The Spring 2005 NCSLI Region 1210 Maryland Section meeting was held at the Historical Electronics Museum in Linthicum, Maryland. Exhibits include radar, radio, and other electronics systems, such as the camera system used by Apollo 11 astronauts on their moon-walk. The museum covers 22,000 square feet and contains a large maze-like exhibit area, conference hall, offices, research library and storage.

Speaker: Georgia Harris, NCSLI VP Education & Training, explained the need to provide for greater education and awareness for metrologists. The need for new metrologists will exceed the supply as older workers retire.

Speaker: Jeff Gust, NCSLI Executive VP, updated the group on recent Board of Directors meeting topics.

Speaker: Dilip Shah, ASQ, Measurement Quality Division, Chairman, spoke on the Metrology Certification and Testing program. He also introduced The Metrology Handbook, a new ASQ-MQD publication and explained its value to our professional community.

Speaker: Jeff Gust, Quametec, Director of Proficiency Testing Services, spoke about proficiency testing. In his example of a temperature probe calibration, he explained some of the processes labs go through to demonstrate measurement proficiency. Several of our listeners found this an interesting process.

Speaker: Lloyd Snyder, Northrop Grumman Metrology Engineering, discussed his efforts in coordinating a Measurement Comparison Program (MCP) on an accelerometer. He generally summarized lessons learned while improving our understanding of the sources of accelerometer measurement error.

Speaker: Bernie McDermott, Northrop Grumman Metrology Engineering, discussed his involvement with an ARFTAG measurement comparison program investigating three different "cal kit" set up methods for a scalar network analyzer.

In general attendees found the material interesting and thought provoking. Thanks to all that helped to make this an interesting program.



We asked the group to gather for a photo before allowing them to enjoy a great lunch in Pioneer Hall of the Historical Electronics Museum.

Attendees:

Rich Appel	NGC
Dana Leaman	A2LA
Phil Graham	NGC
Phil Smith	A2LA
Tom Hettenhouser	TH Metrology
Dilip Shah	E=MC3 Solutions
Phil Bramucci	NGC
Georgia Harris	NIST
Rudy Stim	NGC
Mel Foremny	NGC
Michael Chase	NGC
Jeff Gust	Quametec
Darren Reynolds	NGC
Will Guthrie	NIST
Susan Dass	ARA
Vernon Alt	NGC
Lloyd Snyder	NGC
Bernie McDermott	NGC
Thomas Weidmyer	FCC
Robert Schmidt	NGC
Paul Keimig	NGC
Gilbert Tyler	NGC
Gary Jennings	NGC



May 3, 2005
 Center for Innovative Technology
 Danville, VA
 Tom Hettenhouser
 VA/NC Section Coordinator

The Virginia and North Carolina sections held a joint meeting on May 3 at the Center for Innovative Technology in Danville, VA. Having the meeting there was an excellent prelude to our national conference theme of advances in science and technology. The facility and service was excellent. The meeting was co-hosted by EDL and SIMCO Electronics. ACR Environmental Services, The Center for Innovative Technology, Pittsylvania County Economic Development, and the Southern Piedmont Technology Council provided sponsorship as well. Tom Hettenhouser, Virginia Section Coordinator, conducted the meeting.

The meeting opened after a continental breakfast and exhibit review. Tom welcomed all the attendees and discussed the importance of membership and involvement in NCSLI.

Our speakers for the day were Randy Fowler of Fluke, Tom Hettenhouser of TH Metrology, and Kenneth Sloneker of EDL. Randy's presentation was a very thorough discussion of uncertainty,

Reports from the Regions

how it is estimated, and reported. Tom spoke of the use of uncertainty information in a discussion of risk analysis and guardbanding.

The afternoon presentation by Ken discussed his research into inhomogeneity in thermocouples that detailed how the emf produced was affected by this factor. All presentations were well received and appreciated by the attendees.

Door prizes were drawn for at the end of the day. Donations were a Fluke 65 IR Thermometer by TH Metrology, two Calibration Philosophy & Practice books and two volt alerts by Fluke, a handheld electronic pyrometer and probe from EDL, and two notebooks from A2LA. A2LA also provided pens for all the attendees.

Very special thanks to Vadim Ostrovsky of EDL who put much effort into planning and organizing this meeting. I would also like to thank Sara Spissu, an EDL intern, for her great effort in contacting attendees for this meeting. The vendors who supported with exhibits contributed much to the success of this meeting.

Attendees:	
Todd McCulloch	PCI
Rodney Perkins	PCI
Keith Kensley	PCI
James Parker	PCI
Carol Motley	Economic Development Council
David Burtis	CIT
David Burtis	Technology Council
Elise Fitzmaurice	Simco Electronics
Mark R. Fowler	Fluke Corporation
Manfred Strauss	Fluke Corporation
Tony Pavell	Cardinal Health
Chris Dickson	Cardinal Health
Thomas Hettenhouser	TH Metrology
Michael Kramer	VA DOA and Consumer Services
David Edwards	Wyle Laboratories
Charles Martak	ACR Environmental Services
Bob Rowe	CR Environmental Services
Chris Moore	Master Gage and Tool
Charles Davidson	Corning Inc
David Decker	Corning Inc
John Heinrich	DCC
Tina Harville	Luna Technologies
John Roberts	EDL
Angela Piper	EDL
Steve Winnes	EDL
Kenneth Sloneker	EDL
Donald Polsky	EDL
Vadim Ostrovsky	EDL
Lou Ruggeri	Standard Calibration
Eddie Woolwine	ATK Metrology Lab
Van Hyder	NC Standards Lab



April 21, 2005
 Central Georgia Technical College
 Macon, GA
 Jay Romanek
 Atlanta Section Coordinator

NCSLI Atlanta Section recently held its Spring meeting hosted by Central Georgia Technical College in Macon, Georgia on April 21, 2005. The theme was "Education and Training-Facing a Shortage of Qualified Metrology Personnel". After registering for the meeting, a wonderful breakfast was enjoyed by all attendees in the new College Centre at CGTC.

Jay Romanek, NCSLI Atlanta Section Coordinator, welcomed all attendees, and thanked them for taking time out of their busy sched-

ules to take part in the discussions about the shortage of qualified Metrology personnel. Jay introduced Tony Abel, the Program Chair for the Metrology Program at CGTC. Tony also welcomed the attendees to Macon and Central Georgia Technical College.

Tony then introduced Randall Francis, the Metrology instructor and the architect of Central Georgia Technical College's online Metrology program. Randall briefed the attendees on the CGTC Metrology program. He provided the group with a detailed overview of the curriculum in the Metrology program.

See page 20 for a complete overview of the CGTC Programs.

Randy Fowler, Regional Sales Manager; Fluke Corporation, gave an outstanding talk on vendor-supplied training. He touched on the on site and the Web-based training offered by Fluke. All agreed that vendor-supplied training filled a niche in the shortage of Metrology training. The group adjourned to the CGTC Food Court for lunch.

Richard Lewis, the State Metrologist for Georgia, gave a very informative talk on the duties of the Office of Weights and Measures. He spoke on the most visible of his office's duties, the calibration of the gasoline pumps across the state. He also spoke about the office's scale division. The state provides certification for six levels of scale mechanics and installers. Other duties of the state Metrology office are to calibrate and certify dairy farm milk tanks, calibrate propane gas flow meters, as well as to calibrate and certify the weight sets used by scale companies and the balls used in the Georgia state lottery. Mr. Lewis then entertained questions from the group

Jay then introduced Ms. Georgia Harris of the Weights and Measures Division of NIST, who is also the Vice President for Education and Training of NCSLI. She provided an overview of the Metrology training seminars offered by NCSLI. Ms. Harris also spoke of the commitment of Mr. Harry Moody, President of NCSLI who has set education and training of qualified Metrology personnel as a top priority on his agenda for the upcoming year.

Ms. Harris spoke of the lack of standardized job descriptions in the Metrology industry. She also mentioned the Certified Calibration Technician (CCT) certification exam administered by The American Society for Quality (ASQ). Ms. Harris shared the NCSLI Board of Director's January meeting minutes with the group. Ms. Harris then opened the floor for questions.

Jay Romanek thanked all in attendance for their support of Metrology education and training. He also thanked Jack Laster and Tony Abel of Central Georgia Technical College for their support and for hosting the Atlanta Section meeting.



Don't these people look like they are filled to the brim with knowledge about Education and Training?



Feb. 17, 2005
 Dytec Instruments
 St. Paul, MN
 Shawn Mason
 Twin Cities Section Coordinator

The February 17, 2005 meeting of the Twin Cities Section of NCSLI was hosted by Dytec Instruments which was held at the Eagan Community Center and was attended by 72 participants and 32 companies. We thank Roger Zematis from Dytec Instruments and the Eagan Community Center for providing an excellent meeting room along with coffee, soda and pastries.

Speaker: Casey Hodges - Colorado Engineering Experiment Station Inc. (CEESI)

Topic: Flow Measurement and Calibration

The following topics were covered in this presentation: Flow Concepts, Mass Flow vs. Volume Flow, Calibration and Installation Effects. Casey started out by talking about Density, Specific Gravity, and Viscosity. He explained the difference between Mass Flow Rate, which is mass per unit time and is independent of density and Volume Flow Rate, which is volume per unit time and is dependent on density. Next he talked about Standard Volume at the most common standard conditions of 14.7 psia and 20°C. He also gave examples of actual vs. Standard Volume and Mass vs. Volume Flow Rate. Casey spoke about Primary and Secondary Flow Systems. Primary Systems are traceable through Mass, Length, and Time.

The following are examples of a Primary Flow System:

Gravimetric - direct mass measurement (weighed before and after)

Volumetric - mass determined from length (volume), and density. Example of a Volumetric Liquid System is a Ball Prover. Other Primary Systems are Bell Prover (Gas), Piston Prover (Liquid and Gas). Secondary System is a Critical Flow Venturi that is in line with the customers unit and has a .5% uncertainty, while the Primary Systems have a .10% to .25% uncertainty.

Finally, he talked about Installation Effects. Flow distortions are caused by the following: Elbows in/out of plane, spiral welded pipe, expanders, reducers and especially valves when they are partially open. In order to reduce installation effects you have to make sure you have the correct meter, sufficient amount of pipe, simulation during calibration, and finally using flow conditioners which are Tube Bundles, Etoile, Perforated Plate or a Zanker.

Speaker: Tom Tremmel/Keith Summers - Productivity Quality (PQI)

Topic: Machine Tool Calibration

Tom first started out by talking about why do we measure machine performance and the reasons are: minimize scrap, downtime, comply with ISO 9000, grade the performance of your machine tools, extend the life of your machine, and validate the quality of a new machine upon delivery. He then talked about two ways on how to measure the performance of your machine, which are Laser calibration and error compensation every 12 months and Ballbar testing every 6 months to be used as an interim test. Keith Summers talked

about the seven tests that the Laser measures. They are Linear, Angular, Straightness, Flatness, Rotary, Dynamic, and Diagonal tests.

He then explained the set up for each. The Linear test uses a stationary reflector and beam splitter and a moving reflector. The Angular test uses a stationary interferometer and a moving reflector. The Straightness test uses a moving wollaston prism and a stationary straightness reflector. Finally the Diagonal test uses an interferometer that measures the linear positioning accuracy of the machine as it moves along each of its four body diagonals in turn. Next, Tom talked about the benefits of using a Ballbar as an interim test to check the performance between calibrations. The Ballbar test is used to diagnose all common machine errors, advises on possible causes and remedies, and can be used as part of a planned maintenance program. It can also be used as an early warning of potential problems and can reduce machine downtime.

Speaker: Walter Nowocin - Medtronic

Topic: Featured Lab

Speaker: Kevin Bull - Veriteq Instruments Inc.

Topic: Humidity

The following topics were covered in this presentation: Common Types of RH Measuring Devices, Calibration Methods, Importance of RH and Temperature in the Cal Lab, Measuring RH and Temperature in the Cal Lab. Kevin first started out by talking about types of RH devices, which consisted of mechanical, psychrometer, and the chilled mirror. A mechanical sensor that uses a Fiber (Hair), that is based on length changes with humidity, has low accuracy and poor stability. The resistive sensor, difficult to use below 20% RH, also has saturation and contamination problems which contribute to its poor accuracy. The capacitive sensor utilizes the dielectric of a capacitor to change with RH; this sensor has good stability and linearity.

Next, the psychrometer uses a dry and wet bulb, which has accuracy and consistency problems. The chilled mirror is the most accurate way to measure RH because it measures the dew point/frost point. Kevin then talked about the four methods of calibrating RH. The first method is comparison, one instrument is placed next to another, the standard should be more accurate than the device being calibrated, and the method has temperature gradient problems. The second method is divided flow, which uses saturated air and dry air that is mixed to create the desired RH.

The third method is using saturated salt solutions, which is the physical properties of salt in a saturated water solution. This method is difficult to maintain consistent RH levels, degrades over time, and can cause corrosion and contamination of the instruments. The fourth method uses a two-pressure system. The two-pressure system is commonly used as a primary standard because of its high accuracy. The two-pressure system measures the ratio of pressures: $RH = P_c/P_s$.

Speaker: Dilip Shah - E = mc³ Solutions

Topic: Proficiency Testing

Dilip began by asking the question, "What is proficiency testing?" From ISO Guide 2 it is "determination of laboratory testing performance by means of Interlaboratory comparisons". He also listed the flowing standards that are related to proficiency testing. They

Reports from the Regions

are as follows: ISO Guide 43 parts 1 and 2, ASTM E1301, ASTM E691, NCSLI RP-15, and ISO 5725 parts 1-4.

Next he talked about why should laboratories participate; following are the reasons: Establish confidence and be a demonstration of accreditation; help the customer decide if the laboratory meets its measurement, calibration and testing requirements; and serve as a measure to ensure that the laboratory continually meets its quality requirements. Another reason to participate if you are trying to obtain ISO 17025 accreditation states "The laboratory shall have quality control procedures for monitoring the validity of tests and calibrations undertaken". 5.9b states "participate in interlaboratory comparison or proficiency-testing programmes". He described three proficiency testing schemes, which are the following:

Measurement Comparison Scheme:

Interlaboratory Testing Scheme:

Split-Sample Testing Scheme:

The final and most important step is data analysis. It is important that the Proficiency Testing coordinator has a good statistical support base to ensure that the correct, unbiased assumption about data is made and reported. The following is an example of type of data analysis:

- Mean
- Standard Deviation
- Range (range can be a good estimator of variability)
- Statistical significance using z, t or F tests
- Analysis of Variance (ANOVA)
- Gage Repeatability & Reproducibility

Attendees:

Ek, Jim	3M Center Calibration Lab
McDonald, Mike	3M Center Calibration Lab
Paulson, Dennis	3M Center Calibration Lab
Conder, Terry	3M Corporate Metrology Lab
Lamin, Sema	3M Corporate Metrology Lab
Otto, Jeff	3M Corporate Metrology Lab
Meza, Silverio	Alliant Techsystems
Killian, Jay	Andersen Corp
Spinks, Harry	Boston Scientific
Kruta, Kevin	Calmetrics
Kegel, Tom	Ceesi
Urban, Greg	Computype
Fleischer, Mike	Donaldson Company
Johnson, Mitch	Donaldson Company
Zemaitis, Roger	Dytec Instruments
Shaw, Dilip	E=MC3
Megilllis, Pat	Fastenal Co Lab
Cummings, Wayne	Fluke Corporation
Erickson, Doug	General Dynamics
Howard, Don	Goodrich Corp - Sensor Sys Div
Laust, Daniel	Goodrich Corp - Sensor Sys Div
Roden, Larry	Guidant
Franzwa, Stacy	Hutchinson Technology
Martell, Scott	Hutchinson Technology
Snitker, Craig	Hutchinson Technology
Meyer, Gary C.	J&G Technology
Herdine, Scott	Lockheed Martin
Brion, Rick	Martin Calibration
Bohrer, Robert	Medtronic
Burch, Doug	Medtronic
Carpentuer, Ruel	Medtronic
Clark, Thomas	Medtronic
Hebrink, Chris	Medtronic
Hentz, Derrick	Medtronic
Ludwig, Dave	Medtronic
Mjoen, Gregory	Medtronic
Nowocin, Walter	Medtronic
Scheible, Curtis	Medtronic
Grangroth, Julie	MTS
Johnson, Keven	MTS
Kreitlow, Dave	MTS
Moser, Bill	MTS

Oneil, Tia	MTS
Remer, Bob	MTS
Rust, Kevin	MTS
Gruetzman, Jim	Mueller Sales
Barta, Jason	NMCCO
Closmore, Carl	Northwest Airlines
Scarpari, Paul	Northwest Airlines
Vanderveen, Dan	Northwest Airlines
McDougall, Jane	Precision Repair & Calibration
Anderson, Greg	Productivity Quality
Binning, Doug	Productivity Quality
Summers, Keith	Productivity Quality
Tremmel, Tom	Productivity Quality
Earl, Jon	Protien Design Labs
Ward, Randy	Simco
Mason, Shawn	St Jude Medical
Czech, Mike	St. Jude Medical
Marcotte, Sue	St. Jude Medical
Martz, Gary	St. Jude Medical
Adams, Bruce	State Of MN - Wts & Meas
Hockert, Carol	State Of MN - Wts & Meas
Kendall, Walt	Trane Co
Shepard, Ivan	Trane Co
Stremcha, Terry	Trane Co
Jensen, Cindy	Truth Hardware
Newman, Leroy	Truth Hardware
Dolezal, Jim	United Standards
Bull, Kevin	Veriteq
Hanssen, Paul	Workplace Training
Degroot, Gaylord	
Roden, Adam	



May 11th, 2005
 Promega Corporation
 Madison, WI
 Jay Bucher
 Madison Section Coordinator

Twenty five people were in attendance at the May 11th, 2005, Madison Section meeting held at Promega Corporation in Madison, Wisconsin. The good folks from Promega furnished excellent facilities and Bucherview Metrology Service provided the fresh Krispy Kreme doughnuts, while lunch was "pay as you go" for this meeting.

Presentations in the morning were given by Reinhard Schwind from Sartorius, whose topic was entitled: Balances and Scales in an Analytical Environment. From the start, it was easy to see that Reinhard was passionate about his topic. Many went away from his presentation with additional ammunition to fight the constant battle of users moving their balances and getting them checked or recalibrated.

The second speaker was Roger Muse and Dr. Bill Hirt from ACLASS. They updated the attendees on the upcoming changes to ISO 17025 with their presentation entitled: Accreditation. Good information for those already certified to this standard, and for those heading in that direction.

Our third speaker was Jack Somppi from Fluke Corporation. Jack gave his presentation on Monitoring the Performance of Laboratory Standards. The presentation gave many view points on monitoring from different perspectives, both inside and outside of a company, and their effects on both set of customers and the calibration function itself.

After everyone got their lunches, door prizes were handed out, with all attendees receiving something from Bucherview Metrology Services, Fluke Corporation, NCSL International, or 3M (two books were awarded): The Metrology Handbook and Fluke's Calibration: Philosophy in Practice.

A group photo was taken in the Atrium of Promega, with the best looking up front to get the most benefit of a photogenic moment (a little humour from the author).

We would like to express our gratitude to Terry Conder, our Central Division V.P. for his attendance and participation, along with the great door prizes he furnished on behalf of 3M.

After lunch, our next speaker was Karl Kurtz from DH Instruments. Karl talked about Very Low Pressure. His demonstration of measuring how tall an object was (himself) using a manometer was both instructive and entertaining. It easily brought home the various elements of his presentation with an easy-to-understand display of how sensitive his topic really is.

Terry Conder next gave an update on the most recent board of directors meeting, and the changes to various positions within NCSLI. Terry informed everyone on the deadlines for early-bird specials and final deadlines for registering for this year's NCSLI Workshop & Symposium. Terry also donated some 3M gift packs that have become a much sought-after item at our section meetings.

Our final speaker was Karl Wigdal from Promega Corporation. He gave a brief overview of Promega's Metrology Department, followed by a tour of Promega's facilities.

I would like to thank all of the attendees for their participation and interest in the topics presented. We had a varied group of people, and it is hoped that future meetings can be attended with the same vigor and enthusiasm.



Jay reported that the more photogenic attendees were asked to pose up front. Don't you have to wonder how they made the selection?

- Attendees:**
- | | |
|---------------|-------------------------|
| Terry Conder | 3M |
| Dr. Bill Hirt | ACLASS |
| Roger Muse | ACLASS |
| Erin Mundt | Bone Care International |
| Don Navis | Covance |
| Kurt Waldmer | Covance |
| Matt Pinney | Covance |

- | | |
|------------------|----------------------------|
| Karl Kurtz | DH Instruments |
| Bill Okon | Dytec/Midwest, Inc. |
| Walter Cummings | Fluke Corp. |
| Jack Somppi | Fluke Corp. |
| John Vesely | Hamilton Sundstrand |
| Tim Siter | Hamilton Sundstrand |
| Gary Meddock | Harlan Sprague Dawley |
| Jason Eyler | Harlan Sprague Dawley |
| John Roethke | PharmTech Support Services |
| Chuck Dantuma | Precision Metrology |
| Cori Pinchard | Promega Corporation |
| Jay Bucher | Promega Corporation |
| Karl Wigdal | Promega Corporation |
| Keela Sniadach | Promega Corporation |
| Bob Golder | Sartorius Corp. |
| Reinhard Schwind | Sartorius Corp. |
| Mike Wilson | SPL |
| Doug Johnston | United Scale |



April 26, 2005
 Agilent Technologies, Inc.
 Santa Rosa, CA
 Guy Fleming
 Central California/Nevada Region
 Coordinator

In the early morning of April 26, 2005, I found myself and Dennis Sanchez heading up to Santa Rosa to attend and chair the Spring NCSLI region 1410 meeting. This meeting was the first to be held outside our normal area of attendees and I wasn't too sure how many would attend. Although the Agilent facility has always given us excellent attendance before, I was still a little unsure how many we would have. It turned out that 26 folks made the meeting, which was quite gratifying to say the least.

As Dennis and I headed North on our 2-hour trip, it gave me an opportunity to go over the plans for the day. It was still dark when we left, but by the time we neared San Francisco, the sun was just breaking the morning darkness. As we crossed the Golden Gate bridge the sun was rising and casting a beautiful light across the bay as well as the city of San Francisco and Alcatraz island. It was clear with not a sign of fog. It is times like this that make me thankful that I live in this great country.

As we continued across the bridge, Dennis, who was raised in this area, pointed out some of the local sites and where some of the Dirty Harry movies were made, as well as, one of my favorites, American Graffiti. As we continued on, I looked at the agenda and knew that the meeting would go well as my "three amigos," who are always willing to give presentations, were last on the schedule. Richard Fertell, Dr. Brian Lee and Dr. Dennis DuBro have always been outstanding and their love for their work always comes across. Their natural ability to communicate to their audience keeps us motivated to listen on. We were also fortunate to have Peter Dack from Fluke and Barry Worthington from the State of California who enlightened us on how to get added money from the State which is always a plus for many with limited overhead funds.

Once we arrived at Agilent, our host, Dave Funston, greeted us and showed us to our meeting room. Everything was set up and ready to go. Special thanks to Dave and the Agilent facility for providing us a great location as well as the morning coffee and yummys.

The meeting went well and all within the set timeframe. As many came from distant locations I wanted to make sure we were all on the road by 3-3:30. Around 3 that afternoon we handed out our door prizes and packed up with great information learned from the day. I

Reports from the Regions

must say all went well with special thanks to Jim Wookey and the Fluke corporation for always being available to support, as well as the generous added offerings of door prizes.

As Denny and I headed out, I thought back on what Brian had taught us about RF connectors; Dennis and his anti-correlation theories; Richard and his triple point creations; especially knowing he did his first realization at his home which added to our understanding that he loves his work. Barry's great help and knowledge that many of us had not known in acquiring funding from the State; and of course Peter's astuteness in using their reference meter for doing ratios and the alike.

A great Day! And to think I get to see the Golden Gate bridge once more; now in the early evening sunset. It doesn't get much better than that.

Oh, I almost forgot, it does! As when I arrived home, my wife was waiting with a gourmet meal, a kiss and a scotch on the side.

Editor's Note: I love serendipity. This was the issue when my editorial talked about the personality of NCSLI, page 2. And along comes Guy with his "trip report" to his regional meeting and this unusual report. I, too, used to commute up to Agilent, Santa Rosa, for a time, and the trip through San Francisco and across the Golden Gate was a real plus.



For the first time in a long while, Guy scheduled a meeting on the very north fringe of the Bay Area, at the Agilent facility in Santa Rosa. He was pleased that his attendance was almost as good as when held at his Lockheed location.

Attendees:	
Beatty, Chuck	Agilent Technologies
Bessonon, David	Ward/Davis
Cleland, Victor	United Airlines
Dack, Peter	Fluke
Daniels, Tom	AMS
Downing, Brandon	MetricTest
Dubro, Dennis	PG&E
Fallen, Charles	SMUD
Fertell, Richard	Protesus Ind.
Finch, Tony	TRS/RenTelco
Fleming, Guy	Lockheed Martin
Funston, Dave	Agilent Technologies
Joos, Steve	Micro Precision Calibration
Lee, Brian	Anritsu Co.
Lundy, Neil	United Airlines
Nguyen, Tien	SMUD
Perez, Gilbert	Anritsu Co.
Pluchar, Michael	Ward/Davis
Robinson, Marc	SMUD
Sanchez, Dennis	Lockheed Martin
Schrijver, Bart	Agilent Technologies
Singh, Suren	Agilent Technologies
Vasquez, Rick	Dade Behring
Wofford, Tim	Elan BioPharm
Wookey, Jim	Fluke
Worthington, Barry	State of CA - ETP



May 12 & 13, 2005
 Idaho National Laboratory (INL)
 Idaho Falls, Idaho
 Keith Cable and Bernard Morris
 Section Coordinators
 Region 1430 & Section 1425
Joint Meeting
 Derek Porter

Jim Allred of the Idaho National Lab hosted our meeting. We used on-line registration to cover our hotel meeting room cost. Our host provided buses for the tour, a fifty-mile trip out to the desert site of INL. The speakers were excellent and touring the Health Sciences and Standards lab areas all made for another great NCSLI region meeting.

Agenda:

Thursday

- Derek Porter--NCSLI Board update
- Fran Williams--INL Information Presentation
- Randy Van Wie-"Tektronix Accreditation"
- Dave Woodward-Boeing "Metrology Education & Training"
- Ron Ainsworth, Hart Scientific "Temperature Uncertainty"
- INL tour (Jim Allred-host)
- No host dinner, Red Lion Westbank

Friday

- Harry Moody, President, NCSLI 2005
- Mike Stears, INL-"JJ Array Program"
- Brad Price, Pacific Edge Technology "Calibration Data Management Alternatives"
- Derek Porter-ANSI/NCSLI Z540 standards

Keith arranged for the speakers. Keith is passing the torch and Carolyn Johansen of JJ Calibration in Portland has offered to take over for region 1430. Carolyn, like Keith before her, has been a long time contributor to the success of the Northwest Region.

The meeting produced some lively discussions. Education and Training was presented by Dave Woodward of Boeing. Dave used subject matter introduced by Georgia Harris's work on building a roadmap for Education and Training and pushed it along the lines of metrology management concerns. The group's response emerged in the following areas:

- Industry funding was the first subject raised by the audience. Boeing was sharing the cost with the employee in the example given.
- ASQ and NCSLI might have conflicting agendas. The two organizations actually share many contributors, but do not share the same organizational structure.
- The shift from audit to accredit has confused the industry. This is not transparent. It places a new structure on Education and Training and makes certifying technicians seem almost required.
- More work should be done to recognize existing metrology training wherever it hides.
- Concern was expressed over training for parameters that often results in dismantling previous misdirection. This made the case for on-the-job training or training on-site. It was felt that the lack of recognized curriculum results in a lot of redirection and retraining of metrologists.
- Training for upper level industrial engineering metrologists is needed.

- Parent organizations seemingly place metrology anywhere; metrology training is obscured.

The vast NCSLI US Western Division presents some challenges for our coordinators. The willingness of the speakers to share their metrology and participate where we ask is quite remarkable. Thanks to all who joined us in Idaho Falls. The presentations are available at:

<http://www.geocities.com/derekporter/>



Everything is spaced out at long distances in the Northwest. This intrepid group traveled all the way to Idaho for their regional meeting, which included a 100-mile round trip just to get to the meeting site. Kudos to all.

Attendees:

Carolyn Johansen	JJ Calibration
Jan Johansen	JJ Calibration
Ronald Francom	ATK Thiokol
Rodney Moon	ATK Thiokol
Jim Allred	Battelle Energy Alliance
John Atkins	Energy Northwest
Derek Porter	Boeing
David Woodward	Boeing
Brad Price	Pacific Edge
Mike Stears	Battelle Energy Alliance
Mike Sato	Battelle Energy Alliance
Larry Demming	Battelle Energy Alliance
Scott Lish	Battelle Energy Alliance
Douglas Schwartzberger	Battelle Energy Alliance
Fran Williams	Battelle Energy Alliance
Bernard Morris	Hart Scientific
Ron Ainsworth	Hart Scientific
Del Knapp	Tektronix
Rany Van Wie	Tektronix
Harry Moody	Harry Moody Enterprises



NATIONAL LABORATORY ASSOCIATION, SOUTH AFRICA

Charles A. Motzko

The NLA is pleased to be able to keep you up-to-date with the Association's most recent activities as well as information pertinent to the laboratory world.

Training

Editor's Note: The training schedule arrived too late for the announcements of April/May classes. That is one of my problems with a quarterly newsletter; its lead time makes it more difficult.

Calibration Inter Laboratory Comparison

As previously reported, the NLA will shortly be kicking off a unique 'on-site' ILC. The format will be such that a number of items will be made available for calibrating at the NLA offices to simulate the 'on-site' process. Those participating can elect to do as much or as little as they want to. This will enable those labs who have 'on-site' scopes to participate, as well as those who want to consider expanding into this area. They will have the opportunity to gather and thereby provide sufficient data for SANAS to use when the accreditation assessment is conducted.

The target date for this to begin was April and the most likely items that were made available are as follows.

DMM, Frequency Counter, Scope, Megger, Balance, Oven (Temperature Mapping)

Those labs that wish to participate should contact the NLA Offices to ensure that they are placed on the list. If there are any other items that should be considered, please provide this information and we will do what we can have them provided. The organisers plan to have the results presented at the T&M Conference in September.

Proficiency Testing

As reported in our last newsletter, the NLA intends embarking on the provision of relevant PT Programs for the SA lab community.

As a result of the survey we conducted, the following would appear to be the areas of interest.

- 1) Environmental
- 2) Minerals
- 3) Chemicals
- 4) Electrical Testing
- 5) Food

To move this initiative forward it is proposed that we will select one or two areas and then advise everyone of the details, including materials/matrix, establishment of reference values, analysis, costs etc. Whilst a number of labs have shown interest, the NLA continues to seek participation and if there is anyone who would like to get involved, please contact us in that regard. Contact: Steve Sidney, <steves@nla.org.za>

Current Lab Info Update

- 1) International ILAC and the IEC have signed a MOU which in effect allows for the joint assessment of labs involved in Electrical Testing so that both IEC and ILAC ISO 17025 Accreditation can be achieved in a single assessment, thus reducing the amount of duplication both time and cost wise. If you need more details, please contact the NLA Office.

Reports from the Regions

- 2) The South African lab community is once again reminded that the NLA is an extremely important voice in the world of lab affairs both locally as well as internationally. Organisations are encouraged to become members in order to have the NLA truly represent local lab views. Here are some current examples of the achievements of the NLA in this regard:
- Helped to shape the alignment of ISO/IEC 17025 in terms of ISO9001:2000.
 - Was instrumental in the background work between ILAC and IEC (see above)
 - Is currently active in the debate surrounding Accreditation of PT and Reference Material suppliers.
 - Is playing an active role in the development of Educational Standards for Metrology/Calibration
 - Provides technical input to all standards development via various committees of StanSA

Eurolab

As an affiliate member of Eurolab, the NLA is pleased to advise its members of the following International events:

European Meeting on Fire Retardation & Protection of Materials. 7-9 September, Berlin <<http://www.frpm05/bam.de>>

Metrology Symposium Croatia. 26-28 September, Croatia. <<http://ms2005.org>>

Laboratory Competence, 3-5 November, Croatia. <<http://www.cro-lab.hr>>

For further information regarding Eurolab, please visit their web site at <<http://www.eurolab.org>>



INTERNATIONAL REPORT

Malcolm Smith

Deputized for Klaus Jaeger at the EUROLAB General Assembly in Bilbao, Spain.

- Met with Seton Bennett to discuss enhancing NCSLI's participation within EUROMET.
- Spoke with Prof Mladen Borsic about IMEKO.
- Communicated with Charlie Motzko concerning NCSLI promotion of the November 2006 International Conference on Metrology in Israel.
- Met with Jesse Morse to discuss working links between International and Marketing.
- Jeff Gust will attend the EUROMET General Assembly in Varna, Bulgaria.
- Klaus Jaeger will attend the 12th International Metrology Conference in Lyon, France.

COMMITTEE NEWS

ARCHIVE COMMITTEE

Jim Allred

The Archive committee continues to look at the best way to make NCSLI historical information easily accessible and searchable to its members. As documents and pictures are moved to electronic media, this committee would like to know what members would like to see in the archive database. Information dates back to 1960 and includes meeting minutes, members list photos, and in later years conference proceedings. We invite you to view a summary of Historical events

Here is the link to the NCSLI History search page:
<http://www.ncsli.org/welcome/history_search.cfm>

You can get to this page from the NCSLI Homepage by clicking "Welcome" in the left-hand menu, and then "NCSLI History" in the left-hand menu.

Meetings

The Archive Committee will meet at the 2005 NCSL International Workshop and Symposium in Washington DC on August 8 from 4:15 to 6:00 PM in the Grant conference room. Everyone is encouraged to attend and share their ideas on the kinds of archival information that is most useful to them. Discussions will continue on probable methods for transferring existing paper records and information for electronic retrieval. The committee will continue discussion on the best location on the NCSLI web page for member access.

STANDARDS POLICY

Doug Sugg, V.P.

U.S. MEASUREMENT REQUIREMENTS

Jeff Walden

Join Our Conference Session

In pursuit of the 2005-2009 Goals and Objectives, the USMRC is pursuing several actions:

1. The USMRC is sponsoring a Panel Session for the Workshop & Symposium in August titled, "*The Calibration Paradigm in the Year 2020.*" The panel is scheduled as Session 2C, on Monday the 8th.

The panel will be made up of the following:

Panel Moderator: Chet Franklin, Computer Sciences Corp.,
Meas. Science Group

Panel Members: Jeff Walden, U.S. Navy Metrology
R&D Program Chair, NCSLI USMRC
Committee

Caroll Brickencamp, *The Pi Group*

Marc Desrosiers, NIST

Mladen Jakovic, *Croatian Metrology Society*

Dennis Swyt, NIST

Istvan Zoltan, *Budapest Univ. of Technology & Economics*
Dept. of Measurement and Information Systems

The website abstract reads, "Can we identify the calibration paradigm that will be in place in fifteen years? The premise for this panel is that there will be a major shift in that paradigm. The panel will be made up of people from both public and private sectors that are looking at and are concerned with the future of calibration.

Many business managers, particularly of the "bottom line" point of view, look upon calibration as an overhead expense. There is always a push on to lower overhead expenses. That issue, and the rapid advances in technology are necessarily driving changes in the ways we do business. What are the challenges and opportunities that will be facing the calibration community in 2020? The panelists will be asked to consider the basic question, "What is it that we can't do now, that if we could do would drastically change the calibration paradigm?"

Areas of discussion will include imbedded sensor networks, and questions such as: If I can't see it or touch it, how do I calibrate it? Wireless communications have just begun to mature, and will have an enormous impact on such thing as those sensor networks. How will the user know whether or not the data from these sensor networks is good data? Could it be that we will have instruments so stable that they won't require calibration during their lifetime? Will changes in design and manufacture create instruments that cost less to replace than it will to calibrate them? If we can buy a wristwatch that self-calibrates using a signal from a satellite, what else is possible? How can we trust the results of such activities? What will the Internet do for us? Attendees are encouraged to bring their questions, ideas and suggestions."

2. A tabletop display at the August Workshop & Symposium, promoting the value of the USMRC.
3. A revised survey, based in part on NIST inputs, has been developed. After committee review, it was sent to NIST for their review and comment. We are waiting for feedback. We have been discussing with Craig various plans for revising the looks of, and promotion of, that survey on the website, as well as improvements for gathering the inputs.
4. Following the activities of, and as much as possible participating in, NIST's "*Public-Private Initiative for the Future*" titled "*Roadmapping America's Measurement Needs For a Stronger Innovation Infrastructure.*" See the story in NIST NEWS, page 46.

CANADIAN MEASUREMENT REQUIREMENTS

Dave Stevens & Lorraine Yeomans

Dave Stevens was contacted and he stated that the Canadian Measurement Requirements Committee has been inactive.

GLOSSARY AND ACRONYMS

Emil Hazarian

The Glossary Committee is currently in the process of collecting suggested new entries to update and enrich the current Glossary edition with new terms reflecting domestic and international changes, such as those in VIM, GUM and ISO/IEC 17025 documents. Also, due to growing demand, we are looking at incorporating metrology terms and acronyms related with accreditation, statistics, etc.

All professionals and interested parties are invited to send new entries. Please send your proposed new terms to Emil Hazarian at the following address: <emil.hazarian@navy.mil>.

We already received suggestions for new resources from Robert Nickey (NSWC Corona) who pointed out the A.T.E. Solutions free dictionary offer. If you know of any publication, (document, books, standards) or other reference containing definitions of terms and acronyms in the fields of metrology, statistics, accreditation, uncertainty, etc. please feel free to send it to me at the above address. We would like to build a library of references and resources for the Glossary Committee.

MEASUREMENT SCIENCE AND TECHNOLOGY

Richard Pettit, V.P.

MEASUREMENT COMPARISON PROGRAMS

*James Wheeler
Al Teruel*

The committee has updated RP-15 "Guide for Interlaboratory Comparisons" and has sent it to the Publications Oversight Committee Chair, Mike Lombardi, for editorial review. When it is completed with the editorial review, it will be sent to the full committee for their review and comments. The committee received a request to develop a high-resistance Interlaboratory Comparison (ILC). The initial inquiry indicated a high cost at NIST for measurements both before and after the ILC at several voltage levels. We have initiated conversations through Belinda Collins to see if NIST can provide some assistance with the measurements or can work with NCSLI on this ILC. Most participants are US companies that obtain their traceability through NIST. These discussions are ongoing.

INTRINSIC & DERIVED STANDARDS

Dave Deaver

The Pressure working Group is in the process of updating the Pressure RISP-4 "Deadweight Pressure Gauges." While they have not been able to find the final electronic version of the document, a nearly final WordPerfect version has been converted to Microsoft Word including revising some fifty equations. Dick Pettit will now work with the Chair of the Publications Oversight Committee, Mike Lombardi, in order to determine how to approach the editorial review without a major rewrite.

The Committee is also sponsoring the next Josephson Volt Interlaboratory Comparisons. There will be several sub-pivot laboratories that will support the ILC and also intercompare their laboratory system with the new portable Josephson that has been developed by NIST. This will both tie the ILC to a National Metrology Institute (NIST) and give feedback to NIST on the performance of their portable Josephson system.

CHEMICAL METROLOGY

Burt Sutherland

Burt Sutherland attended the 2005 PITTCON Conference and continued the process of identifying new members for the committee and developing future goals for the committee.

DIMENSIONAL METROLOGY

Dr. Jim Salsbury

In response to many requests, the Dimensional Metrology committee has been officially formed. An ad hoc group has been informally meeting for the past few years at the NCSLI, MSC, and IDW conferences to determine the level of interest and to create a charter for the committee. But now the Dimensional Metrology committee is official as committee number 148, under the NCSLI VP of Measurement Science and Technology, Richard Pettit.

Kickoff Committee Meeting-August Conference

The Dimensional Metrology committee will be having its first official meeting during the upcoming NCSLI conference in Washington, DC. The meeting will be Wednesday, August 10 from 4:15 to 6:00 pm. We encourage anyone with an interest in dimensional metrology to attend.

The charter for the committee includes developing technical sessions for NCSLI conferences, identifying measurement requirements, interfacing with dimensional metrology standards bodies, introducing the committee activities to industry, and developing documents, tutorials, and recommended practices as needed by the dimensional metrology industry.

The committee is already active in achieving its goals. One of the four dimensional sessions at the upcoming 2005 NCSLI annual conference was created by the committee. In addition, the committee has already established itself as a liaison between NCSLI and ASME B89, the dimensional metrology standards body in the United States.

The committee has also identified a need for an NCSLI recommended practice (RP) in the calibration and uncertainty of measurement when using coordinate measuring machines (CMMs). The goal for 2005 is to make a serious effort at putting together a draft for the calibration of CMMs.

As the Dimensional Metrology committee is just now forming, if anyone would like to be included in future direct correspondence, please contact the committee chair, Jim Salsbury at 630-723-3619 or email at <Jim.Salsbury@mitutoyo.com>.

INDUSTRIAL PROGRAMS

Roxanne M. Robinson, V.P.

HEALTHCARE METROLOGY

Dave Walters

Dave holds at least 2 meetings per year and has been trying to get an FDA rep to attend one of his meetings. Rosanne Robinson is trying to find a rep through her FDA contact, Mike Olson. Rooms were secured for the Healthcare meetings during the Conference.

UTILITIES

Peter Buzzard

An ILC on pressure is just about completed and another is gearing up for RTD. Request was made for meeting rooms at the Conference.

AIRLINE METROLOGY

Vic Cleland

Vic tries to hold four meetings per year but budgets are tight and attendance is low. This committee is interested in the outcome of the revision to Z540 work and how it will relate to FAA M&TE.

TESTING LABORATORIES

Marlene Moore

Marlene is trying to organize a panel discussion during the conference to bring testing and metrology together. She hopes to hold her first meeting at the Conference.

DOCUMENTARY STANDARDS APPLICATIONS

Larry E. Nielsen, V.P.

Committee Reports:

LABORATORY EVALUATION RESOURCES

Vacant

Reactivation of this committee is being sought to develop a handbook to ANSI/ISO/IEC 17025:2005. This committee will also develop a handbook to the new Z540.X standard once completed. A potential committee chair has been identified.

LABORATORY FACILITIES

Dr. David Braudaway

Doug Cooper

Work is completed on an update to RP-14, Recommended Practice for Selecting Standards Laboratory Environments. This document is currently pending 170 V.P. review and forwarding to the Publications Oversight committee. Work continues on a new RP on verification of laboratory environments.

Report:

Verification of Laboratory Environments

Work continues towards a compendium document on laboratory

environment verification. An impromptu meeting was again necessary at the 2005 Measurement Science Conference with a number of overlapping assignments for many attendees; a full meeting is scheduled for the 2005 NCSLI Workshop and Symposium. A number of parts for this document are coming together at this point, written by experts in the field. Although these are targeted especially towards verification of specifications immediately after construction, they are also intended to give guidance and practical direction for all periodic re-verification of environment in laboratories.

Verification of Laboratory Shielding

A document has been written by Ray Howland, with introduction and an additional section on magnetic measurements by me. Up until now this document had just been used as a training document for personnel of the South Korean Standards Laboratory. So far we do not have such backup for other sections of the environment verification document. Request for this use was received; Ray and I agreed, and he did the training for the Koreans.

Selecting Standards Laboratory Environments

The most recent revision to RP-14 includes a section about making compromises in selecting environments, is expanded and includes notes concerning the decisions which are forced by available funding and/or needs of customers. The Humidity section is also changed to include interaction between temperature, pressure and humidity. For most laboratories, the pressure changes are not a serious problem but a mass measurement might occasionally be disrupted as a weather front moves through. More serious are chemical processes that require a number of hours or a day to complete. The question of whether to seal the laboratory is introduced and recommendation is made to seal the test humidity chambers instead. Structurally, complication of the laboratory/airlock makes sealing of the facility very difficult and costly.

We do note that RP -14 has now been translated into Russian.

METROLOGY PRACTICES

Dr. Howard Castrup

Work continues toward revision or development of RPs for calibration interval analysis, measurement decision risk analysis, SPC and Bayesian methods, metrology decision support analysis, and uncertainty analysis.

Report:

Calibration Intervals

RP-1, Establishment and Adjustment of Calibration Intervals is still under revision. A workshop meeting was held April 25 - 26 at the Doubletree Hotel in Tucson to identify and implement needed RP-1 changes. Don Wyatt of Diversified Data Systems chaired the meeting.

Measurement Decision Risk Analysis

Work during the last quarter consisted primarily of consolidating and updating risk analysis documentation from various sources -- principally, NASA Handbook 1342. This material, along with suggested changes in a draft decision risk RP outline, will be sent to subcommittee chair Karl Haynes for review.

SPC Methods

Work is still in progress on extending current ANOVA methods to cover part variation, equipment variation, reproducibility, repeatability and uncertainty growth. These efforts were reported at the Southern California regional NCSLI Measurement Technology Symposium held on March 23.

Decision Support

I am still reviewing a draft RP titled "Metrology Practices Decision Support Topics," submitted by Derek Porter of the Boeing Commercial Airplane Group.

Uncertainty Analysis

We are continuing to update RP-12, Determining and Reporting Measurement Uncertainties with GUM methodology and with methods and techniques that have emerged since the GUM's last publication. We are also continuing to develop additional examples involving multivariate and systems analysis methods and examples that explore sources of error that are either not addressed in the current RP or are given only peripheral mention. In addition, documentation of methods for acquiring, interpreting and using equipment specifications to estimate parameter bias uncertainty is still in-progress.

WRITING COMMITTEE

Jesse Morse

The committee has approved a new operating procedure and posted it on the NCSLI website, 174 committee page. They are currently working with ASTM and ASQ on joint adoption of ISO/IEC 17025:2005. Work continues on the new working draft of the latest proposal for replacing Z540.1-1994. Please see Jesse's detailed report (attached).

Report:

This has been a fairly active quarter, and began with a very full meeting at the 2005 Measurement Science Conference with 29 out of 34 members in attendance.

Three major activities have taken place this quarter:

1. The new committee operating procedure was distributed with letter ballot to gain committee majority approval. The ballot is now closed. The final tally is:

Interest	Affirmative With Comments	Affirmative with Comments	Negative with Comments	Abstain with Reasons
Accrediting Body	1	1		
Commercial Co.	6	2		
Consultant	4	1		3
Gov't Agency		3		1
Gov't Contractor	8			
Total Voted	22	4	3	1
Total Members	34			

The approved procedure is located on the 174 web page. It will be reviewed and updated annually.

2. We are currently working with ASTM and ASQ on a joint adoption of ISO/IEC 17025:2005. The secretariat is having regular teleconferences with both organizations. ASTM will submit the BSR and PINS on behalf of the joint adoption. The NCSLI 174 Committee is currently at ballot for this adoption, and this ballot will close May 4, 2005.

ASTM is going to ballot right now and ASQ is getting an approval to go to ballot, and should be going to ballot soon. ISO is currently at the 60.00 stage (i.e., prepress and review of final comments, with a projected completion date is June 2005).

3. Working Group 1 continues to develop the next proposed Z540 standard to be delivered to the consensus body for approval. At the committee meeting in January, the WG1 was asked to:
 - a. Continue with the approach outlined in WD 2.1 Z540.X presented at MSC 2005.
 - b. Resolve the issues raised by the ballot process and provide a report to the Committee Chair.
 - c. Produce an updated draft for Committee review and comment.

The Working Group has reviewed all ballot comments from the September 2004 ballot, and has reach agreement on the resulting critical comments.

A report on the ballot comment review results is being drafted by the WG1 for submittal to the Standards Writing Committee Chair.

ACCREDITATION RESOURCES

James Jenkins

Work is completed on RP-9, Calibration Laboratory Capability Documentation Guideline. This document was submitted to the Publications Oversight committee for editorial review on February 14 and was returned on April 4. Currently awaiting 170 V.P. review.

CALIBRATION PROCEDURES

Dale Varner

Work is completed on RP-3, Calibration Procedures. This document was submitted to the Publications Oversight committee for editorial review on February 15. This committee is seeking guidance from the board on future tasks/assignments. A potential committee chair has been identified to replace Dale who has indicated he wishes to move on following publication of RP-3.

MARKETING

Jesse Morse, V.P.

BENCHMARKING PROGRAMS

John Wade Keith, III

The 2005 NCSL International Benchmarking Survey closed on May 31. To achieve an appropriate statistical sample, we strove for at least 30% participation to provide the most accurate trend data for its members and the metrology industry. We are analyzing the data

and preparing a comprehensive report and presentation for the 2005 NCSL International Annual Workshop and Symposium. All session attendees will receive the complete report and presentation. A brief summary of results will be communicated in post-symposium editions of the NCSLI Newsletter and NCSL International website.

2005 NCSL International Benchmarking Survey Milestones:

- a. Members complete surveys: April - 31 May
- b. Last day to complete online benchmarking survey, 31 May
- c. Compile completed survey information, 06 June - 24 June
- d. Analyze data and develop report, 27 June - 29 July
- e. Benchmarking report presented at the 2005 Conference, 11 August

CONFERENCE MANAGEMENT

Carol Hockert, V.P.

2005 CONFERENCE DIRECTOR

Gary Jennings

Conference Report

Theme: Expanding the Frontiers of Measurement

The 2005 conference site is the Washington Hilton and Towers, in Washington, D.C. Registration is on-line and reservations can be made at the hotel either on-line or by phone. Registrations for the conference are coming in at the same pace as the last DC conference.

The Keynote speaker is Acting Director of NIST, Hratch Semerjian. Dr. Semerjian will speak on the topic of Expanding the Frontiers of Measurement. Other noted speakers include Mark Hurwitz, President of ANSI, and Greg Hahn, of Clean Comedians.

There will be 20 tutorials before and after the conference. Complete course descriptions and instructor bios are available on the website.

Translation services (Spanish only) are arranged for the Keynote, International Track and plenary sessions.

The exhibit space in Washington, DC is sold out.

The technical program has over 125 papers submitted. There will be a plenary session on Tuesday, Wednesday and Thursday afternoon. There will be six tracks during the entire conference, except during the plenary sessions, for the first time ever. Look for the new pocket guide, with better features such as color coding, page-per-day schedules, and clearly- marked maps.

The Member Delegate meeting will be held during the lunch on Tuesday. The Wildhack Award will be given at this time, and other recognition will be given to selected individuals and schools.

Barbara Belzer has been appointed the Entertainment Chair on the Conference Committee.

Conference Committee (see page 57):

Site Selection Chair - Tony Anderson

2006 Conference Director - Ed Pritchard

Exhibit Sales for 2006 Conference - Tom Huttemann/Craig Gulka

The 2006 Conference will be in Nashville, Tennessee. Over sixty exhibit booth spaces have already been sold for this event. For the 2006 conference, speakers who submit a manuscript by the deadline will pay a reduced registration fee of \$200 for the conference. All other speakers will pay the early bird rate - as they do now - if they do not submit a manuscript by the deadline. The Renaissance is the host hotel in 2006.



Harry Spinks, of Boston Scientific, is the 2007 Conference Director

2007 Conference

The 2007 Conference will be in St. Paul, Minnesota. Conference Director for 2007 is Harry Spinks, of Boston Scientific.

NCSLI LEGAL METROLOGY ADHOC COMMITTEE

Val Miller, NIST WMD/LMG

The 2005 State Laboratory Workload Survey has been completed with 98 % participation as of this writing. This bi-annual survey has typically required that numerous follow-up contacts be made with laboratories to convince them of the importance of submitting their laboratory statistics. I am happy to report, based on feedback from the co-coordinators, that this year's on-line survey format provided the quickest and smoothest survey to date. I would like to commend Craig Gulka and his staff for their excellent support both in posting the survey and in making it accessible to the coordinators. Without their assistance in this matter we would not have had the same success with the survey. Thanks Craig.

Thus far, no activity has occurred on the proposed updates to ASTM standards, E319, E898, E1270 and E617 on which the Legal Metrology Committee members had agreed to work. Conversations with Dr. George Rodriguez, E41.06 committee chair, have discovered that due to industry requests that have been forwarded to him, a committee to establish the scope of the E617 review and revision is being formed. Dr. Rodriguez is scheduled to meet with the NCSLI Adhoc Legal Metrology committee during our meeting in Washington, DC to discuss formation of an evaluation and review panel for E898 as well, so that updating of this document will also be started soon.

Val Miller, Adhoc Committee chair, is hosting a Legal Metrology technical session at the 2005 NCSLI Conference and has scheduled three speakers:

Committee News

LF. Eason, North Carolina Standards Laboratory, will present "*Gravimetric Calibration of Volumetric Standards With Capacities Exceeding Five Gallons,*"

Elizabeth Gentry, Oklahoma Standards Laboratory, will present "*2005 State Laboratory Program Workload Survey;*"

Jeff Gust, Quametec, will present "*Development of a Proficiency Testing Quality System for U.S. Legal Metrology Laboratories.*"

Planning for the formal meeting of the Adhoc Legal Metrology Committee at the 2005 NCSLI Conference has been completed. The agenda includes: 2005 State Laboratory Program Survey results, ASTM Update, NVLAP, OIML Update, Proposed changes to NIST HB44 and HB 130, Redefining the kilogram and other topics of interest related to Legal Metrology.

Charter (DRAFT)

Serve as a forum for information exchange among calibration and testing laboratory managers and staff on Legal metrology issues at both the national and international level. Provide communication and information for member organizations with regard to Legal metrology on topics of measurement traceability, uncertainty analysis, standards availability, documentary standards development and distribution, accreditation needs and requirements, benchmarking criteria and schedule, and interlaboratory comparisons. Work in conjunction with the Measurement Assurance Program Committee developing and supporting NCSLI-sponsored Interlaboratory Comparisons (ILC's) suitable for Legal Metrology laboratory participation. Provide point of contact information for formation of working groups to assist in development of OIML and ASTM standards.

EDUCATION & TRAINING

Georgia L. Harris, V.P.

Issues to Consider

Operating Principles for Strategic Roadmap - Policy Input (strawman). See the attached draft Operating Principles.

Draft Drivers/Challenges - see below for the attached drivers, challenges, and models that have been developed as the output of the January workshops and additional working sessions. Input and comments are requested. This material forms the basis for the questions we will ask of the participants at the August Conference.

Sponsorship Opportunities - Education & Scholarships. I will propose that we establish an Education & Training Sponsorship program for NCSLI. This will put a system in place to accept donations/sponsorships and grants that are designated for educational projects or dedicated to the general scholarships to schools or the Joe Simmons Memorial scholarship.

Strategic Roadmap Activities

January Workshop Notes - posted on the NCSLI website (from MSC Committee Meeting and Board Workshop).

Focus Groups: Teleconference, Meeting at NIST.

Draft Strategic Roadmap - will be included in conference proceedings.

TRAINING RESOURCES

No designated chair

A Working Group is being formed to populate the Training Information Directory. Craig has been updating the website to allow Training Administrators to enter, edit, and approve all entries. The Directory was set up to allow entries from member delegates only and we would like this more widely available and accessible.

PERSONNEL QUALIFICATIONS,

Gloria Neely

Completed corrections to the Guide and submitted final draft to V.P. The Personnel Qualifications guide has been submitted to David Smith for final editing.

Began compiling data and began an outline for a Recommended Practice for On-the-job training.

WORKING GROUP

Chris Grachanen

Established core team for Metrology Job Description Initiative;

Worked with Craig on sending broadcast e-mail to NCSLI constituents for soliciting job descriptions. We have had a very good response and easily surpassed our minimum requirement of 25 each for Calibration Technician, Calibration Engineer and Metrologist (Thanks Craig!)

Working with Professional Examination Service on the extraction of commonalities for each job description - looking at 1st week in May for submittal to core team for review/comments/remarks.

EDUCATION LIAISON

Mark Lapinskes

Mark's report to the Board included School status reports and possible scholarship and sponsorship ideas.

Other Activities. Sent appointment letters for the 163 and 164 committee chairs with cc's to their supervisors.

Conference. Prepared abstracts and submitted information for 2 Conference Sessions.

Worked on developing an on-site Kiosk & Survey to gather additional customer-focused insight on metrology education and training.

Publications

- Personnel Qualifications Guide - discussed under 163.

SERVING THE WORLD OF MEASUREMENT: MEETING EDUCATION AND TRAINING NEEDS OF THE FUTURE

Georgia Harris

Identified Systemic Critical Drivers (April 2005)

Outreach

- The typical policy and decision makers, managers, and consumers have no understanding of metrology, quality, or the standards infrastructure or of its value and indispensability.
- There is no central "voice" for the measurement community.

Human Resources

- There is a critical ongoing loss of metrology expertise (in the U.S).
- The changing demographics in science, technology, and engineering, (aging staff, retirements, loss of military personnel, lack of interest in these careers, smaller next generation, higher pay and glamour in other fields), along with the lack of a clear career path in metrology, is causing a shortage of qualified staff that will worsen.
- There is a lack of educational depth and capacity in the less-experienced personnel at all levels.
- The current certification system (CCT) evaluates knowledge-based proficiency but not demonstrated competency.

Education

- There are a limited number of degree programs in "metrology" that support the educational needs of the measurement industry.
- More integration of metrology courses in other curricula is needed.
- There is inadequate collaboration and flexibility among providing institutions.
- There have been no recent curriculum assessments to ensure that the programs are meeting current needs; or plans for improvements and enhancements to meet future needs.
- There is no documented history of attempts at developing metrology programs.

Training

- There has been no systematic assessment of what training is available and what training is needed, although the perception is that there are gaps and inadequacies (for both instruction and instructors). There has been no needs analysis; no gap analysis.
- There is no system in place for assessing the quality or levels of technology, client needs, and instruction that are available.
- There is no central resource for information on metrology training.

Infrastructure

- There is no system to capture measurement knowledge and information and ensure its availability as needed.
- There is no system that links upcoming technology trends with methods for ensuring that people are trained to support it.
- There has not been a coordinated forum for ensuring that the right people and resources are brought together to ensure that metrology staffing needs are met at all levels.
- There has not been a focused effort to ensure that funding for metrology education and training are available to meet the needs.

Draft Strategic Challenges (April 2005)

Objectives

1. Metrology & Standards Outreach. Ensure awareness of metrology, measurement sciences, and needs for calibration and standards in such a way that it is readily recognized by organizational managers and the general public.
2. Career Opportunities. Ensure that clear career paths are identified and communicated as widely as possible and to ensure that labor statistics are tracked and available.
3. Personnel Qualification. Ensure that appropriate methods or systems are in place to provide appropriate recognition and credibility for the metrology professions.
4. Metrology Education. Provide multiple forums for metrology educators to interact, and to encourage sharing of ideas and resources, and to help ensure that stakeholder educational needs are met.
5. Training Resources. Ensure that information and resources on metrology education and training are widely available and to ensure a high level of awareness.
6. Training Opportunities. Ensure development, implementation, and recognition of real-time (fast-response) metrology training.
7. Training Assessment & Certification. Develop and provide an infrastructure for assessment (and certification) of metrology training courses.
8. Knowledge Management. Ensure that critical infrastructure needs for ongoing knowledge management are in place and flexible enough to capture and widely disseminate metrology expertise.
9. Technology Trend Analysis. Ensure identification of potential education and training needs in support of measurements and standards needed for new technology infrastructures.
10. Collaboration. Ensure that the entire metrology community and stakeholders work together to gain synergy in achieving our goals.
11. Funding. Ensure that adequate resources are available to support metrology education and training.

REPORT FROM THE EUROPEAN COOPERATION IN METROLOGY (EUROMET)

Seton Bennett

EUROMET General Assembly in Bulgaria

The principal event in the EUROMET calendar was the General Assembly, attended this year by some 60 delegates in Varna on Bulgaria's Black Sea coast. It was a particular pleasure to welcome NCSLI Executive Vice-President Jeff Gust.

The formal business of the General Assembly, in the delegates' session, included approval of the secretariat budget for the coming year as well as a number of elections. Michael Kühne from Germany's PTB was elected to be the next Chairman of EUROMET for the period 2006-2008 and Ed deLeer from NMI in the Netherlands joins the Executive Committee. Michael will be coming to the NCSLI Conference in Washington this year, where he will chair a session as well as giving a paper.

In addition to the four new Technical Committee Chairs already elected by e-mail ballot, Attilio Sacconi was elected to Chair the newly created Technical Committee for Quality (TC-Q), which replaces QS-Forum, with responsibility for reviewing NMI quality systems. Following 5 additions to the EUROMET membership last year, the General Assembly welcomed Croatia and Serbia & Montenegro as members this year, on the basis of an evaluation by the Executive Committee.

These elections highlighted the need for EUROMET to agree on some formal voting procedures, which are needed for the adoption of important documents as well as for elections and appointments. The possibility of future changes to the status and structure of EUROMET makes it all the more important that we agree how such changes would be adopted, and the General Assembly took a first look at proposals from the secretariat.

The heart of the General Assembly is always the reports from the Technical Committee Chairs, with clear evidence this year of a shift towards more research collaboration, now that most of the CMC evaluation work is behind us. Some TCs have established Working Groups to identify potential projects and there is a general expectation of more collaborative research in the iMERA years ahead.

I was also able to confirm to the General Assembly that I shall sign the Memorandum of Understanding with EA (the European Accreditation cooperation) in June. This will lead to closer ties between the two organisations in the future as we discuss issues of common interest, including the relationship between NMIs and NABs, the publication of guides for calibration laboratories and the links between key comparisons, supplementary comparisons and regional ILCs. BIPM Director Andrew Wallard reported to the General Assembly on the ongoing discussions between ILAC and BIPM, and the MoU with EA will allow us to extend these discussions at the regional level.

Many more topics were discussed, at the wonderful social events organised by our Bulgarian hosts as well as in the Assembly sessions. The sunshine and the relaxed atmosphere of the hotel helped to make this a memorable event for EUROMET.

That being said, a newsletter editing policy has never been written down. It has pretty much just evolved, and since the same editor has been doing it for 26 years, I often wonder if the NCSLI Newsletter personality has just become a long shadow of me? My general editing principle is that although our members are important world-class organizations, we are still an organization of people.

My dealings with each of you who furnish material and reports have convinced me that our member delegates and associated managers and leaders are a wonderful mix of international personalities. I have found that almost all of you have a terrific sense of humor, even in your technical dealings. In fact, I think our meetings and conferences have demonstrated that ALL OF YOU have good senses of humor.

So I have tried to give the newsletter a personality of its own, which should match up with the central personality of NCSLI itself. I believe that NCSLI has succeeded in its mission for decades now, simply because all the people who represent their companies and organizations have a personal dedication to make the NCSLI mission work for the benefit of world metrology, and in turn, their organization.

In the newsletter, I try to maintain the reports more or less in the same vernacular and style of the writer. Some are concise, some verbose, but they all have personality. I like that. I maintain the unusual spellings of the UK, and as much of the style as I can of other national cultures. And yet, I try to encourage you writers to get away from your engineering education style of third-person, passive, format (. . . the meeting was opened by. . .) to a more-friendly, first person, active (. . . he opened the meeting with. . .). Remember your high school English class? I know that is tougher for all you writers from outside the U.S.

I tolerate some redundancy in the regional reports, recognizing that some intrepid authors travel to many cities to give the same presentation. I feel it is important that each region treat their meetings as they see them.

For picture captions, I have some feedback that I may be too flippant with the stories contained in the pictures, and the captions I write. You should know that I have a somewhat "warped" a sense of humor that even finds some humor in serious issues. So, I have encouraged every supplier of pictures to write their own captions. That accomplishes two things; I don't have to ask for actual names of people shown, and I don't have to speculate what the photo is about, interesting though it may be.

We should know that ALL of our industrial volunteers donate considerably of their own personal and family time to the success of our organization. Their companies fund considerable travel and expense willingly. THIS NCSLI IS HARD WORK. And I, for one, appreciate every one of you volunteers in the roster pages in back. Nor should we forget all of their committee and regional helper people whose pictures don't even show up in the roster, where they are represented by their chairmen.

Over the past 26 years, I think I have surveyed our readers three or four times, and the message seemed to be "steady as she goes." I hope we are meeting the needs of today's new business culture and its new personal stresses. That's where you the reader comes in. Don't feel shy about getting on your email and letting me know where I did something stupid, or areas where you need more help. In a real sense, you readers should be the ones controlling the editing style that I carry out.

The result of all this? In addition to all our activity reports, in this issue we get the Life Profile of Jack Ferris (page 24), Charlie Mays' farewell retrospective (page 27), and "A Day in the Life of Guy Fleming" (page 33).

John L. Minck
Editor

SCENES FROM THE BOULDER BOARD MEETING



The 2005 NCSLI Board gathers outside our Global headquarters building in Boulder.



With the April Colorado weather cooperating, President Harry Moody and others demonstrate their barbecuing skills.



NCSLI President Harry Moody joins Exec V.P. Jeff Gust and Treasurer Jack Ferris in consulting their brains, the ever-present laptop computer. International V.P. Malcolm Smith looks on.



Several more relatively new faces at the Board meeting. Dana Leaman is Mid-Atlantic coordinator but also active with A2LA inputs. Lonnie Spires is relatively new to the Board activities.



Since this Board meeting was called for the NCSLI headquarters, our business office staff was able to join in the event. (l to r) Larry Johnson, Doris Schaffner, Joan Wilshire, and Jeff Franklin, the new NCSLI webmaster.



I'd better make sure that my new boss gets his pix in the newsletter as much as possible. Tom Wunsch and Doug Sugg work during the break.

NEWS FROM THE NMIs

NIST NEWS

NEW MEMBERS APPOINTED TO NIST POLICY ADVISORY GROUP

Acting Director Hrach Semerjian, of the NIST, has named three distinguished industry and business experts to serve on the Visiting Committee on Advanced Technology (VCAT), the agency's primary private-sector policy advisory group. The new VCAT members, who will serve three-year terms until Jan. 31, 2008, bring the body's number to 14.

Starting their service on the VCAT are John F. Cassidy Jr., senior vice president, science & technology, United Technologies Corp. (UTC), Hartford, Conn.; E. David Spong, vice chairman, ChangeAgent, Inc., Dallas, Texas; and W. Wyatt Starnes, chairman and chief executive officer, SignaCert, Inc., Portland, Oregon.

The VCAT was established by Congress in 1988 to review and make recommendations on NIST's policies, organization, budget and programs. Other VCAT members are: April M. Schweighart (VCAT chair), retired, Motorola, Inc.; Scott C. Donnelly, General Electric Company; Gary D. Floss, Bluefire Partners, Inc.; Deborah L. Grubbe, (VCAT vice chair) BP p.l.c.; Lou Ann Heimbrook, Merck Research Laboratories; Donald B. Keck, retired, Corning Inc.; Edward J. Noha, CNA Financial Corp.; Juan M. Sanchez, University of Texas at Austin; Thomas A. Saponas, retired, Agilent Technologies; James W. Serum, SciTek Ventures; and Robert T. Williams, Caterpillar Inc.

For more information, see <www.nist.gov/director/vcat/>.

NEW INITIATIVE WILL MAP U.S. MEASUREMENT NEEDS

An initiative to "roadmap" the nation's future measurement needs was announced May 11 by the NIST. Advances in such measurement capabilities are basic to technological innovation, U.S. industrial competitiveness, safety and security, and quality of life.

"The nation's measurement system is a vital element of our innovation infrastructure," NIST Acting Director Hrach Semerjian said during testimony before the House Subcommittee on Environment, Technology, and Standards. "The goal of this very important initiative, which will be undertaken in close cooperation with the private sector and other agencies, is to ensure that the nation's highest-priority measurement needs are identified and met. We need to be certain that the U.S. measurement system is robust so that it can sustain America's economy and citizens at world-class levels in the 21st century."

Semerjian was testifying on the use of standards as barriers to export markets. Test and measurement methods are critical for businesses to demonstrate compliance with regulatory requirements and

standards, which are the specifications that define the features, performance levels, compatibility and other attributes of products. The Organization for Economic Cooperation and Development has estimated that standards influence up to 80 percent of world trade.

The comprehensive, NIST-facilitated initiative, *"Roadmapping America's Measurement Needs for a Strong Innovation Infrastructure,"* will result in a first-ever evaluation of the breadth, depth and overall health of the U.S. measurement system. The final report, expected in early 2007, will identify priority measurement infrastructure needs across industry and the economy, recommend steps to address them and point out the consequences of inaction.

For further information, see <www.nist.gov/public_affairs/releases/usms_nist.htm>.

Questions and Answers

What is the U.S. measurement system and why is it important?

- Accurate, dependable measurements are crucial to innovation in the United States; commercial exchange; national security and defense; and protection of health, safety, and the environment.
- Our U.S. measurement system—the complex of methods, instruments, entities, institutions, and standards, both physical and documentary, involved in measurements of products and processes significant to the economy, security, and quality of life in the United States—enables all of the above.
- The scope of the system is broad, ranging from measurements conducted by and for government agencies, in manufacturer-owned and independent laboratories, in the field and on the factory floor, and incorporated into product and process standards.

Why do we need to work together to ensure the health of the system?

- Increasingly, our complex, technology-driven economy is creating new measurement challenges: the next-generation measurements needed to support the development and broad application of information science and nanoscale materials and devices, improvements in the efficiency and quality of U.S. manufactured goods, and the protection of the homeland. At the same time, other nations and regional blocs are seeking to turn their more coherent, centralized systems into a trade advantage.
- Now more than ever, in an environment of increasingly scarce resources and many competing demands, we need to join together to create a comprehensive mechanism to anticipate future measurement infrastructure needs and to make informed strategic choices about how best to invest resources to achieve the greatest impact.
- While a broad range of organizations have a stake in a strong and forward-looking U.S. measurement system, it is the job of the National Institute of Standards and Technology (NIST) to ensure that the U.S. measurement system is healthy and capable of serving U.S. institutions and citizens in the 21st century.

What will NIST do?

- NIST will lead a regular assessment of the state of the U.S. measurement system, working with other system stakeholders to identify key needs and gaps in the system and how these should be addressed. NIST will advise the Administration and Congress on what needs to be done to meet the most pressing needs of the country and the consequences of not acting.
- A key product of this process will be a high-level report laying out critical measurement infrastructure needs for the United States, looking out over at least the next decade. All customers of and participants in the U.S. measurement system are invited to contribute to the development of this report at a U.S. Measurement Summit, to be convened by NIST in early 2006. The summit will provide a venue for focused cross-sector, cross-technology discussion and debate among key customers and stakeholders on priority measurement system needs and how to address them.
- In the run-up to the Measurement Summit, NIST will reach out to top customers and stakeholders in the U.S. measurement system, hold focused workshops on key technology areas, and coordinate the development of forward-looking white papers focusing on critical measurement needs and system-level gaps. NIST will work with other organizations to develop a plan to address the most important issues. All of this information will be combined into a comprehensive U.S. measurement infrastructure roadmap.

What are the benefits to the nation and to system stakeholders?

- Roadmapping the nation's priority measurement infrastructure needs and solutions to those needs will enable us to anticipate the next decade's strategic measurement challenges and to meet those challenges with more coordinated responses. All system stakeholders will be involved in ensuring the continued health of the U.S. measurement system, while fully understanding the consequences of not addressing specific needs.
- This roadmap will be extremely valuable to leaders in industry and government in providing an accurate assessment of what it will take to ensure that the United States has a measurement system equal to the many demands of the new century.

For more information, visit the initiative's Web page at <www.nist.gov/usms>. Send questions and comments to <usms@nist.gov>.

EXPERTS URGE REDEFINITION OF THE KILOGRAM

It's time to replace the 115-year-old kilogram artifact as the world's official standard for mass, even though experiments generally thought necessary to achieve this goal have not yet reached their targeted level of precision. That's the conclusion of an upcoming Metrologia journal article* authored by five eminent scientists from the United States, United Kingdom and France that was discussed at a scientific meeting of the Royal Society of London on Feb. 14-15.

The authors of this Metrologia paper suggest replacing the kilogram artifact—a cylinder of platinum-iridium alloy about the size of a plum—with a definition based on one of two unchanging natural phenomena, either a quantity of light or the mass of a fixed number of atoms.

The five authors, including three from the U.S. National Institute of Standards and Technology (NIST), one from the University of Reading in the United Kingdom, and a former director of the Bureau International des Poids et Mesures (BIPM) near Paris, conclude that redefining the kilogram now in terms of an invariable property of nature rather than a material object could immediately have many benefits. For instance, it would improve the precision of certain electrical measurements 50-fold and would enable physicists to make more precise calculations in studying the fundamental quantum properties of atoms and other basic particles. The paper outlines how this could be accomplished without impairing the current international system of mass measurements.

For further information see <www.nist.gov/public_affairs/news-fromnist_redef_kilogram.htm>.

* I.M. Mills, P.J. Mohr, T.J. Quinn, B. Taylor, E. Williams, "Redefinition of the kilogram: A decision whose time has come," Metrologia, expected online publication, Feb. 2005.

NEW WEB SITE 'DRILLS DOWN' INTO GOVERNMENT STANDARDS

Protracted and, sometimes, fruitless searches for government-applied technical standards may soon be a thing of the past. A new Web site, Standards.gov, provides businesses, other organizations and interested citizens with a direct portal to sources of information on the thousands of specifications that government agencies reference in regulations or use to guide their purchasing decisions.

The NIST launched the new site to further the government's progress in using private-sector standards in lieu of agency-unique specifications, whenever practical. Under the National Technology Transfer and Advancement Act (NTTAA), NIST leads and coordinates federal, state and local government efforts to increase use of voluntary consensus standards over in-house, proprietary standards.

From basic tutorials to a searchable database of standards referenced in federal regulations, the Web site offers a broad perspective on the government's complex standards landscape. Using Standards.gov, visitors can quickly home in on their particular interests, be it standards incorporated into drinking water requirements, specifications for military equipment, guidelines for respiratory protection in the workplace or other topics.

Links to standards-related Web sites maintained by 12 federal departments and independent agencies are now featured on the site. This number is likely to grow as other governmental units follow suit and post standards information pertinent to their missions and operations, says NIST's Kevin McIntyre, who led development of Standards.gov.

In all, nearly 30 departments and agencies are members of the NIST-led Interagency Committee on Standards Policy (ICSP), responsible for implementing NTTAA requirements. Each year, these federal units report on their standards-related activities. NIST compiles and summarizes these submissions in annual reports that are available on Standards.gov.

McIntyre says the new Web site continues to be a work in progress. He and his team welcome suggestions for improvements and new

News from the NMIs

features to add. Recommendations and other comments can be submitted via the "contact us" page on the site.

To visit Standards.gov, go to < <http://standards.gov/> >.

APRIL FORUM REVISITED NATIONAL STANDARDS STRATEGY

A public forum for comment on the initial draft of a revised National Standards Strategy (NSS) (retitled the U.S. Standards Strategy), was held on April 15, 2005, at the Department of Commerce in Washington, DC. First adopted by the American National Standards Institute (ANSI) in 2000, the NSS is a strategic framework to guide private and public sector participation in standards-related activities affecting trade, market-access, consumer welfare, and other priority interests and issues.

During the past year, more than 100 members of the standards and conformity assessment community have reviewed the strategy. They have proposed revisions intended to respond to new issues and anticipated trends, domestic and international. The NIST has contributed to the ANSI-led review process and hosted the April 15 forum in conjunction with ANSI. To learn more, go to <www.ansi.org/uss>.

WORKSHOP ON SYNCHRONIZATION IN TELECOMMUNICATIONS

They say timing is everything. This is particularly true in telecommunications where synchronization of networks and delivery of data packets are critical.

The annual Workshop on Synchronization in Telecommunications Systems, sponsored by the NIST and the Alliance for Telecommunications Industry Solutions (ATIS), took place in May, 2005, in Broomfield, Colo. A broad range of topics from synchronization fundamentals to next-generation networks for both wired and wireless systems were covered.

The three-day workshop included tutorials, lectures and panel discussions and provided educational and networking opportunities for network operators, strategists, design engineers, system architects and synchronization planners from the wireline, wireless, enterprise and utilities sectors. For more information on speaker applications or event registration and logistics, visit <www.boulder.nist.gov/time-freq/seminars/ATIS.2005.html>.

HOW LONG SHOULD DIGITAL STORAGE MEDIA LAST?

Knowing that CDs and DVDs will last for a certain number of years is critical to many government agencies, as well as to hospitals, banks and other organizations that store massive amounts of vital data on optical disks. But, how long is long enough?

To help the NIST develop a standard test to estimate the longevity of recordable optical media, the DVD Association (DVDA) and the

Government Information Preservation Working Group (GIPWoG) are asking federal agencies and other organizations to answer a very brief survey concerning the longevity of optical media. To participate, see <www.itl.nist.gov/div895/gipwog/index.html>.

The test being developed by NIST will not measure actual longevity but will determine the archival quality of the media and whether it will last at least a minimum number of years. The NIST researchers recently tested how well recordable optical disks made with different manufacturing processes held up when exposed to high temperatures, humidity and light levels. They found that some disks can be expected to store data reliably for several decades. (A NIST research paper describing the study "Stability Comparison of Recordable Optical Discs," can be found at <www.itl.nist.gov/div895/gipwog/index.html>.

PORTABLE RADIATION DETECTORS GENERALLY MEET STANDARDS

Portable radiation detectors generally perform well enough to meet new consensus standards but provide inaccurate readings for certain types of radiation, according to recent tests by the NIST.

The results, reported in the May issue of the journal *Health Physics**, are based on NIST tests of 31 commercial detectors, including hand-held survey meters; electronic personal alarming detectors (similar to pagers); and radionuclide identifiers (specialized devices that can identify specific radioactive materials). A number of federal, state and local agencies are using such instruments as part of homeland security-related efforts to detect and identify radioactive materials.

Researchers compared the devices' exposure rate readings to NIST measurements for different energy and intensity levels produced by NIST's calibrated gamma ray and X-ray beam lines. The responses of the majority of the detectors agreed with NIST-measured values, within acceptable uncertainties, for tests with gamma rays. This performance meets requirements established by new American National Standards Institute (ANSI) standards, adopted by the Department of Homeland Security (DHS) in 2004. However, there was a large discrepancy between most detectors' readings and the NIST values for the lowest-energy X-rays. For instance, readings by 14 detectors were roughly 40 to 100 percent below the NIST value. The deviations were much larger than those stated in manufacturers' specifications.

The tests are intended to help first responders and government agencies make better use of existing equipment and acquire the right equipment for emergency response, and to encourage manufacturers to better design and characterize their instruments. The tests were performed as part of the NIST program to support the development of the new ANSI standards (see <www.nist.gov/public_affairs/factsheet/radiation_detector_standards.htm>) as well as to support the NIST Office of Law Enforcement Standards and DHS in testing detectors for their use by first responders.

*L. Pibida, R. Minniti, M. O'Brien, and M. Unterweger. "Test of Radiation Detectors used in Homeland Security Applications." *Health Physics*. May. Vol. 88, Number 5. Posted online April 13, 2005.

NIST METHOD IMPROVES TIMING IN OSCILLOSCOPES

A new method for correcting common timing errors in high-speed oscilloscopes has been developed by researchers at the NIST. The method improves the accuracy and clarity of measurements performed in the development and troubleshooting of components for wireless and optical communications, military radar and other technologies.

Oscilloscopes display graphical representations of electrical and optical signals as waves, showing how the signals change over time. These instruments often have inaccurate internal clocks that distort output patterns, and they also can exhibit random timing errors called jitter. These errors may lead, for example, to false detection of failure in a communications module that is actually working, or to increased electronic "noise" interference with measurements of microwave signals from radar.

The NIST method, based on an approach developed in laboratory experiments and implemented in freely available software, constructs an alternative time base. The software analyzes an oscilloscope's measurements of both a signal of interest and two reference waves that are offset from each other. The reference waves are generated by an external device and are synchronized in time with the signal being measured. Measurements of the reference waves are compared with a calculation of an ideal wave to produce an estimate of total time errors due to distortion and jitter. These errors then can be corrected automatically for each measurement made by the oscilloscope.

The NIST correction method can be applied to older standard equipment, can correct time records of almost any length and can be applied to electromagnetic signals of almost any frequency. It also provides the user with an estimate of the residual timing error after the correction process has been completed. The Timebase Correction software package is available free of charge at www.boulder.nist.gov/div815/HSM_Project/Software.htm.

NIST QUALITY SYSTEM ACTIVITIES

NIST conducted its first Management Review of the NIST Quality System for Measurement Services in January. Division chiefs of the technical divisions that provide the services reported on the status of their quality system. They also reported on the standard criteria of the Management Review including client feedback, changes in volume and type of work, the assessment process, resources (equipment and people), and the suitability of policies and procedures. This annual activity is a way to assess to health of the quality system and determine the crosscut needs of the laboratories that provide NIST measurement services.

NIST's quality system assessment process continues. This year the focus is on the reference material areas. In February an assessment was started for the Analytical Chemistry Division (ACD). ACD is the largest provider of reference materials at NIST; with more than 1,000 calibration and measurement capabilities listed on the BIPM key comparison database <http://kcdb.bipm.org/>.

Progress continues for the quality system for measurement areas within the Time and Frequency Division. The on-site assessment took place in December and the corrective actions are now complete.

The assessment review board at NIST will now review the assessment records and process. It is expected that the quality systems for time and frequency along with the SRM areas of amount of substance from the Analytical Chemistry Division will be reported to the SIM quality system task force in the fall of this year.

Funding for 1-year support of Measurement Service development projects was awarded to the NIST labs from Acting Director Hratch Semerjian. The following list contains the description of the funded projects:

- Develop a check standard database for S-parameter and power calibration services
- Improve ultra-high resistance calibrations (>1T ohm)
- Establish blue and ultraviolet laser radiometry calibrations
- Develop a Scanning Electron Microscopy (SEM)-based method for imaging microstructures to support NIST SRM cement characterizations
- Establish pyrometer-based temperature standards and black body sources for the scale above the freezing point of silver
- Characterize nanoindentation for SRM materials: amorphous oxide glasses
- Harmonize charpy impact energies for international comparisons
- Improve data acquisition and computer control for NIST Rockwell Hardness standardizing machines
- Improved methods for uncertainty calculations in frequency traceability
- Utilize open-source statistical tools for uncertainty calculation in complex measurements
- Launch the next generation of NIST Thermodynamic Tables
- Investigate the delivery of gas concentration standards using the intrinsic standards approach

Contact: Sally Bruce, (301) 975-2323, sally.bruce@nist.gov

EEEL DEVELOPS METHOD FOR ESTIMATING MULTIPLE REFLECTION ERRORS IN SPHERICAL NEAR-FIELD MEASUREMENTS

Multiple reflections long have been recognized as an important source of errors in antenna near-field measurements. Mike Francis, Jeff Guerrieri, Katherine MacReynolds, and Ron Wittmann of the Electromagnetics Division have developed a simple method for estimating uncertainties due to multiple reflections between the test antenna and probe in near-field spherical-scanning measurements.

To estimate uncertainties in far-field parameters due to multiple reflections, the test antenna is measured by scanning the probe over two spheres whose radii differ by a quarter wavelength ($\lambda/4$). This estimate was compared to that obtained with a reduced data set (containing all values of θ but only a few values of ϕ). In these tests, it was found that measuring only two ϕ cuts sufficed to obtain root mean square uncertainties within 1 dB of those obtained using full-sphere data. This efficient approach to error estimation should improve accuracy and reduce measurement time by 50 percent or more.

Contact: Mike Francis, (303) 497-5873, francis@boulder.nist.gov.

MOST ACCURATE DISPLACEMENT MEASUREMENTS EVER MADE DEMONSTRATED

The accurate measurement of very small distances is essential to nanotechnology and industries such as semiconductor fabrication. A technique for measuring displacements with a precision of 10 picometers (about 1/10th the size of an atom) has been designed to work over a range of 50 mm and recently demonstrated over 25 mm. The corresponding relative uncertainty is 4×10^{-10} , the smallest ever reported.

The method employs Fabry-Perot interferometry and offers some unique advantages over previously used approaches. The key idea is that the resonant frequencies of two modes of a scanning Fabry-Perot cavity are measured simultaneously, using optical techniques to measure the absolute frequency and radio-frequency techniques to measure the difference frequency.

The associated measurement redundancy imposes a strict bound on many systematic sources of error, and allows one, for example, to distinguish a cavity containing 654,321 half-wavelengths (here $\lambda = 633$ nm) from one containing 654,320 half-wavelengths. In addition, the spatial filtering provided by the resonant cavity provides control over the exact geometry of the laser light, which is not possible in more conventional approaches and which is essential when making measurements with this level of accuracy.

Another remarkable aspect of this technique is that the light may be extinguished or blocked as the target is moved, which is not the case in the traditional approach where sinusoidal fringes are counted during the motion. Finally, the Fabry-Perot cavity under interrogation is located remotely from the laser system and coupled via an optical fiber link, making the system particularly attractive for remote sensing applications.

Contact: John Lawall, (301) 975-3226, <john.lawall@nist.gov>.

ULTRAVIOLET CALIBRATIONS PERFORMED

The Synchrotron Ultraviolet Radiation Facility (SURF III) currently is the only place in the world where ultraviolet radiation sources can be calibrated directly by comparison to synchrotron radiation, which provides better measurement uncertainties. These calibrations are based on the calculability of synchrotron radiation.

The first spectral irradiance calibration of a Hamamatsu deuterium lamp within the NIST calibration program was performed at SURF in late November 2004 with great success. The calibrated lamp will be used by Hamamatsu, one of the most important ultraviolet source manufacturers in the world, as the primary standard to subsequently calibrate lamps that are sold as "*NIST traceable*."

Contact: Uwe Arp, (301) 975-3233, <uwe.arp@nist.gov>.

NIST FORCE CALIBRATIONS ENSURE PROPER OPERATION OF AIRCRAFT ENGINES

The NIST Force Metrology Laboratory completed calibration of a

secondary standard load cell system consisting of a 222.4 kN (50,000 lbf) capacity load cell and a dedicated indicator for Rolls Royce Canada Limited of Quebec, Canada. Rolls Royce Canada performs numerous jet engine thrust measurements for worldwide customers to verify the proper operation of the engine under test following overhaul or repair. The company provides service for more than 123 different types of engines powering commercial and military aircrafts around the world.

The load cell system calibrated at NIST serves as the "master" used to calibrate two other "working" load cell systems that are installed in one of two jet engine test stands in their laboratory. This test stand will service engines in the maximum thrust capacity range of 311 kN (70,000 lbf), which, typically, are found on a Boeing 747 type of aircraft. To accommodate seasonal weather changes in Canada, the Rolls Royce procedure is to heat the load cells within the test stands by use of a heating blanket wrap around the load cell. The load cells are maintained at 35 degrees Celsius while in use and during calibration in the NIST force deadweight machine. The uniqueness of using this blanket while in use in the test stand helps to minimize any thermal gradients within the load cell that would affect the Rolls Royce specification of ensuring 0.25 percent repeatability for the overall system.

In the past, Rolls Royce Canada Limited relied on the force metrology laboratory at the National Research Council (NRC), the Canadian counterpart to NIST, to perform their yearly force calibration requirements. However, due to attrition and cost-cutting measures, the NRC force metrology calibration service no longer exists. Thus, based on the high level of confidence that the NIST measurement performance would meet their needs, Rolls Royce Canada chose NIST to continue to provide calibrations that are traceable to a national laboratory.

Contact: Sam Ho, (301) 975-6648, <samuel.ho@nist.gov>.

Quick Links

The Future of the Semiconductor Industry. A conference focussing on how to keep the \$87 billion U.S. semiconductor industry competitive in the 21st century was held in March. Semiconductors already underpin the electronics industry and help drive the global economy. They will become even more influential as integrated circuits become the building blocks for emerging technologies, such as nanotechnology, that will expand the economy in the future. The need for new kinds of collaborations and partnerships, and the problem of growing R&D costs, were among the issues discussed at the 2005 International Conference on Characterization and Metrology for ULSI Technology, at the University of Texas at Dallas in Richardson, Texas.

The conference, the fifth in a series that began in 1995, focused on summarizing major issues, giving critical reviews of important measurement techniques needed by the industry, and highlighting new metrologies needed as the industry moves to silicon nanotechnologies and beyond.

NIST was one of nine sponsors of the conference. Details are available at <www.eeel.nist.gov/812/conference/>.

NIST Smoothness Web Site Adds 3-D Analysis Tools. A tiny irregularity in a product's expected smooth surface can mean a multimillion dollar loss for manufacturers of everything from high-performance wind tunnels to precision optical devices. New features in a NIST Web site, however, should make quality assurance in such industries a bit less fretful.

The addition of three-dimensional surface analysis capacity to the feature menu of the free, interactive NIST Web site should be especially useful to the mechanical parts, semiconductor and optical industries where 3-D surface smoothness is key to high-efficiency performance. The NIST Web site enables manufacturers to check the accuracy of measurement software used to verify the smoothness of product surfaces. Until this month, the Web site, called "*Surface Metrology Algorithm Testing System (SMATS)*," was limited to two-dimensional surface analysis.

A new circular fit measurement feature on the 2-D page of the website also allows manufacturers of bearings and other cylindrical or spherical products to check for errors in software packages of the instruments they use.

The NIST virtual surface calibration Web site is available at <http://ats.nist.gov/VSC/jsp>.

I visit up to thirty labs a year and I find a common theme in a lot of the labs. There is an increasing trend for metrology technicians to hook up instruments, push a button, and wait for a computer print-out. The computer tells them if there is a problem or not. These practices show an excellent advance in technology and have made us better and faster calibrators than we have ever been. The downside is that the calibrators are losing the knowledge base of metrology and ability to make sound metrology judgments.

I never want to go back to the "good old days" but I feel that we as metrologists must guard against losing this metrology knowledge. We must continue to try to understand the theory of operation of instruments so we know if the computer is really giving us good data. A friend of mine keeps saying "read the book" which is still good advice.

One thing that NCSLI is doing to help out with this effort is that we are working with NIST to offer more train-the-trainer type courses that are designed to go into the theory of technical metrology. Also NCSLI has established our training center in Boulder where NCSLI members can attend metrology training to gain better understanding of the theories of operation. From the Board of Directors, Georgia Harris is developing the direction that NCSLI will take to give NCSLI members more opportunities in training. This thought process took most of the 25-mile trip.

Another realization that hit me on my float trip was the fact that I am so proud to be part of the metrology community. We metrologists have the ability to overcome our individual competitive business worlds and work together to help each other out. I recently attended a Region Meeting and the discussion involved a Laser Tracker system. A person from another company volunteered to help out so we could find the best way to use the measurement system. I think this ability to share knowledge is what makes our metrology community so special. I know our upcoming conference will allow you to find many groups of metrologists sharing information to help everyone involved be better metrologists.

Harry J. Moody
NCSLI President

NCSLI NEWSNOTES

INTERNATIONAL CONFERENCE ON METROLOGY

(Long Range Planning)

Tel Aviv, Israel

November 14-16, 2006

3RD INTERNATIONAL CONFERENCE ON METROLOGY Theme: Trends and Applications in Calibration and Testing Laboratories

Dear Colleague,

The 3rd International Conference on *Metrology - Trends and Applications in Calibration and Testing Laboratories* will take place November 14-16, 2006 in Tel Aviv. It is being organized, as were the previous two (May 2000 in Jerusalem and November 2003 in Eilat), by the National Conference of Standard Laboratories (NCSL International), Co-operation on International Traceability in Analytical Chemistry (CITAC) and the Israeli Metrological Society (IMS).

The International Measurement Confederation (IMEKO), the Israel Society for Quality (ISQ), the Israel Society for Analytical Chemistry (IASC) and the National Physical Laboratory of Israel (INPL) are the conference co-sponsors.

The Conference will be held in conjunction with the 16th International Conference of the Israel Society for Quality. Since the Society's biannual international conferences are very popular and generally attract 1500-2000 participants, both specialists in metrology (measurement, calibration and testing including chemical analysis) and quality professionals will have a unique opportunity to network with each other, interact with senior management and learn how to bring "the message" to as many people as possible.

In addition, a combined commercial exhibition within the framework of the two conferences on Metrology and Quality should be attractive for numerous participants and for producers of measuring instruments and quality products.

This 3rd International Conference is aimed at helping participants learn and develop new tools and techniques that will improve accuracy/quality of measurement, calibration and testing/analytical results. The Conference will therefore have a strong practical focus.

It is my pleasure and privilege to invite you to take part in the 3rd International Conference on Metrology in Israel, to be an active partner in a challenging and fruitful endeavor and to contribute to its success.

Joining us at the Conference will also enable you to enjoy exploring the Land of Israel, birthplace of the three great monotheistic religions.

We look forward to a peaceful 2006 and to welcoming you and your colleagues to Tel Aviv.

Dr. Ilya Kuselman, Conference Chair

Topics

- Trends in metrology
- Metrology as a business
- Measurement methods and their validation
- Measuring instruments and their qualification
- Measurement standards (etalons) and reference materials (RMs)
- Uncertainty estimation in measurement and testing/chemical analysis
- Traceability
- Inter-laboratory comparisons and proficiency testing (PT)
- Conformity assessment
- Accreditation of calibration and testing/analytical laboratories
- Accreditation of RM producers and PT providers
- Legal metrology
- Metrology in chemistry, petrochemistry, pharmaceuticals and environmental & clinical analysis
- Metrology for utilities
- Ethical problems in metrology
- Education

Abstracts of 500 words are invited on all the suggested topics. Abstracts must be submitted in WORD format by e-mail to <conf@isas.co.il> and a fax copy to +972-2-6520558. Final Submission Date: April 1, 2006

Registration Fee: The registration fee of \$395 for participants includes participation in all technical sessions, conference kit, program and proceedings, lunches and coffee breaks, welcoming reception and gala banquet and folklore evening.

Language: The conference will be conducted in English.

Exhibition: A commercial exhibition will take place within the framework of the conference. For further information please contact <meetings@isas.co.il>

Full-Day Tours:

Tour #1: Old and New City of Jerusalem

Tour #2: Nazareth, Tiberias, Capernaum

Tour #3: Caesarea, Haifa, Acre

Tour #4: Massada, Dead Sea

TEST & MEASUREMENT 2005 CONFERENCE

5 to 7 September 2005

Caesars Gauteng, Hotel and Conference Resort
Johannesburg, South Africa
(adjacent to the JHB International Airport)

Sponsored by:

National Laboratory Association

<<http://www.nla.org.za>>

We welcome everyone's participation.

A number of significant changes have been made to this years' format, and whilst retaining the essence of previous events, the organisers are confident that it will attract an even larger attendance than that seen over the past few years.

Once again please check the web site for further details.

INTERNATIONAL MEASUREMENT CONFEDERATION (IMEKO)

Chester Franklin, Liaison Delegate

XVII IMEKO World Congress

Metrology for a Sustainable Development

Sept 17-22, 2006

Rio de Janeiro - BRAZIL

Organized by the Brazilian Society of Metrology
Technical Support provided by NCSL-International
The official event of the International Measurement Confederation (IMEKO)

Information on: <<http://www.metrologia2006.org.br/>>

And <<http://www.imeko.org/>>

I am responsible for the organization of the XVIII IMEKO World Congress in 2006. To avoid overlap with other important events, the date was shifted from May 7-12, 2006 to Sept 17-22, 2006, which is the correct date now.

Submitted by Maurice Froto

INTERNATIONAL CONFERENCE ON METROLOGY

CAMET 2006

4 to 6 April 2006

Casablanca Morocco

Submitted by Charlie Motzko

Please visit this website for a downloadable Call for Papers and the programme.

<www.acmetrology.com>.

Communication Manager in charge of events:

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ENIM, BP 753 Rabat Agdal MAROC

Tél. : + 212 37 68 02 30 Fax : + 212 37 77 10 55

E-mail : <jm2006@enim.ac.ma>

Deadlines:

Conference : 4 - 6 April 2006

Submission of abstract : September 30th 2005

Notification of acceptance : October 30th 2005

Submission of full paper : December 30th 2005

Programme : February 15th 2006

Conference : April 4th to 6th 2006

LIAISON NEWS

INSTRUMENT SOCIETY OF AMERICA (ISA INTERNATIONAL)

Mike Suraci, Liaison Delegate

The ISA once again published our 2005 NCSLI Workshop & Symposium meeting notice at no cost.

Contacts have been initiated at ISA Headquarters to support the Education efforts headed by Georgia Harris. Additional effort is underway.

INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE I&M)

Dave Braudaway, Liaison Delegate

On March 13, a workshop on Uncertainty was held in Niagara Falls, Ontario, Canada. This workshop is the Advanced Methods for Uncertainty Estimation in Measurement or AMUEM. I presented the Keynote, "From the Absolute to Uncertainty." In the paper I trace the changes from 1948, the change from the International Units to the "Absolute" Units, to the present and the many changes now underway. The resistance value changed in 1948 by 495 parts per million.

The following week, the 2005 IMTC was held in Ottawa, Ontario, Canada.

JOINT LOGISTICS COMMAND (JLC/CCG)

Arman Hovakemian, Liaison Delegate

CCG Chemical Biological Subgroup Meeting

A meeting of the Chemical/Biological subgroup of the CCG was held commencing at 1645 on 15 November, 2004, in the Pimlico Room at the Marriot Hunt Valley Inn in Hunt Valley, Maryland. The meeting was held in conjunction with the 2004 Scientific Conference on Chemical And Biological Defense Research and was chaired by Mike Bishop. The following personnel were in attendance:

Dave Rohde	NSWC, Corona
Marie Juliano	NSWC, Corona
Anthony Woods	AFMETCAL/MLSR
Dave Madden	AFMETCAL/MLSR
James Haluska	COMOPTEFOR
Harold Banks	ECBC
Frank MacDonald	NSWC, Corona
Leigh Woods	USATA/AMCOM
Shen Zhu	US Army/TMDE
Paul Moser	AFMETCAL/MLEM
Mike Bishop	NSWC, Corona
Bill Ashman	ECBC
Burt Sutherland	USMC/CB

Mike Bishop opened with a discussion of the roles and tasks of the Chem/Bio Subgroup. Mike presented a high-level brief outlining the JLC org chart with all CCG subgroups. Dave Rohde then presented an overview of the new Chem/Bio Subgroup that would fall under the umbrella of the Interservice Support Group (ISG). There was much discussion about the JLC and the JPEO for Chem/Bio and how this group could benefit and influence the calibration/metrology requirements for Chem/Bio systems within the four services. There was further discussion on maintenance concepts, contractor logistics support, and organic capability with regard to what type of support is required to maintain the systems.

Paul Moser, US Air Force, gave a brief on an ongoing project the Air Force has with Oak Ridge National Laboratory (ORNL) to calibrate hydrazine detectors. Hydrazine is a rocket fuel, and is a major fuel component for the Titan family of Expendable Launch Vehicles (ELV), primarily used for putting satellites into orbit. Hydrazine detectors are used to check for leaks in storage vessels. Several years ago, it was reported to the CCG subgroup that the Navy did not use hydrazine detectors. Mike Bishop took an action to find out if this has changed; if the Navy is using these detectors, we could piggyback on this effort to develop cal support for them.

Shen Zhu from the Army gave a brief on the Air Force Particle Counter Standard Project and the FTMW project currently at NIST. The Army has received no new progress reports from NIST for either the PATS or the FTMW projects since the Army has not provided funding since FY 04. However, the Army has made a little progress internally in developing traceable calibration procedures for the PATS project. NIST is developing a standard procedure to calibrate a condensation particle counter (CPC) in PATS utilizing an electrometer.

The Army is developing a traceable calibration process of the electrometer in the subfemtoampere range to primary standards or NIST standards. The subfemtoamp measurement corresponds to a concentration of several tens of particles counted by the CPC. The next step of this research will investigate the calibration of the CPC by using the calibrated electrometer.

Since the meeting, the Army received and forwarded this word from NIST: "We have tried some things to eliminate multi charging, most of which have not worked. However, we have discovered an aerosol generator that produces with less than 2% dimers and no observed trimers. We have had a few technical difficulties and a loss of a key person working on the project. We are not finished, but I see a way to accomplish the metrology.

Mike Bishop gave an updated brief on the Standard Simulants project being conducted jointly with the Navy and the Army's Edgewood Chemical and Biological Center (ECBC). NSWC Corona is working on reports covering aerosol and vapor measurement and detection methods, while ECBC is compiling information on simulant and agent chemical and physical properties, and on CWA detector technologies, with an emphasis on Ion Mobility Spectroscopy. Bill Ashman from ECBC gave a brief on their report status. ECBC is at a point where they need input from NSWC Corona for guidance in structuring the final report.

Next, Mike Bishop discussed a Standard Simulants Phase II project in collaboration with Navy, Edgewood, and NIST. In the second phase, work is planned to conduct surety testing on a selected simulant for IMS systems. ECBC will conduct the surety testing, while NIST's involvement will be to ensure that what is done will ultimately result in a traceable simulant standard. Frank MacDonald gave an update on metrology/ calibration requirements on the Joint Biological Point Detection System currently headed up by the Army at ECBC in Maryland.

At the conclusion of the briefs, a tentative date was set for the next meeting, in the April/May timeframe. Location TBD.

AMERICAN SOCIETY FOR QUALITY (ASQ)

Chris Grachanen, Liaison Delegate

Certified Calibration Technician (CCT) Program

ASQ headquarters, in a show of flexibility and responsiveness to requests made by future CCT alumni, extended the April 2005 application deadline for its June 2005 CCT exam offering. This unusual extension was granted to accommodate CCT exam applicants who requested more time in order to get their application paperwork processed through their company's continuing education departments. As of this writing (late May 2005), there are a total of 223 applicants for the June 2005 CCT exam offering, a new record! Previous single record for total number of CCT exam applicants was 139. The following are CCT program statistics:

Date of Exam	Sat for Exam	Passed Exam	% Passed
7-Jun-03	97	69	71%
6-Dec-03	107	69	65%
23-May-04	4	4	100%
5-Jun-04	133	102	77%
4-Dec-04	139	104	75%

Good luck to those taking the June 2005 CCT exam; but, of course, luck has little to do with passing it.

Metrology Job Description (MJD) Initiative

In mid-March 2005 Craig Gulka, NCSL International's Business manager, sent a broadcast E-mail to NCSL International constituents soliciting job descriptions for Calibration Technician, Calibration Engineer and Metrologist. The same was sent by ASQ headquarters to Measurement Quality Division (MQD) constituents. The E-mails requested that job descriptions be sent electronically to Pat Muenzen of Professional Examination Service (PES) who is administrating the MJD Initiative on behalf of NCSL International and ASQ's MQD.

Near end of April 2005, PES communicated that they had surpassed the minimum requirement of 25 examples for each job description. They requested additional time (till the end of May) to continue compiling job descriptions as they were still receiving a steady stream of E-mails and wanted to have a good sampling from all over the U.S.

It is anticipated that by mid-June 2005, PES will submit their completed report to the MJD Initiative core team. This report will be used in developing a pilot questionnaire survey. An open survey will be conducted later this year to solicit input on what Metrology/Calibration practitioners believe should be included in the aforementioned job descriptions. Keep tuned for the latest on this important Metrology initiative.

ASIA PACIFIC LABORATORY ACCREDITATION COOPERATION (APLAC)

Peter Unger, Liaison Delegate

APLAC held an ISO 17011 workshop, MRA Council meeting, and Board of Management meeting in Japan during April 2005.

INTERNATIONAL MEASUREMENT CONFEDERATION (IMEKO)

Chester Franklin, Liaison Delegate

Here are some of the upcoming events/symposia organized by IMEKO committees:

August 01-06; *12th International Conference on Composites (Nano) Engineering*, Tenerife, Canary Islands, SPAIN

August 30 - September 03 - *Asia-Pacific Symposium on Measurement of Mass and Force*, Jeju, REPUBLIC OF KOREA.

September 12- 15; *14th Symposium on New Technologies in Measurement and Instrumentation and 10th Workshop on ADC Modeling and Testing*, Gdynia/Jurata, POLAND, 2005.

September 21-24; *Symposium on Metrology and Measurement Applications in the Era of Internet Working* Ilmenau, GERMANY, 2005.

September 26-28; *19th Metrology Symposium, 2nd Mediterranean Conference on Metrology and Testing*, Opatija, CROATIA.

September 28 - October 01; *22nd Danubia-Adria Symposium on Experimental Methods in Solid Mechanics* Monticelli Terme (Parma), ITALY, 2005.

November 08-10; *15th International Symposium on Measurement and Control in Robotics*, Brussels, BELGIUM.

And of course, there is the big one! IMEKO XVIII, "*Metrology for a Sustainable Development*," which will be held May 7 - 12, 2006, in Rio de Janeiro, Brazil. See page 53 for more information.

INSTITUTE OF ENVIRONMENTAL SCIENCE & TECHNOLOGY (IEST)

Robert Mielke, Liaison Delegate

This year, IEST will offer the Journal of the IEST online. Members and subscribers will be able to access not only the 2005 Journal of the IEST, but also the technical papers from our 2000-2004 volumes and selected archived papers from previous issues. The new, online

2005 Journal of the IEST will be linked to major internet search engines, opening up a new, worldwide audience for your company promotions.

The Journal of the IEST is an official technical publication of the IEST. The Journal features peer-reviewed articles of the highest technical quality in the areas of design, test, and evaluation; product reliability; and contamination control. For over 45 years, the Journal has been the premier provider of technical information published in a quality format for professionals in the environmental sciences.

More information about the Journal of the IEST can be found at <http://www.iest.org/journal/journal.htm> .

COUNCIL FOR OPTICAL RADIATION MEASUREMENTS

Sally Bruce, Liaison Delegate

CORM 2005 along the Colorado Front Range

In May, CORM 2005 was held at the NIST laboratories in Boulder Colorado. This three-day conference included tours of the National Renewable Energy Laboratories in nearby Golden, Colorado. Tour stops included the Outdoor Test Facility (OTF) for photovoltaic testing, and the NREL Solar Radiation Research Laboratory (SRRL). This year's reception and Grum memorial lecture were held at the National Center for Atmospheric Research. By all accounts the conference was a success. The keynote address was on NIST's role in the U.S. Measurement System and the conference theme was Radiometry and Photometry: Identifying and Overcoming the Challenges Facing Industry in the Measurement of Optical Radiation.

Plans are already made for CORM 2006 that will be held at NIST's headquarters in Gaithersburg, MD.

CORM 8th Survey in full swing

Since 1972, CORM has conducted seven independent surveys of the optical radiation measurement community to identify pressing needs for upgrading standards and services provided by NIST. The 8th in the series of such surveys is now available. Your input will be analyzed by the CORM 8th report committee to provide a prioritized summary of industry needs, (the CORM 8th Report), directly to NIST management and technical staff. NIST management views these inputs from its user community and CORM as extremely valuable.

NIST prepares an official response to each CORM report, detailing how identified needs are to be addressed.

Please take the time to respond with your survey input by JULY 31, 2005, by either

- Filling in the survey and two questionnaires on line, at www.corm.org, or
- Downloading the survey and questionnaires from www.corm.org, filling them in, and emailing the forms to: daryl_myers@nrel.gov with the word SURVEY in the SUBJECT field.

Fall 2005 CORM Board Meeting moves south of the border

Location: Querétaro, México
Host: CENAM
Dates: 12-13 September 2005

This meeting has been scheduled to fall right after the "V Symposium; Optics in Industry." This symposium would provide an opportunity for your respective businesses to network with key players in Mexican industry. If you wish to know more on what opportunities are available (product demo, display booth, presenter, etc...) please:

- 1) Go to : <http://www.simet.gob.mx/optica/english/default.htm>
- 2) read the attached documents or
- 3) Contact Dr. Eric Rosas (Symposium organizer)(erosas@cenam.mx)

MEASUREMENT SCIENCE CONFERENCE

Miguel Cerezo, Liaison Delegate

The 2006 Measurement Science Conference will be held at the Disneyland conference center in Anaheim, CA., February 27 - March 3, 2006. This will mark the 36th anniversary of the conference and will also coincide with Disneyland's 50th anniversary festivities. It promises to be a fun and busy time at the resort, so we encourage you to register early and make accommodation arrangements as soon as possible. The latest information is available at www.msc-conf.com.

The 2006 technical program is beginning to take shape with multiple and diverse tracks being developed. These include:

- DoD/Base Realignment and Closure
- RF and Microwave
- State of Support for Professional Associations
- The Math Behind the Measurements
- Accreditation
- Laboratory Measurement
- Measurement Automation

Additional suggested program tracks as well as potential paper submissions and presenter inquiries are welcomed. Please contact Doug Sugg at douglas.sugg@navy.mil for additional information.

As is customary, the 2006 Measurement Science Conference will include NIST Seminars and Tutorial Workshops. Anyone interested in contributing toward their development is encouraged to contact Bob Fritzsche at robert.fritzsche@navy.mil.

2006 will be here soon so don't delay in making arrangements to attend next year's Measurement Science Conference. We look forward to seeing you there and encourage you to bring your family.

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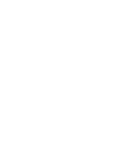
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(in conjunction with the NCSL International Workshop &
Symposium, August 6-10, 2006)

NEWSLETTER EDITORIAL SCHEDULE FOR 2005-06

Issue Date	In Mail	To Printer	Last Editorial to Editor
Oct. 05	10 Oct. 05	15 Sep. 05	1 Sep. 05
Jan 06	10 Jan. 06	15 Dec. 05	1 Dec. 05
Apr 06	10 Apr. 06	15 Mar. 06	1 Mar. 06
Jul. 06	10 Jul. 06	15 Jun. 06	1 Jun. 06

EDITOR'S NOTE:

This schedule is for guidance for anyone who needs to submit material for publication in the Newsletter.

FUTURE CONFERENCES

2005 NCSL International Workshop & Symposium
August 7-11, 2005
Washington, DC

2006 NCSL International Workshop & Symposium
August 6-10, 2006
Nashville, TN

2007 NCSL International Workshop & Symposium
July 29-August 2, 2007
St. Paul, MN

Abstracts are required for Workshops, Panels, and Papers. For more information contact:
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For the 2005 NCSLI Annual
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August 7-11, 2005

