President’s Message

John Ragsdale
NCSLI President

Come and Enjoy a Memorable Annual Conference

By the time you receive this copy of the NCSLI Newsletter, we will be only a couple of weeks away from our Annual Conference in Washington DC. And what a conference it is shaping up to be! In addition to the excellent technical sessions, we will celebrate the 40th Anniversary of NCSLI, and also observe the Centennial anniversary of the National Institute of Standards and Technology (NIST).

There will be many special recognition events during the conference including an NCSLI Alumni reunion. We also expect at least 22 past Presidents to attend the conference. Registration for this year’s conference is far ahead of any previous conference, and if you have not registered yet, I urge you to do so quickly. The conference hotel, the Washington Hilton and Towers, is filling up rapidly.

continued on page 22
TABLE OF CONTENTS

PLAN NOW TO ATTEND THE 40th ANNIVERSARY
ANNUAL CONFERENCE .................................. 3
NCSLI VISION, MISSION AND PURPOSE .................. 4
NCSLI POSITION PAPER-USE OF SI SYSTEM OF UNITS .... 5
METROLOGY CALENDAR ................................ 6
TRAINING INFORMATION ................................. 7
REMEMBERING HANK GONZALEZ ............................ 7
GLOBAL NEWS ........................................ 8
REPORTS FROM THE REGIONS ........................... 10
COMMITTEE NEWS ..................................... 23
SCENES FROM THE BOARD MEETING .................... 31
NCSLI NEWSNOTES ..................................... 32
NIST NEWS ............................................ 34
LIAISON NEWS ........................................ 40
WELCOME TO OUR NEW NCSLI MEMBERS .............. 44
NCSLI MANAGEMENT ROSTER ............................ 45

THERE'S JUST ENOUGH TIME FOR YOU TO DECIDE TO COME TO WASHINGTON
THE 2001 ANNUAL NCSLI CONFERENCE

HELP CELEBRATE OUR 40TH ANNIVERSARY
Washington Hilton and Towers
Washington, DC
July 29 – August 2, 2001

Theme: The New Economy: What Role will Metrology Play?

Contact: NCSLI Business Office, 303 440 339

EDITORS MESSAGE...

A Special 40th Year Commemorative Issue

I decided to treat this 40th Anniversary issue the same as you might remember from the 35th in 1996. The Newsletter is published in two sections. This regular July 2001 issue has the usual NCSLI operations reporting that you expect each quarter. The insert part is a special commemorative supplement which contains historical information and retrospectives which we hope will be of interest to all our Member Delegates, but, in particular, to our newest Members.

We have bound the main newsletter as well as the supplement separately, but they are also stapled together for mailing and distribution. If you wish to separate the two parts, you can do so by removing just one single key staple. This will allow you to circulate the 40th anniversary insert around to your Organization’s key management personnel, so they will be informed about the NCSLI organization and its beginnings in 1961.

Continued on page 5
The New Economy: What Role Will Metrology Play?

NCSL International 2001
Annual Workshop & Symposium

July 29 - August 2, 2001
Washington Hilton and Towers
Washington, DC

During the last decade of the 20th century there was a significant increase in the recognition of Metrology and the important role it plays in improving productivity, product quality, product defect reduction and, perhaps of greatest importance, its impact on global trade issues.

This increased recognition resulted in a significant shift in NCSL International's Membership from traditional areas to a more diverse base. Companies from the Chemical, Aerospace, Airline, Automotive, Healthcare, Optoelectronic, Testing Laboratory, Wireless Communication, as well as Food and Drug industries have recognized the impact of Metrology on their competitiveness.

Innovative Technologies:
The emergence of exciting new technologies, such as MEMS (Micro Electro Mechanical Systems), nanotechnology applications, and web-based interactive metrology interchange, will require new standards, measurement processes and measurement techniques. This necessitates new management tools to support their development and application.

In the new century, Conformity Assessment, which includes metrology, standards, and laboratory accreditation, will become even more important to the economic competitiveness of NCSL International's Membership.

Special Events:
The 2001 Workshop & Symposium will celebrate NCSL International's 40th Anniversary, as well as the 100th Anniversary of the US National Institute of Standards and Technology (NIST). There will be several events celebrating these milestones during the Conference. Tours of the NIST Laboratories at Gaithersburg, MD on Friday following the Conference will make this an especially memorable event.

Papers, Panels & Workshops:
The Workshop & Symposium offers papers, panels, and workshops that explore this year's Conference theme, and are organized into the following five categories:

- Theoretical
- Applied
- Management
- International
- Quality

Exhibitors: Meet with key executives and leading technical experts from over 150 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.

Tutorials:
In 2001, we are pleased to expand our Tutorials curriculum to include eight discrete specialty areas:

- Uncertainty, SPC and Risk Analysis Methods
- The Accreditation Process According to International Standards ISO 17025 1999
- An Introduction to 6-sigma
- Humidity and Dew Point Measurements
- An Introduction to Temperature Calibrations
- An Introduction to Mass Calibrations and Weighing
- An Introduction to Thread Gage Calibrations
- Equipment Interval Analysis & Adjustment: A Step-by-Step Approach to a Successful Process

Please plan to join us July 29 - August 2, 2001 in Washington, DC.

NCSL International
1800 30th Street, Suite 305B
Boulder, Colorado 80301-1026 USA
Voice: (303) 440-3339
Fax: (303) 440-3384
E-mail: <info@ncslinternational.org>
<www.ncslinternational.org>
NCSLI Vision

Promote competitiveness of NCSLI International Member Organizations by improving the quality of products and services through excellence in calibration and testing.

Mission and Purpose

NCSLI International (NCSLI) is a continuing, nonprofit corporation oriented toward organizations involved in Metrology and related activities.

The mission of NCSLI International is to advance technical and managerial excellence in the field of Metrology, Measurement Standards, Conformity Assessment, Instrument Calibration, as well as Test and Measurement, through voluntary activities aimed at improving product and service quality, productivity, and the competitiveness of Member Organizations in the international marketplace.

NCSLI International accomplishes its mission through activities whose purposes are to:

- Advance the state-of-the-art in all Metrology and related activities in both the technical and the management area.
- Provide liaison with technical societies, trade associations, educational institutions, and other organizations or activities that have common interests.
- Assess Metrology requirements and develop uniform, Recommended Practices related to the activities of the Membership.
- Provide a forum to accomplish the objectives of NCSLI International through Conferences, Regional / Sectional meetings, Committee activities, and publications.
- Serve as an effective channel to assist various international laboratories in dissemination of information to Metrological communities, and to collect and present information to strengthen and improve national measurement systems and the horizontal linkages between these systems.

NCSLI International...

...established in 1961, and now celebrating its 40th Anniversary, offers global Membership consisting of academic, scientific, industrial, commercial, as well as government organizations that have a common interest in Metrology and related Measurement Science activities.
THE NCSLI INTERNATIONAL POSITION STATEMENT ON USE OF THE SI SYSTEM OF UNITS
John Wehrmeyer, V.P. of Documentary Standards Applications

Prompted by the increased recognition that we are truly an international organization and due to our growing documentary standards writing activity, NCSLI International has decided to state in certain terms its position on the use of the International System (SI) of units. This latest position statement, published below, was approved by the NCSLI International Board of Directors as a means of declaring our support for the use of the SI units and as a guideline for our writing committees.

As an international organization, the Board is sensitive to the fact that our membership is multi-cultural and that our members are affected by a variety of legal requirements. Therefore it is not our intention to try to impose any rules or requirements on anyone by stating our position. On the other hand, where it is a matter of choice, and whenever the customers’ needs can be met, we encourage the use of the International System of Units.

NCSLI International Position on the Use of the International System of Units [SI]

It is the position of NCSLI International that the International System of Units [SI] as defined by the CIPM, International Committee of Weights and Measures [Comité International des Poids et Mesures]1 will be used in the publication of its technical documents such as documentary standards, Recommended Practices [RPs], and Recommended Intrinsic/Derived Standards Practices [RISPs].

Within the limitation of legal regulations, NCSLI International also encourages the use of SI system in everyday practices and communications.

Domestic national interpretations of the CIPM documents are recognized as acceptable for use in each respective country. As an example, in the United States of America, the acceptable interpretation is NIST Special Publication 811, 1995 Edition, by Barry N. Taylor entitled, Guide for the use of the International System of Units [SI] or its future editions.


EDITOR’S MESSAGE (continued from page 2)

Because NCSLI has so many new Member Organizations in the last 5 to 10 years, we felt that our 40th year supplement should look back all the way to the NCSLI roots. While many of you are familiar with those earliest years, this commemorative insert will serve to remind ourselves just how far we have come. We’ve expanded the narrative history information, and hope you enjoy the history lesson.

By the way, we printed up an extra supply of the inserts by themselves, for use at the Washington Conference and for later use if you want them for distribution around your company or technical group. Contact the Business Office if you need a few.

A Farewell to the Lowry Metrology School

For decades, the gateway to U.S. Air Force Metrology operations was the Lowry AFB Metrology School in Denver, CO. Indeed, some of you readers are Lowry Alumni, who moved to civilian metrology, after completing your service tours. The original USAF school had been transitioned to a DOD, tri-service school years ago.

Then, that Metrology school moved to Keesler AFB, near Biloxi, when Lowry was decommissioned in the early-90's.

A civilian training school, the Aurora Community College, took over some functions, with the most recent manager being Terrelle Wilson, who is active on our NCSLI Education committees. We now have word that their metrology program is closing. Yet, I'm sure that the Lowry name will remain in the hearts of those more senior readers, who spent a part of their lives there. I, too, had a small connection to Lowry; having taken my pre-induction physical there.

Changing our Name

By the way, you will also notice a subtle change on the cover masthead of this issue. We decided to get consistent with the change of our organization's name to NCSLI International, so the newsletter is now called NCSLI Newsletter.

John Minck
Editor, NCSLI Newsletter
METROLOGY CALENDAR

NCSL MEETINGS
July 29-August 2, 2001
NCSL Workshop & Symposium
Washington Hilton and Towers, Washington, DC
CONTACT: NCSL Business Office, (303) 440-3339
FAX: (303) 440-3384
e-mail: info@ncsliinternational.org
website: ncsliinternational.org/conference

10th Intl. Metrology Congress
October 22-25, 2001
Saint-Louis, France
Information: www.metrologie2001.com

INDUSTRY/GOVERNMENT MEETINGS
Natl. Conference on Weights & Measures, Annual Meeting
July 22-26, 2001
Washington, DC
Information: FAX: (301) 990-9771
On-line registration: www.ncwm.net

Measurement Science Conference
January 23-25, 2002
Anaheim, CA
CONTACT: John Bowman, (714) 847-7380
e-mail: john.bowman@fluke.com

5th Intl. Symposium Fluid Flow Measurement
April 7-10, 2002
Washington, DC
CONTACT: George Mattingly, (301) 975-5939
FAX: (301) 975-8288
e-mail: gmattingly@nist.gov

REGION MEETINGS

REGION 10
Japan
10TH ANNUAL MEETING
November 22, 2001
Tokyo Metropolitan Ohta-ku Industrial Plaza
in Ohta-ku, Tokyo
CONTACT: Kazumi Hayakawa, 3-3434-0181
FAX: 3-3434-0170
e-mail: kaz.hayakawa@fluke.com

REGION 12
Canadian Region Fall Meeting
September 27-28, 2001
National Research Council, Ottawa, ON
CONTACT: Jim Mullins, (613) 226-7920 x230
FAX: (613) 226-8195
e-mail: jmullins@pylonelectronics.com

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

Please send Metrology Calendar additions and corrections to the NCSL International Business Office,
(303) 440-3339 FAX:(303) 440-3384, or E-mail to <info@ncsliinternational.org>
TRAINING RESOURCES AT RIDGEPASS WATER CO (See additional information in the Training Directory)

Ridgewater College offers traditional and online courses from the measurements science program, which can lead to a Degree/Diploma in Metrology. Ridgewater utilizes, among other resources, WorkPlace Training’s Precision Measurement computer-based training modules in a portion of the curriculum. Since Aurora Community College in Colorado recently discontinued its Calibration Program, NCSLI Members may be looking for alternatives to that program.

In addition, Ridgewater may grant college credit for coursework already completed by new enrollees in its Distance Learning Program.

For more information contact Ridgewater College, Herb O’Neil at 800 222 4424, Ext 240, <herbo@ridgewater.mnsu.edu>, or WorkPlace Training, 800 472 2564, <www.wptraining.com>

REMEMBERING HANK GONZALEZ

Henry F. (Hank) Gonzalez
1934 - 1999

Henry F. Gonzalez was born Sept. 25, 1934 in New York, NY. Hank was stationed at White Sands Missile Range, Las Cruces, NM, when he was in the Army. Upon completion of his Army tour in 1960, and a brief period of employment with a base contractor, he began his civil service career in metrology and calibration at WSMR.

Old-time NCSLI members will remember Hank, who often attended our NCSLI Conferences with Jim Harmon, Chief of the Metrology Lab at White Sands. In spite of its physical remoteness, the WSMR Metrology Lab was well known for its high technical sophistication and calibration capacity. Because of the large number of missile and technical programs which were tested there, the calibration workload was both high-tech and large.

In the early days of computer-operated automatic test systems, Hank was involved in the design and implementation of their lab’s systems for instrument calibration, as well as for RF and microwave applications. He was a member of the early NCSLI Automatic Test Committee.

Some might remember Hank for his moment of unwanted fame in the 1970’s, occasioned by his Congressional testimony regarding a large U.S. Army contractual situation, and subsequently, being interviewed by the 60 Minutes TV program. Hank was always a bit reluctant to talk about that experience, although he did very well under that pressure. And we know of no other NCSLI Members who have such unique pictures and memories in their family albums.

Hank retired April 2, 1994, as Chief of The Secondary Standards Branch. He passed away on March 2, 1999, and is survived by his wife Dora, and son Jonathan.

An anecdote contributed by co-worker Robert Sleever: Hank grew up in the 1940’s and 50’s, in suburban northern New Jersey. In modern parlance this was “Soprano Country,” where there were profound linguistic and attitudinal (brusque) influences in the populace.

In the early sixties, Hank and one of his fellow calibration lab fledglings discovered that they had been raised in similar neighborhoods. They enjoyed an almost daily exchange of loud and brash insults, perfected in their youthful association with their neighborhood friends. While always in the spirit of fun and amusement to them, their colleagues undoubtedly remain puzzled to this day about the nature of that relationship.

Editor’s Note: Sorry for the late notice but we just discovered that Hank had passed in 1999.
Ed Nemeroff, V.P.
Former Republics of the Soviet Union

During this 1st quarter, I spent 3.5 weeks in the Central Asian Region (just north of China, west of Siberia) of the Confederation of Independent States (C.I.S.) of the former Soviet Union. This was a USAID program to support the metrology, accreditation and standards activities in the region (5 Nations), Kyrgyzstan, Kazakhstan, Turkmenistan, Uzbekistan and Tajikistan.

Based in Bishkek, the capital of Kyrgyzstan, I worked directly with their NMI, Kyrgyzstandart. My task was to assist them in writing a concept plan for the development of an infrastructure for their National Metrology, Accreditation, Certification and Standards Organization. This was being done for compliance to the WTO - TBT agreement. Kyrgyzstan is the only member of the total CIS (14 nations including Russia) to be a member of the WTO.

It was a great experience; I had the opportunity to promote NCSL International and expect to shortly have another NMI become an active member of NCSLI. I was able to present an NCSLI watch to the Director of Kyrgyzstandart.

Ed Presents an NCSLI watch to Batyrbek Davlesov, Director Kyrgyz Republic, The State Inspection for Standardization and Metrology - Kyrgyzstandart.

Banquet with official members of Kyrgyzstandart and US Government. We had a complete lamb feast. As guest of honor, I was given the head of the lamb as my main course.

Ed was presented with a ceremonial coat and hat; He’s now an official Cossack.

Metrocal 2001 - Concepcion Chile, April 25-27

NCSL International was a sponsor of Metrocal 2001, held in Concepcion, Chile. Over 160 individuals attended from 21 countries. I had been previously elected to their international scientific organizing committee. I attended the conference and made three presentations including a showing of the NCSLI video.

We used the new NCSLI portable tabletop display for the first time.
Luis Fernandez Canobra, President of Chilnet, and Ed Nemeroff of NCSLI meet at the booth.

CHILMET, the Association of Chilean Metrology, is an organization similar to NCSLI. It is an organization of organizations and currently has over 50 private sector member companies. Work has already started to have our two organizations establish formal liaison.

SIM – The InterAmerican Metrology

SIM is planning to hold their annual General Assembly meeting and workshop in Miami, Florida, September 16-21. Contact me or Roosevelt DaCosta for information.

********

NCSLI STRENGTHS COOPERATION WITH THE BRAZILIAN SOCIETY OF METROLOGY (SBM)

Dr. Mauricio N. Frota
NCSLI Coordinator, Brazil
SBM President

The success of METROLOGIA-2000, held in the city of São Paulo, Brazil, last December (4-7), is a clear evidence of another fruitful partnership established between NCSLI and the Brazilian Society of Metrology. SBM serves as the Regional Coordination of NCSLI in South America, bringing together over 1500 professionals and about 50 organizations involved in Metrology in Brazil. During the official ceremony hosted by the Governor of São Paulo and by the Minister for Science and Technology of Brazil, the Brazilian Society of Metrology signed a Memorandum of Understanding with NCSLI International and with the Australian Society of Metrology.

METROLOGIA-2000 reflected current themes and advances in metrology and its impact on health, environment, in the quality of life and in the development of competitiveness. It was organized in the context of important celebrations related to the 500th anniversary of the discovery of Brazil. It also marked the centennial of the Max Planck Quantum Theory, announced in 1900, allowing one century later - the genesis of today’s technology, based upon the fundamental constants of physics.

This was the theme under which METROLOGIA-2000 took place.

“Promoting Metrology in the Light of Great Discoveries”

METROLOGIA-2000 was a strategic event attended by over 2000 professionals from the Brazilian and international business community, together with academics, renowned specialists, researchers and metrologists from 22 countries linked to important international metrological organizations.

The General International Congress was organized as a merging of six associated events in different areas of Metrology (chemical, electrical, optical, legal, laboratory quality and telecommunication), which produced about 2000 pages of Proceedings including 228 technical papers (also available in CD-ROM). Metrologia-2000 also encompassed seven Modules:

- Metro-Expo-2000, an international Exhibition of laboratories, manufacturers and distributors of measuring instruments;
- Metro-Business, understood as an unique key-forum fostering business and promoting intelligent networking, it was a fascinating and strategic environment which induced real time business among those visionary entrepreneurs participating in the conference and exhibition;
- Metro-Education & Training Module, under which about 30 specialized training courses in Metrology in advanced topics were offered by internationally recognized instructors;
- Metro-Excel, a Metrology Award launched by the Brazilian Society of Metrology with the support of the industry, to reward significant contributions to the development of Metrology;
- Metro-Journal, a technical journal entitled Metrology and Instrumentation, focused on the metrology needs of the industry, already circulating in its fifth issue and;
- Metro-Venue, an environment created to host strategic official technical meetings of international metrology committees, such as technical committees of the Inter-American Metrology System (SIM), International Committee for the Amount of Substance (CCQM/CIPM), Technical Groups of IMEKO, among many other national and regional meetings.

The Brazilian Society of Metrology (SBM) strongly supports NCSLI activities, serving as its regional coordination for South America, to further its mission of promoting the culture and practice of Metrology, as tools for improving competitiveness and the quality of life, encouraging the adoption of modern practices and international tendencies, bringing people and institutions together and instigating the interchange of national and international specialists and experiences. SBM has recently been appointed by the Council of the International Measurement Confederation (IMEKO) to host the 2006 World Congress in Brazil, creating new opportunities for cooperation and the integration of metrology worldwide.
Region 3, Maryland Section, held a meeting on Friday May 4, 2001. The meeting was hosted by NIST at the Gaithersburg, MD facility. Kevin Abercrombie opened the meeting and introduced Marlin Johnson, past Region 3 Coordinator, and Bill Simmons, Past NCSLI President. Bill presented Marlin with a plaque from the NCSLI to recognize Marlin's many years of service to the NCSLI.

Kevin then introduced Ramona Saar, Maryland Section Coordinator and this year’s Conference Director. Ramona reviewed the upcoming Workshop and Symposium and the proper use of the NCSLI logo.

Mr. Robert Moore, Deputy Director, NIST Facilities and Safety, gave the first presentation. Mr. Moore presented an interesting discussion about the new Advanced Measurements Laboratory (AML) being constructed at NIST. The AML is the most advanced measurement laboratory in the world. It is a $200M project that is expected to take four years to complete. Information about the AML can be found on the NIST web site at <http://www.nist.gov>. The site also includes a live web cam of the construction site.

After a short break, Ms. Roxanne Robinson, from A2LA, presented a talk on the Accreditation process. Ms. Robinson discussed several aspects of the accreditation process including proficiency testing, uncertainty statements and the difference between accreditation, certification and registration.

After lunch, Allen Todd, Fluke Corporation, presented a paper on Fluke’s experiences with accreditation.

Finally, the group held an open discussion as to what steps can be taken to improve attendance at the local meetings. Patuxent River has agreed to host the next meeting which is tentatively scheduled for October 2001.

On behalf of Ramona and myself I would like to thank all of the attendees and presenters.

Attendees:
Dana Launten
Brian Tenzer
Ned Sain
Marlin Johnson
Bill Simmons
Ike Fanning
Karen Staley
Thomas Jansen
Sally Brice
Roxanne Robinson
Ramona Saar
Allen Todd
Chuck Austin
Steve Wieden
Larry Parsons
Carroll Hickok
Kevin Abercrombie
Robert Moore

A2LA
Wendler
Northrop-Grumman
JHU APL
Wyle Labs
Tektronix
Smith Industries
NIST
NIST
A2LA
A2LA
Fluke
NAWCAD
NAWCAD
Raytheon
NIST
NAWCAD
NIST
After touring the exhibit area and sampling the breakfast buffet, our meeting was kicked off by Jack Shuler, our Region 4 Coordinator. He introduced the Atlanta planning committee, and our host, Dr. Gloria Purcell, of the Center for Quality Excellence at Southern Polytechnic University. Dr. Purcell provided an overview of the many undergraduate and graduate programs offered including a 100%-online Master in Quality Assurance program. The CQE is also involved in continuing education programs such as "six sigma," and various ISO courses.

Dr. Jim Salsbury, Corporate Metrologist, Mitutoyo America Corp., provided an overview of his company and provided an introduction to the concepts of measurement uncertainty through a presentation entitled "What time is it?" After a review of the concepts, Dr. Salsbury provided a worked example of "Micrometer Calibration" based upon ISO/TR 14253-2:1999 and Dr. Nielsen's methods.

Kevin Kaufman of Tegam discussed vendor changes in the precision resistor marketplace with "Today's Sources for Standard Resistors." Where did the product lines end up; are they a main focus of the companies, and who to contact, were all covered in detail.

Randy Fowler of Fluke presented "Multiple Tones in Power Calibration" which explained the problems of power quality caused by harmonic distortion in the voltage and current waveforms. The problem was referenced to something we as consumers understand - the cost of electrical power!

After a hot lunch made possible by our exhibitors, and the obligatory pictures [now digital], Karl Haynes from Electro Rent Corp presented a workshop on temperature uncertainty. The audience participated in developing two measurement-uncertainty equations.

Randy Fowler returned with his second presentation of the day, an electrical uncertainty workshop. He presented an overview of the measurement-uncertainty process and vocabulary of the metrology measurement-uncertainty process.

Dennis Fuller, our new NCSLI section coordinator, recognized the speakers and hosted our door prize drawings. The exhibitors were DST Technical Services/TEQ Spec, Fluke, ASR, Tegam, and Southern Marketing Associates.

The Atlanta Planning Committee consists of: Doug Severance, Randy Fowler, Jay Romanek, Jack Shuler, Karl Haynes, Dennis Fuller, Dennis McGillemsey, and Wes Harris. Photography credit to Wes Harris.
The first speaker was Roxanne Robinson, Vice President of A2LA. Her presentation, “Benefits of Accreditation,” offered information on concepts, global perspectives, benefits, processes, proficiency testing, and preparation techniques for on-site assessment.

The second speaker was Dr. Carroll Brickenkamp, NVLAP program manager. Her presentation provided NIST’s perspective on laboratory accreditation. The presentation covered topics such as: requirements for a reliable measurement laboratory, the importance of using an accredited laboratory, the value of obtaining accreditation, how to tell if a laboratory is accredited, and how to obtain accreditation. The presentation also covered national and international accreditation organizations such as NACLA and ILAC.

After a break for lunch, the section held a panel discussion on laboratory accreditation, with representatives from accredited laboratories fielding questions from the audience.

Jeff Gust, Vice President of the Northeast Division of NCSL International, provided a presentation on recent activities of the Board of Directors, ANSI/NCSL Z540-1-1994, ISO 17025, and ISO 10012. The meeting concluded with a raffle for door prizes that were provided by NCSL International.

Thanks again to Roxanne Robinson and Carroll Brickenkamp and their respective employers A2LA and NIST for supporting NCSL International by providing presentations on this important subject. Thanks also to PTS Calibrations for hosting the meeting location, and providing coffee, doughnuts, and bagels for the meeting.

Attendees:
David W. Thompson
Veagh McCary
Carroll Brickenkamp
Glenn Rousser
Nelson Ambrodez
Mark Stevens
James Randin
Jerry Veerkamp
Dareni Vechum
Larry Kerr
Dave Kerr
Ken White
Michael Richmon
Ros Stember
Doug Englinthorn
Dan Oron
Bill Roberts
Dick Chambers
Jim McWilliams
Lou Skothe
Chuck Crawford
Jim Reilly
Mike Truax
Jeff Gust
L.H. Cabrito
Eiverse Appliance Controls
NIST/NVLAP
Raytheon
ITT
Rolls Royce Corp.
Rolls Royce Corp.
Rolls Royce Corp.
Quality Control Sales and Service
Quality Control Sales and Service
Raytheon
Raytheon
Raytheon
Rolls Royce Corp.
Indiana Standards Lab
PTS Calibrations
Dreser Industries
Vader Sylvania
Michiana Calibration
Measurement Instruments
Verizon Logistics

REGION 6

April 15, 2001
Agilent Technologies
Richardson, TX
Allen Todd
Central Texas Section Coordinator

Region 6 Central Section held a meeting April 15th 2001, hosted by Agilent Technologies at their facility in Richardson, TX. Of 180 invitations sent out, 57 responded and there were a total of 31 attendees.

Allen Todd opened the meeting, giving an overview of the agenda and welcoming Agilent Technologies back as a host of local NCSLI meetings. Max Marin from Agilent Technologies was introduced and gave everyone a brief update on Agilent Technologies and their new facility.

A member introduction was conducted, followed by a presentation by Roxanne Robinson, Vice President of A2LA on “The Benefits of Accreditation” followed by a brief Q&A.

After a short break Dr. Carroll Brickenkamp, spoke on “NIST’s Perspective on Accreditation.”

After lunch provided by Agilent Technologies, Steve Griffin of Fluke Electronics Corporation spoke about the “Fluke Accreditation Story” giving background and insight into the 18-month accreditation process their Standards Lab went through to achieve NVLAP and DKD accreditation.

Wayne Cummings, of Fluke Electronics Corporation, then gave a talk on “Automated Batch Temperature Calibration.”

A drawing was held for a total of 18 door prizes provided by Fluke, Agilent and NCSLI.

Attendees:
Keith McNeiluck GE Industrial Systems
Theresa McCoy Superior Gauge
Dan Costneres Mentor Corporation
Dick Gristman Mentor Corporation
Laron Sapps LNR Calibrations
Scott Rasmussen Bell Helicopter
John Dobbs Bell Helicopter
Dave Sandlin Celestec Services
Jim Dohse Technology Rentals and Services
Lory Fletcher Technology Rentals and Services
Brian Aylay Technology Rentals and Services
Chuck Atkinson Technology Rentals and Services
Mark Hemmeline ST Microelectronics
Dave Marsak ST Microelectronics
Chad Oliver Honeywell
Brian Meisner GE Industrial Services
Vincent Smart Visa Credit
Ina Cucio Bell Technologic
Chaaash Levey TXU/CCS
Brian Jones Acadata
Phil Ficenover Acadata
D. Keith Scaggs STMicro
Brian Cullen Motorola
Katherine Brown Motorola
Gregg Shuman Verizon Electronic Repair
Rick Hock Calibration Specialty
Walt Hill Southwest Research
Jim Patterson Consulting Services
Fred Mixon Agilent Technologies
Mike Duffie Agilent Technologies
Max Maxia Agilent Technologies
Todd Morally Acadata
Michael Linek Metroner Metrology
Susan Craig Metroner Metrology
Jim Johnson Metropex Metrology
Lori Ann Dunton GE Industrial Systems
Dave Upton EMA Instruments
David Varneyo Tristate Laboratory
March 24, 2001
Compaq Computer Center
Houston, TX
D. Keith Scoggins
South Texas Section Coordinator

The NCSLI Region 6 South Section winter meeting was held on February 1, 2001 at the Compaq Computer Center in Houston, Texas. The meeting was hosted by Dave Stumway from Compaq Computer Corporation and was conducted by Keith Scoggins, the South Section Coordinator and supervisor of the metrology laboratory at the South Texas Project Nuclear Operating Company.

Opening comments were made by Keith Scoggins to welcome everyone to the meeting and to also request feedback on the types of presentations attendees would like to see in future section meetings.

The first presentation of the morning was delivered by Chris Grachan, from Compaq Computer Corporation. Chris spoke about ASQ Measurement Quality Division's Certified Calibration Technician Program. He confirmed the necessity for certified metrology technicians and described several different methods to realize certification.

The second speaker was Don Rodriguez, from Thermal Polystonics Incorporation. Don’s presentation was on the fundamentals of liquid flow measurements and how ultrasonic flow devices can be utilized to provide accurate flow measurements.

Next, Greg Second, from DH Instruments Corporation, gave a presentation on a “Turn-Key Laminar Flow Element Calibration System for Low Mass-Flow Instruments.” He discussed the need for an evolution in standards and certification methodology to improve the process measurement and control of low-mass flow.

After Greg’s presentation, Dave Sanders, from Oscilloscope Services, talked about a new customer service that his company is offering on the Internet. It looks like the Web is where we are all headed: if we cannot provide calibration services and information to our customers on the Web, someone else will.

Before lunch, Keith Scoggins gave a presentation about why the NCSL changed their name to NCSL International.

Lunch was provided by our host, Compaq Computer Corporation.

The next speaker, Ken Kolb, from Ruska Corporation, provided the group with interesting information about how NIST had supplied Ruska with reduced uncertainty estimates for the assigned effective areas for Ruska’s primary deadweight gauges. Ken detailed how these improved uncertainties could be transferred through the calibration chain and realized by their customers.

The last speaker of the day was Matthew Sell, from On-Time Support. Matthew gave an overview of developments in process calibration traceability. He explained how currently available software, used with the Fluke Documenting Calibrator, could provide reverse traceability for field calibrations.

The meeting concluded with a general discussion on the desire to start two laboratory inter-comparison measurement programs, one for a 10-volt electronic cell and another for a pressure device. Wayne Cummings, from the Fluke Corporation, will coordinate the 10-volt electronic cell and Ken Kolb, from Ruska will coordinate the pressure device.

A tour of the Compaq Computer Corporation facilities was provided to attendees wishing to see that operation.
The Spring meeting of NCSLI Region 9 was held at the Battelle Pacific Northwest National Laboratory (PNNL) on May 11, 2001 at Richland, Washington.

Ken Harrison, of PNNL, our host, welcomed us to the Environmental Molecular Science Laboratory (EMSL).

Dave Agy, of Fluke, presented NCSLI news. Highlights included the certified technician program and the future of NCSLI publications (possibly a method for sharing publications internally for member organizations).

Del Knapp, of Tektronix, discussed the path of ANSI/NCSL Z540-1, in light of the newly adopted ANSI/ISO/IEC 17025. He noted that ANSI/NCSL Z540 has been reaffirmed with a 5-year extension, and that the Writing Committee would rewrite Z540 within 2 years and would address 17025 deficiencies in the new Z540 document.

Barry Sachs presented the calibration management program at PNNL. A method for charging outside calibration services, using an online visa card (unique support beyond the local cal lab) to two approved vendors, seemed an excellent solution for ensuring controlled resources among a vast array of lab requirements. One of the benefits of such a system is the elimination of organizational “red tape” and virtually eliminating the administrative costs usually associated with procuring outside services. The card allows for up to $2500 per use. Barry also covered their system of online procedures and the fact that the official copy of documents is the online (not the paper) version.

Bob Carmichael, of Bechtel B&W Idaho, presented insight into the consolidation of calibration services at the Idaho National Engineering and Environmental Laboratory.

Dave Agy stepped through the evolved requirements for uncertainty in ISO 17025. The difference in European and American conventions resulted in accounting for uncertainty without specific constraints on guardbanding. Fluke has proposed a solution for guardbanding at 80% of performance specifications for Test Uncertainty Ratios between 1.5:1 and 4:1, which would greatly simply uncertainty analysis.

Rick Laboy, of Boeing, Puget Sound Metrology, introduced his group’s method for Coordinate Measuring Machine (CMM) calibrations, including a unique method transferring standard uncertainties between CMM machines. The attendees enjoyed each presentation, and, as coordinator, I found myself eventually having to cut off the questions.

After lunch, we toured the EMSL. The four-year old facility allows scientists to share amazing resources in a very aesthetic setting. Separated into two groups, we toured through four different labs. It was awe-inspiring to be in laboratories where exotic research into atoms and molecules was so elegantly presented.
Among the highlights included:

1. A massively parallel supercomputer built by IBM capable of 250 gigaflops (250 Billion floating point operations per second).
2. A Nuclear Magnetic Resonance Facility capable of analyzing biological tissues at the molecular level.
3. A lab which can build substrates on semiconductor materials molecule by molecule.
4. Other labs which can look at crystals and other materials at the molecular or atomic level.

We then visited the more down-to-earth calibration lab at Hanford. With approximately 15 technicians, the lab performs approximately 15,000 calibrations/year on radiation monitoring equipment and approximately 1400 calibrations/year on ordinary measurement and test equipment. Michele Johnson, the calibration manager, fields many questions from the attendees. The lab has had to develop a system for keeping up with requirements for remote labs.

Delivery trucks are provisioned like vendors and respond as required. The lab has also had to deal with a permanent requirement for paper records of calibrations and a parallel system for electronic archiving. We also received an overview of various kinds of radiation sources (alpha, beta, and neutron) used for calibrating monitoring equipment, including shielding and special transport systems in use.

We had a full day and an excellent visit to Richland. Thank you Ken.

After their lab tour, and in the sunlight, it’s hard to tell if this group is actually going to glow in the dark tonight?
Speaker: Andre Hampton - Lockheed Martin
Topic: Welcome to Lockheed Martin

Andre Hampton, Director of Engineering Services, stated in his introduction and welcome to Lockheed Martin that metrology was very important to the engineering and manufacturing success of the company, and metrologists had very strong interactions with the quality function. A video of Lockheed Martin state-of-the-art technologies and new product developments was shown, including the development of the 2001 Mars Odyssey spacecraft.

Speaker: Carol Hockert - NCSLI Central VP
Topic: NCSLI Updates

The Board of Directors meeting was held in Cincinnati in early May. One of the critical issues facing the organization is declining membership. A committee has been established to develop action plans and recommendations to recruit new members and re-enlist current members. Any ideas from Section members are welcome. A copy of ISO/IEC 17025 has been sent to member delegates to help in the deployment of this new international standard for testing and calibration laboratories. All Recommended Practices (RPs) are now available on CD-ROM.

Mike Crittenden - Transmation
Topic: Documenting Calibrators Using PDAs

Documenting calibrators are being used as working standards for many types of field calibrations, most of which are very comprehensive. Some operational concerns are the installation of the software and procedures, and pre-populating the calibrators. Transmation uses the power of the Personal Digital Assistant, such as the Palm Pilot III, to improve productivity. The PDA can work independently of the calibrator, and can be used for personal applications. The calibrator uses the touch screen of the PDA to configure and control the connected calibrator.

Several calibrator models are available, and a multi-function calibrator will be on the market soon. The QuickDoc™ Recording Software turns any model calibrator into a fully-functioning documenting calibrator capable of storing calibration data, easily synchronizing data to desktop applications for storage and printing, maintaining calibration schedules, storing procedures, sorting and transposing data, and storing data sheets.

Speaker: Doug Evinik - Phalen Kimball
Topic: Twin Cities Section Pressure Round Robin

The goals of the recent pressure round robin were to provide minimal requirements to the participants, to ensure that any Twin Cities member could participate, to provide a method for sharing best practices, to ensure that any level of uncertainty could participate, and to refine the process for the next series of round robins.

Ten companies participated the Level 2 round robin as described in RP-15. The artifact was an Ashcroft liquid-filled pressure gage with a +/- 1% accuracy. Several types of calibration methods were employed, including dead weight testers and pressure modules from several different manufacturers. Lessons learned included that this was a real life example of a pressure calibration, that only two sets of readings fell totally within the gage specification limits, and that five out of the ten companies stated the uncertainty as a percent of reading. Additionally, uncertainty budgets had a wide variance and almost all decrement readings were lower than increment readings.

Future pressure round robins should include a more stable and accurate artifact, more details and instructions on conducting the round robin, and a better mechanism for reporting errors.

Speaker: Mike Searle - DH Instruments
Topic: Improved Pressure Calibration Results

The topics of Mike's presentation included pressure measurement terminology, improving pressure calibrations, automation in pressure calibrations, and discussion and questions. Mike reviewed different, and sometimes confusing, differential, absolute and gage pressure terminology by examples and graphical representation. Hardware selection, calibration procedures, environmental conditions, operator, data collection and reduction factors all have an impact on pressure calibrations.

Mike stated that it is fortunate for pressure calibrations that there are two independent primary pressure technologies; liquid manometers and piston gages. His guidance concerning specifications is that instruments, including primary standards, are ALWAYS incorrect, and it is up to the metrologist to predict just how incorrect the measurements are. Considerations include sensitivity, resolution, linearity, hysteresis, temperature effects, acceleration (orientation) effects, pressure distortion effects (non-linear), precision, repeatability, reproducibility, and stability.

Pressure generation and control, media separators and secondary measurements are crucial support-hardware elements to control. Cardinal point, nominal point and crossfloat calibration techniques were reviewed, and several considerations for corrections were presented. Examples of operator errors include lack of formal training, mass accounting, and transcription errors. The three levels of automation of pressure calibrations are the reference instrument, test execution, and data management levels.

Speaker: Rick Brion - Martin Calibration
Topic: Featured Lab

Martin Calibration was accredited to ISO/IEC 17025 in December 2000, which was driven by QS9000 and the automotive industries. Rick's focus has been on customer service, with listening to the customer, corrective actions, customer response, and customer surveys. The company has been reorganized to better provide ongoing services to their customers.

Speaker: Rick Brion - Martin Instrument
Topic: Twin Cities Ring Gage Round Robin

Five companies participated in the recent ring gage round robin sponsored by the Twin Cities Section, with four different devices used in the comparisons. Lessons learned from the round robin include that the standard itself was out of specification, pressure and anvil deformation, and anvil wear were important factors. Recommendations for future ring gage round robins include a better artifact, larger ring diameters to assess temperature effects, wider range of rings (.5 to 6 inches), more participants, and a volunteer for the pivot lab. Rick compared these results to the Pratt & Whitney B-89 ring gage committee of 2000. He reviewed the revised ANSI/ASME B89.1.6M - 1984 standard. Recommendations for measurement improvement included sweeping through the ring to find the widest diameter, and tilting to find the narrowest diameter.
Reports from the Regions

Speaker: Chuck Rheault - Lockheed Martin
Topic: Twin Cities Resistance Round Robin

Six companies participated in the resistance round robin. Because of the artifact and the number of participants, this round robin was easy to facilitate. All participants were within their stated measurement uncertainty. The results were graphically presented, and have been shared with the participating laboratories. The recommendations are to schedule another resistance round robin in three to five years, and concentrate on another parameter, such as voltage.

Speaker: Rod Erke - Lockheed Martin
Topic: Resistance Calibrations

Rod reported on the improvements made in Lockheed Martin's resistance measurement capabilities. The electromagnetic laboratory has recently acquired an automated resistance bridge from Measurements International. He presented supporting documentation and graphs showing the improved stability and accuracy of the measurement system. In addition to greatly improving repeatability, the measurement uncertainty was improved from 0.45 ppm to 0.14 ppm.

Topic: Twin Cities Round Robins

With this meeting, the results of all the recent Twin Cities round robins have been reviewed. Open discussion, recommendations, and feedback included:

1. Sharing of calibration procedures between participants. However, some considered calibration procedures company confidential.
2. Results of all lessons learned should be summarized and shared with the Section. Terry Conder to facilitate.
3. The question is; did we accomplish the original objectives of the round robins?
4. For future round robins, a better definition and documentation of objectives are required.
5. During the round robin, if a problem arises, the pivot lab should intervene, instead of waiting until the end of the cycle.
6. Consider posting the results electronically.
7. Organize a planning meeting by discipline and round robin participants before the next cycle to define the details.
8. Continue to keep the environment safe for sharing lessons learned.
9. NAPT (National Association for Proficiency Testing) has made a proposal to NCSLI to use their expertise and capabilities to facilitate any future NCSLI-sponsored round robins.
10. Participants should review uncertainty budgets ahead of time.
11. Must emphasize keeping the artifacts moving through the round robin to ensure timely completion.
12. An overwhelming consensus to continue with sponsoring round robins.

Attendees:
Tom David
Mike McDonald
Chuck Rheault
Karl Stogner
Terry Conder
Sandra Lumin
Rori Nelson
Jay Killien
Don Howard
Cindy Reardon
Jim Manches
Don Murawski
Kevin Kinsie
Greg Urbach
Dave Mueller
Mike Settle
Bob Gruns
Roger Zemanits
Doug Erickson
David Lang
Mike Hulstine
Lerry Rothen
Brady Rubenchuk
Steve Boyles
James Reinz Sr
Craig Storker
Jim Yost
Rod Erke
Bill Moser
Chuck Rheault
Rick Brown
Tim Ensminger
Doug Burch
Dave Ludwig
Craig Mjosen
Jeanne Morgan
Yam Nigo
Bruce Adams
Carol Hecker
Mark Zaradny
Gaylord DeGroot
Scott Gingerich
Kevin Johnston
Bob Remer
Jim Groomman
Chuck Ellis
Dave Guzmen
National Calibration
Watson Nelson
Craig Hubbard
Mary Anderson
Doug Evick
Randy Foth
Philip Sykes
Doug Walton
Jon Kauffer
Jane McDougall
David Gale
Lisa Gale
Mark Hodges
Mark Tobin
Tom Clark
Heck O'Neill
Scott Salads
Ed Weyterspoon
Karla Konig
Dan Novak
Scott Reddy
Shawn Mason
Walt Kendal
Ivan Shepard
Terry Steweche
Kevin Yostler
Mike Cridenran
Tony Mahale
Cindy Jensen
Lanny Newman
Gary Neigel
Pat Kendal
Jim Delcaze
Paul Hansen
DHI Instruments
Dyte Instruments
Dyte Instruments
General Dynamics
General Dynamics
Guidant
Guidant
Guidant
Honeywell SCP/MSRF
Hutchinson Technology Inc
Hutchinson Technology Inc
Lockheed Martin
Lockheed Martin
Lockheed Martin
Lockheed Martin
Lockheed Martin
Metodonic
Metodonic
Metodonic
Metodonic
Minnesota Dept of Public Services
Minnesota Dept of Public Services
Minnesota Dept of Public Services
MTS
MTS
MTS
NAPT
National Calibration
Northwest Airlines
Palm Kriball
Palm Kriball
Palm Kriball
Palm Kriball
Palm Kriball
Polarlab
Precision Repair & Calibration
QCTIS
QCTIS
QCTIS
QCTIS
QCTIS
Ridgewater College
Ridgewater College
Ridgewater College
Ridgewater College
Ridgewater College
Ridgewater College
Ridgewater College
Shack&l Inc
Sims Deflec
Sims Deflec
St. Jude Medical
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
Trans Company
True Hardware
True Hardware
TSSI
TSSI
United Standards
Workplace Training

REGION 11
April 11, 2001
Northrop Grumman DSD
Rolling Meadows, Illinois
Tom Waltrich
Chicago Section Coordinator

Forty people were in attendance at the April 11, 2001, Chicago Section meeting. The theme of the meeting was laboratory automation. Our host, Steven Struckman and Northrop Grumman provided excellent facilities, refreshments and lunch.

Tom Waltrich opened the meeting with introductions and a presentation of the agenda. A reminder was made to contact any of the committee members with feedback on current activities, future meeting topics or other suggestions.
The members of the NCSLI Chicago Section Steering Committee are:

Mike Alhed - Instrument Calibration Service
Ralph Bertennan - Lighthouse Training Group
Chris Evelo - Dytec/Midwest
Ken Kern - Siemens Medical Systems
Dave Walters - Abbott Laboratories
Tom Waltrich - Baxter Healthcare

Mr. Steve Struckman, of Northrop Grumman, then welcomed everyone to the facility and provided logistics.

The first speaker of the day was Mr. David Katzer with Siemens Building Technologies, Inc. Dave gave a presentation entitled, "Electronic Records and Signatures in an FDA-Regulated Metrology Environment." The talk focused on the Food and Drug Administration (FDA) ruling 21 CFR Part 11, which addresses data integrity and accountability of electronic records and signatures. Dave provided a comprehensive overview of the ruling along with guidance for compliance.

Our second speaker of the day was Mr. Gary Jennings of the Northrop Grumman Corporation. Gary gave a presentation titled, "Metrology Automation in a High Technology Environment." Gary spoke about the necessity of automation to cope with increasing workloads and decreasing headcount budgets. He provided an overview of the process needed to automate calibration procedures/processes as well as providing recommendations for implementation. He stressed that you should build on your automation successes, start small and use the success achieved in order to justify larger projects.

The third speaker was Mr. Bill Wightman with the Fluke Corporation. Bill discussed automated batch thermocouple calibrations using a new Fluke system. He presented the systems features, capabilities, measurement considerations and sources of error.

Our final speaker of the day was Mr. Steve Struckman of the Northrop Grumman Corporation. Steve provided us with highlights of the Northrop Grumman Metrology program.

Due to the courtesy of the Northrop Grumman Corporation and the Siemens Building Technologies and Medical divisions there were many door prizes raffled off. Certificates of attendance were also provided to attendees.

The day was ended on a high note with a tour of the Northrop Grumman Metrology laboratory.

I would like to thank everyone who attended the meeting for their interest and participation. Thanks to the speakers for their time and fine presentations.

The fall Chicago Section Meeting will be held on October 11, 2001 at the S&C Electric Company in Chicago Illinois.

Getting the real lowdown during the Lab Tour.

All those bright cheery faces, and seemingly not a single set of closed eyes.
Twenty two people were in attendance at the May 23rd, 2001, Region 11, Madison Section meeting held at Promega Corporation in Madison, Wisconsin. Promega furnished excellent facilities and the cost was minimal for lunch and snacks.

Jay Bucher welcomed everyone, and opened the meeting, the first for this section, by having all the attendees give their name, company and what they do. There was a large variety of companies and experience on hand.

**Presentation:** *When Your Company Needs A Metrology Program, But Can Not Afford To Build A Calibration Laboratory...What Can You Do?*

**Speaker:** Jay Bucher from Promega Corporation

Jay’s presentation (he presented this paper at last year’s NCSL International Workshop & Symposium in Toronto, and included a copy of the paper for each attendee) covered the following topics:

- Review of a quality system
- How Promega started their metrology program
- Personnel requirements
- Calibration procedures
- Traceability and uncertainty
- Miscellaneous labels used with test equipment at Promega
- Calibration management software and its importance
- Scheduling your calibrations
- Some lessons learned.

**Presentation:** *Training a Calibration Technician...In a Metrology Department?*

**Speaker:** Corinne Pinchard from Promega Corporation

Cori’s presentation covered the various topics that are presented during the training of new calibration technicians at Promega. They included:

- Accuracy vs. precision
- Traceability, the paper trail, and uncertainty
- Quality systems to include calibration procedures and records
- What is done when equipment is found to be out of tolerance
- Hands on training, and also lessons learned.

**Presentation:** *The Care and Feeding of 2000 Pipettes?*

**Speaker:** Keela Sniadach from Promega Corporation

Keela presented Promega’s pipette program from nuts to bolts. She included:

- Options of calibrating in-house, bringing in a vendor, and sending all pipettes out for regular calibration
- How Promega’s program is set-up
- How Promega’s Pipette Calibration System works
- She took us through the journey of inspection, calibrating and labelling pipettes at Promega.

**Attendees:**
- Abaro Laboratories
- Bese Eight, Keithley
- Covance
- Divarte, Jeff
- Fryer Co., Inc
- G&L Industrial Systems
- Gentry
- Gevac
- J.H. Metrology Co., Inc
- K&M Metrology Co., Inc
- PaceView Corporation
- Process Control Solutions
- Promega Corporation
- Promega Corporation
- Promega Corporation
- Promega Corporation
- Promega Corporation
- Scientific Promotion Lab
- Scientific Promotion Lab
- State Cal Lab
- Third Wave Technologies
The Spring meeting of the Kansas City Section was held on April 17, 2001. Russ Mathox, of Honeywell AEL, in Olathe, KS, hosted the meeting at his facility and provided refreshments. Thirty-one people were in attendance at the meeting.

The morning started with a get-acquainted time and refreshments. Roger Burton, of Honeywell FM&T, brought the meeting to order with welcoming remarks, introductions and a review of the day’s agenda.

Jerry Ford of Honeywell FM&T gave a presentation on Multifunction Calibrator Certification. The normal procedure for calibrating digital multimeters (DMMs) and multifunction calibrators is to periodically adjust them to nominal values at a few points and then rely on the manufacturer’s specifications at all points for some time interval. This makes sense for instruments used in a manual mode, but those under computer control may be better left unadjusted so that a stability and drift history can be established and used to improve performance. Jerry described calibration and correction techniques that achieve uncertainties considerably smaller than the instrument’s specifications.

Wayne Cummings of Fluke provided a very informative presentation on Batch Temperature Measurement.

Ron Russell of Honeywell FM&T gave a presentation on Development of a Vacuum Calibration System. The Vacuum Gage Metrology System (VGMS) was developed to support stringent vacuum measurement demands for process characterization and control at Honeywell FM&T. The presentation addressed the methodology and design of VGMS.

The calibration methodology of the VGMS was generation of a stable pressure to be used as a transfer mechanism during calibration of Vacuum Gages by comparison to known standards. The known standards used within the system are:

- MKS Spinning Rotor Gage (SRG)
- 1 Torr MKS Baratron Capacitance Manometer
- 10 Torr MKS Baratron Capacitance Manometer
- 1000 Torr MKS Baratron Capacitance Manometer
- Pressure Divider
- Temperature Bath and controller

The calibration is started when thermal stability is attained and the test gas is defined, connected, and purged. The calibration pressure is generated using one of three different techniques. The selection of a specific technique is driven by the magnitude of the calibration pressure that must be achieved.

- Static Technique 0.01 to 1000 Torr
- Dynamic Technique 1 5.0 x 10^-4 to 0.01 Torr
- Dynamic Technique 2 5.0x10^-8 to 1.0x10^-4 Torr

* Utilizes the orifice rating methodology

The system is automated and as a pressure is generated and the measurement is completed the system creates the next calibration pressure point and the process is continued until all the calibration data has been taken.

Leon Barnes of Honeywell FM&T concluded the presentations with an overview of the ANSI/NCSLI Writing Group Activities.

Each attendee was asked to fill out a meeting questionnaire, and the completed questionnaires were drawn to award door prizes. A special thanks to Fluke and the NCSLI business office for supplying some nice door prizes.

The day concluded with an excellent tour of the Honeywell AEL facility.
Canada Spring Meeting

Our April 2001 Spring meeting, held at Environment Canada’s National Water Research Institute located at the Canada Center for Inland Waters, in Burlington, Ontario, was very successful and well attended by 46 people. Special thanks to our host, Les Peer, and the Water Research Institute for once again providing this beautiful facility for our meeting.

Water quality measurements are made at this institute in support of the Canada/USA Great Lakes Water Quality Agreement and various scientific studies. Information from these studies is used in identifying areas of concern involving significantly high water-pollution levels. Resulting data is used to formulate Remedial Action Plans (RAP) involving local users and all levels of government in order to address these concerns.

On behalf of our NCSLI Canadian Region, I would like to thank the following speakers who gave excellent presentations:

Mark Kuisma, Quality Engineering Test Establishment – Safety Mobile Phones

Dr. Jennifer Decker, NRC – Fundamentals of Gauge Block Calibration.
Reports from the Regions

Marilyn Ross, an NCSLI contributor for years (and probably decades), and the heart of Region 12, is recognized at her retirement by Region 12 Coordinator Wayne Sampson.

Wayne took the easy way out on their group shot, by not herding the people outside for the usual on-the-steps format.

PRESIDENT’S MESSAGE (continued from cover)

Prior to the April Board of Directors meeting, Charlie Motzko and I met with Dr. Janusz Lustyk, Director General of the National Research Council of Canada (NRCC), and other senior members of his staff in Ottawa, Ontario. We discussed the recently published Canadian National Measurements Requirements Report, the rapid growth in the areas of biotechnology, chemical metrology, and accreditation issues related to free trade.

Graham Cameron, NCSLI Past President, was also able to join us and report on the state of metrology education activities in Canada. He participated with us in a discussion on the need to increase our emphasis in the creation of formal metrology education programs, both in Canada and the United States. This was a very productive meeting and we are indebted to Gary Hysert, NRCC Representative to the Board, for arranging for the meeting.

At our Spring Board of Directors meeting in Cincinnati, OH, the Board of Directors voted unanimously to publish NCSL International Position Paper #3, “NCSL International Position on the Use of the International System of Units (SI).” The text of this position paper is on page 5 in this Newsletter. In other news of note, Dr. Richard Kayser informed the Board that NIST has developed a policy on traceability (see page 32). This policy can be viewed on the NIST website:

<http://www.nist.gov/traceability/nist>. NIST is soliciting feedback from the metrology community and comments can be sent to NIST at <traceability@nist.gov>.

Our next Board of Directors meeting will be held in conjunction with the annual conference in Washington, DC. One of the highlights of this meeting each year is the Region/Section Coordinators Workshop. This event affords the Region/Section Coordinators, and members of the Board, an opportunity to discuss ways to better support Region and Section activities, to increase membership, and to develop strategies for improving attendance at Region/Section meetings.

This year, the Region/Section Coordinators workshop will be held from 3-5 PM on Sunday afternoon. Carol Hockert, VP of the Central Division, along with support from the other Divisional VPs, will conduct the workshop. Topics that will be discussed include membership recruitment initiatives and the Uncertainty Analysis Workshops. These will be presented in a number of cities around the United States in October, 2001, and in April, 2002. In fact Seattle, Salt Lake City and Chicago have already been scheduled for this October. Please check with your Region/Section Coordinator or the NCSLI website for the exact dates.

In closing, I would like to extend my thanks and appreciation to John Minck, who has been NCSLI Newsletter Editor for 23 years. John is a remarkable and tireless volunteer who continually produces a quarterly newsletter we can all be proud of. This Anniversary Issue is due in the most part to his dedication, enthusiasm, and tireless efforts in conducting the research and coordinating the input of the other authors that contributed to this special edition.

John Ragsdale
NCSLI President

At the Canada management meeting (L-R): Graham Cameron, Dr. Eddy So, Gary Hysert, Dr. James McLaren, Dr. Janusz Lustyk, Charles Motzko, John Ragsdale, and Dr. Chander Grover.
STANDARDS POLICY
Anthony Anderson, V.P.

NATIONAL COOPERATION FOR LABORATORY ACCREDITATION (NACLA)

I attended the NACLA Board of Directors meeting in San Francisco in February. The main item on the agenda was to review a draft document on a proposed Memorandum of Understanding (MOU) between the Standards Council of Canada, (SCC) and NACLA. The idea of an MOU between SCC and NACLA for acceptance of each other’s National Accreditation Systems had come about after the failure to reach agreement on a North American Laboratory Accreditation Cooperation. With Mexico dropping out of such a proposed cooperation, Canada still expressed a willingness to come to some arrangement with the US regarding mutual recognition of each other’s accrediting bodies.

At the NACLA annual meeting and Workshop held at the beginning of April in Washington DC, the SCC-NACLA MOU was signed by Peter Clark, Executive Director of the SCC and Don Heiman, President of NACLA. This MOU now means that laboratories accredited by NACLA-recognized accrediting bodies in the US will be recognized in Canada, and laboratories accredited by SCC in Canada will be mutually recognized in the US.

The issue of a North American Laboratory Accreditation Cooperation, which was originally hoped would come about as phase two of the NACLA idea, is no closer as a result of the SCC-NACLA MOU. The popular approach at the moment is for Canada and the US to link up with the developing regional Inter-America Laboratory Accreditation Cooperation (IAC) rather than have a separate North American region. I attended a lively NACLA International Affairs Committee meeting on this issue during the AGM and I will report further at the Cincinnati Board meeting.

John Gilmour, a Past Chairman of the International Laboratory Accreditation Cooperation (ILAC) gave the Keynote address at the NACLA meeting. During his address he made reference to the current North American focus on the Americas, but reminded NACLA that it should also look westward. He was referring to the US participation in the Asia Pacific Laboratory Accreditation Cooperation (APLAC). He went on to say that there would be concern internationally and in ILAC particularly if US interest in APLAC should wane. He further reminded the meeting, that thanks to Dr. Belinda Collins’s recent chairmanship of ILAC, the US had played a major role in ILAC over recent years. He urged the US and NACLA to continue this strong participation.

Mr. Gilmour reported that he was currently in the US, together with Helen Liddy, on a mission to persuade panels of resistance to buy into the NACLA idea and accreditation in general. It has been recognized that the recently signed international Multi Lateral Arrangements (MLA’s), such as the ILAC MLA, have not necessarily addressed US regulators’ concerns. However they are pointing out in their meetings that of all the conformity assessment processes, accreditation is the only one that satisfies the WTO TBT (Technical Barriers to Trade) agreement in that it is transparent, non-discriminatory and fulfills all the attributes of the agreement.

I am pleased to report that Steve Stahley, an NCSCI board member, was honored at the NACLA AGM with a distinguished service award. He received the award for his role in bringing about the automotive industry’s acceptance of NACLA-recognized accrediting bodies for fulfilling QS9000 requirements of its suppliers’ products and services.

INTERNATIONAL LABORATORY ACCREDITATION COOPERATION (ILAC) LABORATORY ACCREDITATION LIAISON COMMITTEE (LLC)

I attended the ILAC LLC meeting in Brussels at the end of March. The Chair of the LLC, Mr. David Stanger, gave a report on the recent ILAC Executive meeting in Berlin. He summarized the main thrust of the meeting in a statement from ILAC Chairman, Mr. Mike Peet. Mr. Peet said that ILAC must continue to implement the MLA, pursue discussions regarding a possible future merger with the International Accreditation Forum (IAF) [but without detriment to the separate activities of either IAF or ILAC], and to provide support to assist developing countries to join the ILAC community. Further, the ILAC Executive also wished to strengthen links with the laboratories and other ILAC stakeholders and to add value by playing a role in inter-governmental transactions.

It was reported during the LLC meeting that the development of ISO CASCO 17011 has been postponed due to difficulties between the participants, particularly with reference to inspection. There is already to be a revision of the new ISO/IEC 17025:1999 standard to harmonize section 4.2 of the standard, Quality System, with the new ISO/IEC 9000:2000 Quality Standard. One suggestion is to replace section 4.2 completely with the requirement to meet ISO/IEC 9000:2000.

Regarding the ILAC MLA, the LLC has a watching brief in the implementation of the arrangement. This is a valuable opportunity for laboratory stakeholders to be a party to the implementation of the ILAC MLA. Dr. Maic Walsh (EURACHEM) is the LLC observer assigned to the ILAC Arrangement Committee responsible for its implementation. The committee, from the laboratory perspective, discussed several aspects of the implementation of the MLA. Currently the view of the LLC is that the MLA does not have wide-spread support among laboratories in the US and Europe. It was felt that transatlantic arrangements were not working particularly well because there was still no universal acceptance of ISO/IEC 17025:1999 as a common benchmark.

The subject of proficiency testing was discussed as referred to in ISO/IEC 17025:1999, and required by accrediting bodies. Concern was expressed as to the potential conflicts of interest between accrediting bodies and proficiency testing service providers. The considerable burden of expense that proficiency testing is likely to impose on laboratories was a further concern expressed by the committee.
Committee News

The committee discussed the LLC status within an incorporated ILAC. Its role should be changed to strengthen the voice of the laboratory community in the political area. It was agreed that the committee’s views would be relayed to the ILAC Executive who should keep this issue in mind during the forthcoming debate on incorporation. The Committee resolved that the status and role of the LLC should be clearly specified in an incorporated ILAC. It was the expressed view of the committee at its last meeting that the present name does not reflect that the LLC is of equal status to others within ILAC. After discussion it was resolved: that the name of the Laboratory Liaison Committee be changed to the Laboratory Committee at the time of incorporation of ILAC.

The next meeting of the ILAC LLC will be on Tuesday, October 30, 2001, in Kyoto, Japan during the 2001 ILAC General Assembly meeting.

Committee Activities:

U.S. GOVERNMENT AFFAIRS

Mike Suraci

****************

MEASUREMENT SCIENCE AND TECHNOLOGY

Richard B. Pettit, V.P.

Activities:

- Completed selection of abstracts for 2001 NCSLI Workshop and Symposium Technical Program. Arranged talks into sessions, sent letters to speakers; organized papers (82 from sessions, plus 19 Reserve) for publication in Proceedings; negotiated “Reserve Paper” status with authors with lost e-mail abstract submissions; and participated in teleconference call.
- Continued discussions on possible ways for NCSL International to expand its support of proficiency testing with NCSLI Measurement Comparison Programs Committee Chair, Jim Wheeler, and Robert Watters, NIST.

AUTOMATIC TEST & CALIBRATION SYSTEMS

Scott Sowerby

Scott Sowerby, Verizon, has agreed to become the Chair of the Automatic Test and Calibration Systems Committee. Scott organized a teleconference that was aimed at continuing to organize the Committee and identifying action items for the committee to pursue. The Committee will have another teleconference before holding a meeting at the 2001 NCSLI Conference in Washington, DC.

MEASUREMENT COMPARISON PROGRAM

Jim Wheeler

Al Teruel

NCSLI is reviewing how best to help members with ILCs (Interlaboratory Comparisons). We need ILC coordinators to step up to the plate to lead ILCs in measurement areas to help labs gain accreditation. Come to the committee meeting at the NCSLI Annual Conference, so we can discuss your interests.

The committee meeting is Tuesday, July 31st, 2001, at 4:15pm in the Jefferson East Room of the Hilton Hotel. Al Teruel, <Teruel@navair.navy.mil>, MCP Committee Co-Chairman, will chair the meeting. Al is a Mechanical Engineer in the Metrology Engineering competency at the Navy Primary Standards Laboratory, and is also the proficiency manager for the Joint Naval Audit Certification Team.

Dr. Dick Pettit (Sandia National Laboratories) and I are continuing to work with Dr. Bob Waters, NIST, on a U.S. National Comparisons Database. A paper was presented at MSC 2001 in Anaheim titled, "U.S. National Comparisons Database to Support Traceability." Dr. Waters helped to develop the International ILC Database that can be seen at: <http://icdb.nist.gov>.

To paraphrase Bob’s abstract: “In order to link data that support traceability within the U.S. to the ICDB, NIST is working with NCSL International and others to develop a U.S. National Comparisons Database (NCDB). Such linkages involve measurements, calibrations, measurement comparisons, and proficiency tests that involve a hierarchy of standards and standards laboratories, ultimately linked with those used in international comparisons.” I would like to organize a working group of 3 or 4 past NCSLI MCP coordinators to help develop criteria to evaluate information and data for this new Internet database. Please attend the MCP Committee meeting at NCSLI or e-mail me if you are interested.

Larry Nielsen <lenielsen@home.com> and the NCSLI Accreditation Resources Committee completed a draft RP on Accreditation. In the section on proficiency testing, there is a discussion on the differences between MAPs, Interlaboratory Comparisons and proficiency testing. Contact Larry for a copy of the draft.

The next Josephson-Junction ILC will begin in January 2002. Fluke will provide the Zener artifacts. It was suggested at NCSLI Toronto that in addition to having Canada and Mexico participate, other NMIs in the Americas, like Brazil and Argentina, would be invited to participate, if willing and able. Dave Deaver (Fluke) agreed to provide help with customs issues in countries where Fluke has representation. Other topics discussed were: goals of next ILC, procedures to be used, and job assignments. The New J1 Team will be Dave Deaver, Clark Hamilton, Stu Kupferman, Bill Miller and Barry Wood. Thanks to Klaus Jaeger for providing this information.

Something new this quarter is the following table showing MCP activities. It will be easier to read, and recognize activities that you may want to participate in. Recent past efforts will also be listed. This is in response to a member’s request that we provide this table format.
<table>
<thead>
<tr>
<th>Measurement Discipline</th>
<th>Range</th>
<th>Point of Contact</th>
<th>Phone No.</th>
<th>E-mail Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass</td>
<td>1 Kg</td>
<td>Jim Ross (Quality Control Services)</td>
<td>(503) 236-2712</td>
<td><a href="mailto:Lab@qc-services.com">Lab@qc-services.com</a></td>
</tr>
<tr>
<td>Dimensional (Steel and Chromium Carbide)</td>
<td>0.25, 0.5, 0.75, 1.0, 2.0 and 4.0 inches</td>
<td>Brian Foltz (Rockford Calibration Service)</td>
<td>(815) 877-0880</td>
<td><a href="mailto:brian@thecalibrationsolution.com">brian@thecalibrationsolution.com</a></td>
</tr>
<tr>
<td>Helium Leak</td>
<td></td>
<td>Pat Abbott (NIST)</td>
<td>(301) 975-0838</td>
<td><a href="mailto:patrick.abbott@nist.gov">patrick.abbott@nist.gov</a></td>
</tr>
<tr>
<td>Vector Automatic Network Analyzers (VANA)</td>
<td>Supports 2.4 mm, 2.92 mm, 3.5 mm, GPC-7, 7-16, Type N Connector Types</td>
<td>John Cable (Honeywell FM&amp;T)</td>
<td>(816) 993-3661</td>
<td><a href="mailto:jcable@kc.com">jcable@kc.com</a></td>
</tr>
<tr>
<td>Southern California and Arizona regional ILC group: Dimensional, Electrical RF, Mass/Force, Temperature, Electrical LF, Flow, Mechanical, Time/Freq, Humidity, Pressure/VAC and Pipettes</td>
<td>Various</td>
<td>Louis Reimer (ICC Instrument Company)</td>
<td>(714) 540-4966, Ext 400</td>
<td><a href="mailto:louisr@iccinstrument.com">louisr@iccinstrument.com</a></td>
</tr>
<tr>
<td>U.S. National Comparisons Database</td>
<td>Various</td>
<td>Bob Watters (NIST)</td>
<td>(301) 975-4122</td>
<td><a href="mailto:robert.watters@nist.gov">robert.watters@nist.gov</a></td>
</tr>
<tr>
<td>(Josephson Junction) DC Voltage (Start in 2002)</td>
<td>10 VDC</td>
<td>Dave Deaver (Fluke)</td>
<td>(425) 356-5400</td>
<td><a href="mailto:deaver@fluke.com">deaver@fluke.com</a></td>
</tr>
<tr>
<td>Ultra Violet (Proposed)</td>
<td></td>
<td>Tom Larson (NIST)</td>
<td>(301) 975-2334</td>
<td><a href="mailto:thomas.larson@nist.gov">thomas.larson@nist.gov</a></td>
</tr>
<tr>
<td>Resistance (Proposed)</td>
<td>1 Ohm</td>
<td>Jeff Gust (Verizon)</td>
<td>(219) 428-6504</td>
<td><a href="mailto:jeff.gust@verizon.com">jeff.gust@verizon.com</a></td>
</tr>
<tr>
<td>Vibration (Proposed)</td>
<td></td>
<td>Brian Conroy (Litton Guidance and Control)</td>
<td>(818) 715-2594</td>
<td><a href="mailto:conroyb@littoncs.com">conroyb@littoncs.com</a></td>
</tr>
</tbody>
</table>

The NCSLI Mass ILC is underway. Jim Ross (Quality Control Services) <Lab@qc-services.com> (503) 236-2712, would like to hear from you if you are interested in participating in the Mass ILC. Two 1-kg artifacts will be used in the ILC. Quality Control Resources will do the analysis. Abbott Labs just finished measuring the artifacts and sent them on to the Army, at Redstone Arsenal. So far 8 labs have completed measurements of 12 participating, with possibly two more, if they get their labs and standards ready. NCSLI is in the process of requesting formal NIST participation. Jim reports that Quality Control Services is the pivot lab for the WRAP 100-6 to 1-mg round robin. Jim plans on comparing the results of this new NCSLI Mass ILC with that of the NIST Mass Group after the NCSLI ILC is completed.

Pat Abbott (NIST) <patrick.abbott@nist.gov> is interested in a Helium Leak Inter-comparison. Pat reports that one or more Helium Permeation leaks would be the comparison artifacts. NIST would be the pivot lab and the ILC would be limited to 10 participants. Pat indicates that the "star pattern" would be the best way to go as the artifact(s) are fragile, and NIST would want to know ASAP if there is a problem. Pat wants to limit the time frame to about one year.

Louis Reimer, ICC Instrument Company, <louisr@iccinstrument.com> (714) 540-4966, ext 400, is coordinating the efforts of a southern California and Arizona regional ILC group. Louis reports that "On October 27th, at the NCSLI regional meeting held at Verizon (GTE), we discussed and solicited for interested parties to participate in a local Round Robin Program. The series of ILCs will address secondary as well as working standard artifacts on a quick turnaround basis.

To avoid using dairy chain distribution and to streamline the process, most of the participants are choosing level one and two.

Level One: Public: All aspects of the ILC including associating participants with final results.

Level Two: Confidential: Participants are public, data results are not. We currently have 13 companies within the southern CA and one in Arizona that will be involved. Of the 13 companies we have 6 coordinators that will compile data for specific disciplines.

We are in need of 5 additional coordinators for the following: Dimensional, Electrical RF, Temperature, Mechanical and Time/Frequency. Disciplines included are: Mass/Force, Electrical LF, Flow, Humidity, Pressure/Vacuum and Pipettes. The number of interest for each discipline is: Dimensional 6, Electrical RF 2, Mass/Force 4, Temperature 4, Electrical LF 6, Flow 3, Mechanical 2, Time/Frequency 3, Humidity 4, Pressure/VAC 5, Pipettes 2 and Other 2.

Brian Foltz <brian@thecalibrationsolution.com> (815) 877-0880, is the technical manager at Rockford Calibration Service. He is planning a gage block ILC. Brian reports that the blocks are ready to go to NIST after a delay problem. The sizes of the blocks are 0.25, 0.50, 0.75, 1.00, 2.00, and 4.00 inches. The results will be reported to all who participate, with level 2 confidentiality per RP-15, all labs given a code to identify their results. After completion of the study, the blocks will be returned to NIST for re-certification. The ILC will be limited to 15-20 participants, to complete the study in no more than 8-9 months. Assisting Brian with the data analysis is Gordon Skatun, Regional NCSLI Director. A second set of chromium carbide blocks is also part of the ILC, thanks to Starrett.

Brian Conroy, Litton Guidance and Control, is interested in starting a round robin in Vibration. Brian’s email address is <conroyb@littoncs.com>. His phone number is 818-886-6872.

Fred S. King <fkings@keellabs.com>, QA Manager at Kimball Electronic Laboratory Inc., is interested in participating in future ILCs in measuring Gage Blocks, and DC resistance.
An impromptu meeting was held at Measurement Science Conference with Roxanne Robinson, Jeff Gust, Dick Pettit, Chuck Ellis and Larry Nielsen. We discussed accreditation issues relating to ILCs. One suggested priority for ILC Coordinators was the need for conformity to ISO Guide 43. This will be a discussion topic at the NCSLI MCP Committee Meeting in July.

Jeff Gust, Verizon, <jeff.gust@verizon.gte.com> is interested in starting a new resistance ILC. A plaque was given to Jeff at MSC for completion of his past NCSLI Resistance ILC and presentation at NCSLI Toronto.

Tom Larason, NIST, <thomas.larason@nist.gov> announced the need for a new UV ILC. Tom coordinated a UV ILC in the early 1990s.

I attended the NIST/DOD Microwave Calibration Coordination Group meeting at NIST Boulder, CO. While in Boulder, I visited Marc Buttler at Micro-Motion Inc. I presented Marc with a plaque for his coordination effort of the 1998 “NCSL Mass Flow Measurement Comparison Program.” Marc presented the results of this ILC at NCSLI Albuquerque in 1998.

Mike Cruz, prior chairman of this committee, has retired as Laboratory Director of the Navy Primary Standards Laboratory. He will leave June 7th for a cross-country bicycle trip from San Francisco, up the Pacific coast, and across the northern tier of the United States to finish in Boston. A retirement party was held at the NAS North Island Officers Club on May 24th.

John Cable, Honeywell FM&T, <jcable@kcp.com>, coordinates the IEEE Microwave Theory and Techniques ARFTG round robin in support of automatic network analyzers. The following connector types are supported in the round robin effort. Thanks to John Cable for providing this information. Note the new 7-16 connector.

ARFTG MCP ILC Points of Contact

2.4 mm connector, Bart Schrijver, Agilent Technologies. Phone (707) 577-2495, FAX (707) 577-5484, e-mail <bart_schrijver@agilent.com>

2.92 mm/K connector, Gilbert Perez, Anritsu. Phone (408) 778-2000 ext . 4950, FAX (408) 778-4010, e-mail <gperez@nam.us.anritsu.com>

3.5 mm connector, Phil Yates, JPL. Phone (818) 393-3705, FAX (818) 354-8153, e-mail <pyates@jpl.nasa.gov>

GPC-7 connector, Yeou-Song (Brian) Lee, Anritsu. Phone (408) 778-2000 ext. 4976, FAX (408) 778-4010, e-mail <brian-ys.lee@anritsu.com>

7-16 connector, Greg Burns, Northrop Grumman. Phone (410) 765-7331, FAX(410) 765-7370, e-mail <burns_john@postal.easd.northgrum.com>

Type 'N' connector, John Cable, Honeywell FM&T. Phone (816) 997-4361, FAX (816) 997-3803, e-mail <jcable@kcp.com>[ARFTG MCP Com.Ch.]

Let me know what you would like to see from the MCP Committee on our webpage <www.ncslinternational.org>. One suggestion would be to have examples of ILCs available. Craig Gulk helped me put a MCP Committee database of past committee articles on the server. It can be sorted by measurement area. It can be found under Highlights on the left-hand menu screen.

For more information about the committee contact me at (619) 545-9705, FAX (619) 545-9861 or <wheelercj@navair.navy.mil>.

INTRINSIC & DERIVED STANDARDS
John Ball

The NCSLI Intrinsic and Derived Standards Committee met during the 2001 Measurement Science Conference at Anaheim. The following summarizes its current activities:

- Bob Hardy is finalizing the Two-Temperature Two-Pressure Humidity RISP. The next step is to circulate the RISP to the NCSLI Board of Directors for review and approval.
- Clark Hamilton has a final draft of the revised RISP-1, Array Josephson Junction, in circulation to the IDS Committee. The final draft will be discussed at the 2001 NCSLI Conference and then will be submitted to the NCSLI Board of Directors for review and approval.
- The Triple Point of Argon RISP working group is nearing completion of its document.

CONSENSUS STANDARDS
Tom Diven

Tom Diven, Lockheed Martin, has agreed to become the new committee chair of the Consensus Standards Committee. He is currently reviewing the Committee Charter, Goals and Objectives. He is planning his first committee meeting at the 2001 NCSLI Conference. The first order of business will be to recruit new members for the Committee and to review and revise the Goals and Objectives.

U.S. MEASUREMENT REQUIREMENTS
Jeff Walden

The USNMC met on January 17, 2001 during the Measurement Science Conference in Anaheim, California. Minutes of that meeting are included below. The meeting agenda was the following: Followup on the July 2000 meeting; discuss the final US National Measurement Requirements report; and discuss the survey process.

Discussion, which began in Toronto during the NCSLI Symposium, continued on the survey process and ways to improve the number of responses, especially from the private sector. Various suggestions were offered and are included in the minutes from the January 17, 2001 Meeting, which are summarized below:

- Dick Pettit reported that the final USNMC 2000 report has been approved and will be included on the CD of publications sent to all NCSLI member delegates.
- Dick also suggested that there should be a "normal" handoff of the report from NCSLI to NIST. It was agreed that this could be accomplished by means of a letter from the NCSLI president to NIST. Jeff Walden will send a draft of that letter to John Ragdale through Dick Pettit.
• Chet Franklin will provide NIST with more information on responses to NIST services.
• Chet Franklin will provide Craig Gukla with input for the NCSLI Newsletter.
• Chet Franklin will work with Craig Gukla to establish a link on the NCSLI website to the NRC survey.
• Chet Franklin will work with Craig to consider a bulletin board/forum and investigate automated (e-mail) response to web visitors.
• Committee chairs will be provided with a copy of the current survey for review and to make suggestions for improvements.

CANADIAN MEASUREMENT REQUIREMENTS
Les Peer and Lorraine Yeomans

The committee has completed its survey report titled "1997/1998 Canadian National Measurement Requirements survey with response from NRC" and included all comments obtained from the NCSLI Board of Directors. The report was sent to Craig Gukla for publication. In due course, the committee will initiate another survey as the NRC has expressed their interest in ongoing surveys as one of many ways used to assist them in maintaining the quality of their services.

CHEMICAL METROLOGY COMMITTEE
Tom Ouimet

The Chemical Metrology Committee (CMC) met during PITTCON 2001 on March 6, 2001 at the Hampton Inn & Suites, New Orleans, LA in conjunction with PITTCON 2001. There were seven attendees: Ernest Garner - NIST. Retired, James McLaren, NRC INMS, Warren Merkel, A2LA; Yoshito Mitani, CENAM, Thomas Ouimet, Eastman Kodak Company, Wolfhard Wegscheider, University of Leoben, Austria, CITAC Chairman, and Chris Williams, Abbott Laboratories.

The first order of business was to welcome Dr. Wolfhard Wegscheider, Chairman of CITAC (Co-Operation on International Traceability in Analytical Chemistry). During the meeting, the notes from the July 2000 meeting in Toronto and action items, as well as the goals and objectives of CMC for 2001 and beyond, were reviewed. In addition, the abstracts submitted for presentation at the 2001 NCSLI International Workshop & Symposium were also reviewed.

The majority of the meeting consisted of an open forum, as planned, identifying needs of the chemical metrology community and planning a path forward. The following needs were identified.

• Increase attendance/participation at CMC meetings
• Open discussion to define "Primary Standard"
• Identify answers to the question: "What can this committee do for you?"

The following action items were identified to address the current needs.

• NCSLI/CMC, in conjunction with CITAC, will give a 20-30 minute presentation during a CITAC Symposium at PITTCON 2002 discussing the charter and goals of NCSLI/CMC to the analytical community for the purpose of drawing interest and increase participation in this committee. This presentation to be given by a board member of NCSLI.

• CMC has been successful in generating 7 papers at the 2001 NCSLI International Workshop and Symposium in the area of chemical metrology. The following topics will be discussed.
  • What's happening at NMI's in chemical metrology.
  • Educational sessions discussing benefits of chemical metrology both from NMI and industry perspective, with case studies.
  • Laboratory accreditation requirements as they relate to chemical metrology.
  • The CMC will investigate the process for obtaining a booth at PITTCON 2002 and then work with the NCSLI Business Office on getting and operating an NCSLI booth at the meeting.

The next meeting of CMC will be held in conjunction with the 2001 NCSLI International Workshop and Symposium during the week of July 30-August 3 in Washington, DC. NIST is organizing a tour of the Gaithersburg site, in conjunction with the Workshop & Symposium, to be held on Friday August 3, 2001. The tour will include several stops in the Chemical Science and Technology Laboratory. More tour information can be found on the <www.ncslinternational.org> website, as it becomes available.

********

INDUSTRIAL PROGRAMS
Steven Stehle, V.P.

HEALTH CARE METROLOGY
Charles Lord

Charles Lord is stepping down as chairman of Health Care effective with the July Conference, recommending Todd McCullough from PCI as his replacement. Charles has invited Todd to attend the BoD meeting July 29th to meet the board. Charles is organizing a series of meetings at the July conference, inviting representatives from the FDA to attend.

UTILITIES
Kent Crow

There have been no official actions within the Utilities Committee since the January meeting.

There is a committee meeting scheduled for Washington on Monday July 30, from 4 to 6 pm. A partial agenda for the meeting will include a presentation by Dr. John Rumble, Jr. of NIST, a status update on RP-10 revision, presentation by Jeff Brown, of Brunswick Nuclear Power Plant on benchmarking activities, and a proposal for dividing into two subcommittees (standards labs and site-support labs).

BENCHMARKING
John Wade Keith III

EQUIPMENT MANAGEMENT FORUM
Rod Parchinski

AIRLINE METROLOGY
Rick Mooney

A Spring Airline Metrology committee meeting was scheduled May 2, 2001, at the American Airlines Maintenance and Engineering Center, Tulsa, Oklahoma.
AUTOMOTIVE INDUSTRY METROLOGY
Lori Jester

Have contacted Lori Jester, committee chairperson. She will not be attending the conference due to travel restrictions.

TESTING LABORATORIES

TELECOMMUNICATION

DIMENSIONAL COMMITTEE
Ed Pritchard

A meeting of the NCSL-International Dimensional Committee was held at the IDW2001 Workshop in Knoxville Tennessee. There were 16 people present, including John Ragsdale, the current President of NCSL-International, and Steve Stahley, the Vice President for Industrial Programs and related committees.

Dennis Swyt, from NIST, made a presentation on a project he would like to see the committee take on. It involves documenting alternate traceability paths which manufacturers could take, other than back to NIST. He made a good pitch for his proposal, but the general consensus was that this is too difficult a task for this committee to tackle as its first project.

Side discussions held with Jim Salsbury brought forth a possible project that the committee could start as their initial project. Jim suggested that we put together a RISP or RP that gave several examples of Uncertainty Budgets for all of the different Dimensional Measurement disciplines. Jim is willing to help Chair the committee if we start with something such as this. After talking to representatives from several accredited labs present, I felt that it was possible to accomplish this task by next Spring.

If you would be willing to work on this project, or if you can provide examples of Uncertainty Budgets for dimensional disciplines which are accredited within your lab, it would be appreciated. We will be meeting again in D.C. at the NCSLI Conference, and also plan to have on-going communications on this project between now and then.

I urge you to come forth and help us so that this document will be beneficial to all labs, both large and small, that are planning to go for accreditation.

********

DOCUMENTARY STANDARDS
John Wehrmeyer, V.P.

Activities:

As usual, the Documentary Standards Committees are quite active as evidenced in their more detailed reports below. I would just like to highlight a few of the activities.

The draft of the Laboratory Manager's Guidebook has been reviewed as should be published soon. I think the membership will find this document very useful and even better than the previous edition. Much of the credit for bringing the Guidebook to this point goes to Bill Sorrells, the previous Documentary Standards VP.

All the member delegates should have received their copy of the “Golden” ANSI/ISO/IEC 17025:2000 by now. I believe this is a historic event as this first time that NCSLI International has adopted a standard jointly with other organizations such as the ASQ and the ASTM. You can read more about this in Jesse Morse's report.

A new NSCL International Position Statement on Use of the SI System of Units has been written. (See page 5 for the paper.)

Larry Nielsen and his Accreditation Resources committee have been hard at work on a Guidebook to help laboratories become accredited. Look for this to come out later this year. I think you will be impressed.

Committee activities:

LABORATORY EVALUATION RESOURCES
David Dikken

This Committee has been working on the preparation of a practical guide to assist with the calculation of measurement uncertainty. The committee had a productive meeting in January at the Measurement Science Conference. John P. Clark of Westinghouse Savannah River Site led the meeting. The primary goal continues to be the work of writing a document to assist engineers, quality assurance managers, technicians and metrologists with the calculation of measurement uncertainty. Effort is being made to present the model with clarity while remaining true to the GUM. The writing group has made slow progress in the technical writing assignments. The technical writing group is following the outline below.

Section Writer/Reviewer
1. Scope/Purpose David Dikken
2. References All writers
3. Definitions per VIM Pending assignment
4. Statistical Tools John Wehrmeyer
5. Overview Jerry Everhart
6. Model Process Ricardo Nicholas
7. System Equation Gordy Skattum
8. Approach to budgeting Ricardo Nicholas
9. Calculations Ricardo Nicholas
10. Reporting David Dikken
11. Evaluation Gordy Skattum
Appendix: Examples

Ricardo Nicholas of Boeing has submitted documentation from the Boeing Company which will serve as a building point for the larger work.

The next meeting will be at the National Conference in Washington D.C.

LABORATORY FACILITIES
David Braudaway
Doug Cooper

Basically there is nothing new to report from the Laboratory Facilities Committee for the current quarter. The plan for a meeting at the MSC was thwarted by last-minute changes in meeting schedules for many of the committee regulars. Informal meetings were held by the few who were able to attend the MSC.
Plan is to meet at the NCSLI Conference in Washington. It is noted that a significantly larger committee attendance has been possible at the NCSLI meetings than at the MSC. However, we have often faced the problem of multiple committee membership with simultaneous meetings.

The current work under consideration is review of the possibility of preparing an RP on the initial and periodic verification of environments in new laboratories. In concept, this would insure a uniform basis for evaluating the environments achieved and should be reflected in a more thorough understanding of specifications.

Work is underway by Doug Cooper to prepare an article or articles on some laboratories installed around the world. This is intended for the NCSLI International Newsletter and is an old assignment.

**METROLOGY PRACTICES**

**Howard Castrup**

The committee continues to work toward revision or development of RPs for calibration interval analysis, measurement decision risk analysis, SPC and Bayesian methods, and metrology decision support analysis.

**Calibration Intervals:**

The subcommittee is continuing development of administrative guidelines for interval analysis and methods for setting parameter calibration intervals. The subcommittee chair, Don Wyatt of Diversified Data Systems, is working on data management models that will optimize such analyses.

**Assigned Tasks:**

**Description** | **Assigned To**
--- | ---
R&D for parameter behavior models | H. Castrup
New Estimation Methods | R. Kacker, S. Dwyer, H. Castrup
New Reliability Models | H. Castrup, D. Deaver (non-linear parameter drift)
Reduced test point modeling | D. Deaver (will provide NIST references)
Parameter interval data | D. Deaver, H. Castrup

**Measurement Decision Risk Analysis:**

Subcommittee chair, Chris Grachanen of Compaq Computer Corporation, has been refining the RP outline and gathering source material.

**Assigned Tasks:**

**Description** | **Assigned To**
--- | ---
Draft of a two-pager on risk assessment variables and methods | H. Castrup
Draft review and comment | Subcommittee
Final | H. Castrup
Publish in Newsletter/NCSLI Web Site | TBD
Ideas on subtopics for outline topics | Subcommittee
Obtain copies of NASA 1342 | Subcommittee
Compile NCSLI/MSC document references relating to risk analysis | C. Grachanen
Compile references and identify sources for risk analysis papers, etc. | H. Castrup
Provide supplemental documentation for Nicholas NCSLI 1999 paper | R. Nicholas

**ANSI/NCSLI WRITING COMMITTEE**

**Jesse Morse**

Although there have been no meetings since MSC, there has been a great deal of committee activity. If you missed the MSC meeting, the audio track is available in Real Audio at <www.ncslinternational.org/committees/5250/index.cfm?id_com=174>.

Most notable is the final publication of ANSI/ISO/IEC 17025:2000 in April, after the signing of the royalty agreement between NCSLI and ANSI. The sales price to Member organizations is $50 and Non-Member is $70.

The accredited writing committee "174" completed its scheduled audit with ANSI. Jay Moskowitz and Katie Calder from ANSI held a post "174" audit findings review via teleconference in April, with Jesse Morse, Committee Chairman, Craig Gulka, ANSI Secretariat and John Wehrmeyer, VP for Documentary Standards. We believe the results of the audit, which began last December, are commendable.

ANSI has made several good suggestions on how we might operate the committee in the future to make future audits less strenuous than this one. We expect to receive the "Audit Report" from ANSI in May, at which time Craig Gulka and the committee officers will begin work in earnest to resolve the findings to ANSI's satisfaction.

Membership has recently received two letter ballots; one addressing some administrative issues, and one addressing membership.

The issues being voted on are:

1. To adopt a proposed "SI Unit Policy" for guidance in future standards development activity.
2. To adopt a proposed "Patent Policy". (Recommended by ANSI)
3. To adopt a proposed "Record Retention Policy".
4. Approval to revise Z540-1-1999 before its extension expires in July 2002. (Working Group 1, headed by Bill Quigley, is tasked with the revision effort under the direction of the 174 Committee.)
Committee News

We intend to use more letter balloting to gain momentum in accomplishing committee business in the future.

Work continues in “cleaning” up the Membership list. We expect to develop a policy to help manage this aspect of the committee under the guidance of ANSI.

The next committee meeting will be at the NCSLI Conference in Washington, DC. Check the conference brochure for time and place. The committee meeting is always open to the general attendance.

There will be a Special Session on Thursday (8/2) in Washington, DC, just prior to the close of the Conference. All attendees are invited to attend this panel discussion, hosted by John Wehrmeyer, VP Documentation and Standards.

ACCREDITATION RESOURCES
Larry E. Nielsen

The most recent meeting was held on Wednesday, January 17, at the Disneyland Hotel as part of the 2001 Measurement Science Conference in Anaheim, CA. Since the last meeting, work continues on the four projects identified by the committee as near and longer-term deliverables to the general membership as follows.

Web Site Development

A new Forums area has been established by the business office for the 175 committee on the NCSLI website. Committee members are becoming familiar with its properties. Jim Allred will be the acting moderator for the group for what we hope will become a useful tool for members, and those interested in committee activities. Our long-term goal remains to develop an interactive Accreditation Resources page with information and links to resources similar to the current 161 committee (Training Resources) page.

Laboratory Accreditation

On May 30, the final draft of RP-16, Practical Guide to Achieving Laboratory Accreditation, was distributed to committee members for a final round of review and comments. Review comments will be discussed at the national meeting in Washington, DC, and incorporated in the draft immediately following the meeting. Our goal remains to get the completed document to the Publications VP for processing, and reviewed and voted upon by the Board of Directors by the October meeting in time for publication in January, 2002.

Laboratory Capabilities

Jim Jenkins is incorporating comments received on the first draft of the rewrite of RP-9, Calibration Laboratory Capability Documentation Guidelines, and our current goal is to have a second draft available for review and discussion in time for the national conference in July. Jim’s work so far offers an excellent multiple choice, non-prescriptive approach to this subject.

Seminars & Tutorials

Development and status of accreditation-related seminars and tutorials will be a topic of discussion at the upcoming meeting. Ken Parson is adding to his popular series of tutorials on laboratory accreditation and quality manual preparation with a new topic offering an in-depth review of ISO/IEC 17025. We hope to learn about Ken’s experiences during our next meeting.

The next meeting will be held Tuesday, July 31, 2001, from 4:15 to 6:00 pm in the Jefferson West room of the Conference hotel.
Charlie and Ruth Motzko seem pretty relaxed, considering he gets to run this complex organization next year. NCSL Treasurer Leon Barnes (L) always reminds me of the infamous Kenneth Starr: or is Charlie an investigation target?

Georgia Harris (L) and Dave Nebel trade opinions, while Dave Abell and Jim Crane pay attention.

NCSL President John Ragsdale (sitting) and Larry Yates find time away from the dinner event to discuss membership initiatives.

NCSL Secretary Dave Agy and Max Green discuss some business at the Board dinner.

With a grand panorama of Cincinnati in the backdrop, it is hard to tell if our group is posing high in a downtown skyscraper, or if these are just super photographs in the wall panels. The venues of NCSL Board meetings are usually chosen for being interesting cities. This meeting was scheduled for the Midwest, at Cincinnati. I was born and raised about 100 miles away, so I won't comment on the word "interesting."

Ed and Catherine Pritchard spend some social time with Linda and Larry Yates in a pre-dinner gathering.
NIST POLICY ON TRACEABILITY
Dr. Rich Kayser

The National Institute of Standards and Technology (NIST) has recently developed an organizational policy on traceability and a set of related supplementary materials, which includes answers to questions frequently asked by customers of NIST measurement services. The policy, supplementary materials and related documents can be accessed at <http://www.nist.gov/traceability>. These documents are intended to serve as a resource for NIST customers. Comments and questions are welcome and may be submitted to <traceability@nist.gov>.

NIST is responsible for developing, maintaining and disseminating national standards - realizations of the SI - for the basic measurement quantities, and for many derived measurement quantities. NIST is also responsible for assessing the measurement uncertainties associated with the values assigned to these measurement standards. As such, the concept of measurement traceability is central to NIST’s mission.

NIST’s customers frequently ask questions about traceability and about NIST’s role in traceability. It is not always obvious what NIST’s role is in helping other organizations establish traceability of their measurement results to standards developed and maintained by NIST.

The primary purpose of the NIST Policy on Traceability is to state the NIST role with respect to traceability. The policy presents the definition of measurement traceability used by NIST, and clarifies the roles of NIST and others in achieving traceability of measurement results for measurements both internal and external to NIST.

The policy also addresses the role of NIST in providing its customers with the tools they need (a) to assist them in establishing traceability of their measurement results, and (b) to assess the claims of traceability made by others. This is achieved directly through the provision of NIST measurement-related products and services, through collaboration with relevant organizations, through development and dissemination of technical information on traceability, and through conducting coordinated outreach programs.

Associated supplementary materials include answers to frequently asked questions - about traceability, about establishing traceability, about NIST and NIST’s role in traceability, NIST products and services, and mutual recognition arrangements and agreements. The materials also include examples of NIST programs in traceability, a glossary of key terms, references and a checklist for traceability through calibration.

The NIST Policy on Traceability, along with supplementary materials and NIST technical publications, supports NIST in articulating a consistent message regarding its role in traceability, and provides a basis for NIST to focus its efforts on needed communication and training areas. Related NIST outreach programs, referenced in the policy, also represent and articulate the NIST role in traceability.

EUROPEAN UNION’S MEASURING INSTRUMENT DIRECTIVE (MID)
(Response requested)

The European Commission has developed a proposal put forward to the European Council and Parliament called the MID. The MID is a New Approach Directive covering traditional legal metrology instruments, listing essential requirements and conformity assessment options for their entry into the European market.

In general, the MID specifies the performance specifications of the instruments for European type approval and outlines a metrology CE mark for approved instruments. This is an area in which the member states of the European Union, the United States, and many other nations have been defining harmonized requirements issued in International Recommendations within 1OIML. The U.S. Department of State has delegated NIST to be the U.S. technical representation in the OIML.

The Measuring Instrument Directive covers the following general areas: utility meters; liquids other than water; taximeters; breath analyzers; exhaust gas analyzers; automatic weighing instruments; material measures (length, capacity); and, dimensional measuring instruments (length, area, and multidimensional). In commercial transactions, many of these instruments establish the measured quantity and thus equity in trading. The value of this equity trade is estimated to be on the order of 10% of GDP.

There are several possible U.S. concerns about the proposed Directive:

1. The MID could potentially impede market access for U.S. manufactured measuring instruments
2. Many requirements in the MID differ significantly from comparable OIML International Recommendations
3. The MID contains no provisions for the acceptance of non-European conformity assessment, thus necessitating a new round of mutual recognition agreements
4. Throughout OIML technical work, the European member states are exerting considerable pressure to adopt requirements of the proposed MID even before its adoption.

NIST is therefore soliciting comments on the MID from affected U.S. parties. The deadline for comments is August 3, 2001. NIST will compile the comments it receives and forward a U.S. position on the MID to the European Commission. Copies of the MID document and comment form can be downloaded from <http://ts.nist.gov/ts/hdocs/210/215/directives.htm>. For any further information please contact: Dr. Ambler Thompson, NIST, Technical Standards Activities Program, 301-975-2333, <ambler@nist.gov>.

1 OIML is an international treaty organization recognized as an international standardizing body with liaison status to the World Trade Organization's Technical Barriers to Trade Committee.
THE BIPM KEY COMPARISON AND CALIBRATION DATABASE (KCDB)

T. J. Quinn,
Director, BIPM, Sores, France

In October 1999, the directors of the national metrology institutes of the industrialized states of the world signed a Mutual Recognition Arrangement (MRA) for national measurement standards and for calibration and measurement certificates issued by their institutes.

The principal output of this MRA is a database at the BIPM <www.bipm.org> containing the results of key comparisons of national measurement standards and extensive lists of the calibration and measurement capabilities of the world’s national metrology institutes (NMIs).

Key comparisons

About 350 key comparisons have been designated and are now being carried out by the NMIs. Some have already been completed and the results entered in to the KCDB. The first round of key comparisons is expected to take two or three years to complete. Key comparisons are repeated from time to time, to maintain an up-to-date picture of the equivalence of national measurement standards.

Calibration and measurement capabilities

Some ten thousand lines of data on the calibration and measurement capabilities (CMCs) of the participating NMIs are now included in the KCDB. These principally concern the fields of electricity and magnetism, length, ionizing radiation, photometry and radiometry. Before the end of the year it is expected to add CMCs for gas mixtures, the beginning of a very extensive list in chemistry.

These statements of the calibration and measurement capabilities include a full description of the service in question and, most importantly, the uncertainty with which it is offered to clients. These uncertainty statements are examined carefully during the process laid down in the MRA and are reviewed in the light of the results of key comparisons and of other factors that contribute to the reliability of the measurements.

The main aim of the MRA is to provide reliable technical data on the performance of the national metrology institutes which can be used as a sound basis for wider agreements related to international trade, commerce and regulatory affairs.

The MRA was drawn up by the International Committee of Weights and Measures (CIPM), under the authority given to it in the Metre Convention, for signature by directors of the NMIs of Member States of the Convention and Associate States of the General Conference of Weights and Measures.

Objectives

- to establish the degree of equivalence of national measurement standards maintained by NMIs;
- to provide for the mutual recognition of calibration and measurement certificates issued by NMIs,
- thereby to provide governments and other parties with a secure technical foundation for wider agreements related to international trade, commerce and regulatory affairs.

Process

- international comparisons of measurements, to be known as key and supplementary comparisons;
- quality systems and demonstrations of competence by NMIs.

Outcome

- statements of the calibration and measurement capabilities of each NMI in the BIPM key comparison and calibration database (KCDB) maintained by the BIPM and publicly available on the BIPM website <http://www.bipm.org>.

Engagement

NMI directors sign the MRA with the approval of the appropriate authorities in their own country and thereby:

- accept the process specified in the MRA for establishing the database;
- recognize the results of key and supplementary comparisons as stated in the KCDB;
- recognize the calibration and measurement capabilities of other participating NMI as stated in the KCDB.

Exclusions

- signature of the MRA engages NMIs but not necessarily any other agency in their country;
- responsibility for the results of calibrations and measurements rests wholly with the NMI that makes them and is not, through the MRA, extended to any other participating NMI.

Organizational structure

- overall coordination is by the BIPM under the authority of the CIPM, which is itself under the authority of the Member States of the Metre Convention;
- the Consultative Committees of the CIPM, the Regional Metrology Organizations and the BIPM are responsible for carrying out the key and supplementary comparisons;
- a Joint Committee of the Regional Metrology Organizations and the BIPM (the ICRB) is responsible for analysing and transmitting entries into the KCDB for the calibration and measurement capabilities declared by the NMIs.
ADMINISTRATION SEeks $496 MILLION FOR TECHNOLOGY ADMINISTRATION IN FY 2002

President Bush has submitted to Congress a fiscal year 2002 budget request for the Commerce Department’s Technology Administration of $496 million. The NIST portion of the proposed budget is $487.5 million.

Included in the FY 2002 request are four separate appropriations: $8.2 million for the Office of the Under Secretary and the Office of Technology Policy at TA; $347.3 million for Scientific and Technical Research and Services (including $336.9 million for the NIST Laboratories, $5.4 million for the Baldrige National Quality Program and $5 million for the Critical Infrastructure Protection Grants Program); $119.3 million for Industrial Technology Services (including $13 million for the Advanced Technology Program and $106.3 million for the Manufacturing Extension Partnership); and $20.9 million for Construction of Research Facilities to maintain and improve existing facilities at NIST’s Gaithersburg, Md., and Boulder, Colo., laboratories.

The CIPGP ($5 million) would fund research—not currently being done by the private sector or other government agencies—to protect critical information infrastructures for civilian and commercial use. The ATP request ($13 million), combined with estimated carryover from the previous year and recoveries, would provide an operating budget of $79.9 million, which would cover continued funding requirements for previous awards. The administration proposes that no new awards be made in FY 2002 while the ATP is evaluated by the Commerce Department.

More data on the proposed FY 2002 budget for TA and NIST, as well as budget histories from previous fiscal years, can be obtained via the World Wide Web at <www.nist.gov/public_affairs/budget.htm>.

********

ANDERSON TO HEAD ELECTRONICS AND ELECTRICAL ENGINEERING LAB

William E. Anderson has been named as director of NIST's Electronics and Electrical Engineering Laboratory. He has served as acting director of EEEL since 1999, when Judson French retired after several decades as EEEL Director.

EEEL provides the fundamental basis for all electrical measurements in the United States. In close consultation with industry, research and calibration programs are tailored to meet the most critical measurement needs for the manufacture and operation of electrical and electronic systems, including semiconductor, magnetic, radio-frequency, microwave, optical, optoelectronic and superconducting equipment; flat-panel displays; electronic instrumentation; and electrical power apparatus and systems.

Other programs are working on quantum standards for more accurate fundamental electrical units, measurements critical to the development of advanced technologies (such as high-temperature superconductors) and standards for the law enforcement community.

Anderson joined NIST in 1972 as a presidential intern and initially was responsible for high-voltage metrology in the Electricity Division. In 1988, he became leader of EEEL's Applied Electrical Measurements Group. In 1993, Anderson was detailed to the NIST Program Office, ultimately assuming the role of senior program analyst. He returned to EEEL in 1994 to become chief of the Electricity Division, a position which he held until becoming deputy director of the laboratory in 1999. Contact: Michael E. Newman, (301) 975-3025, <michael.newman@nist.gov>

********

GETTING THE BETTER OF EINSTEIN FOR ONCE

Researchers at the NIST Boulder Laboratories have convincingly demonstrated one of the basic tenets of quantum mechanics (referred to as QM) and, in the process, refuted a concept embraced by Albert Einstein.

The NIST experiment—reported in Nature on Feb. 15, 2001—measured correlations between two massive entangled particles (singly ionized beryllium atoms).

QM holds that many properties of particles are not determined until they are measured or observed in some fashion, and also that two particles can be put into a condition whereby an observation of one of them is instantly transmitted (faster than the speed of light) to affect the other. Einstein, along with his colleagues Boris Podolsky and Nathan Rosen, believed that the quantum mechanical view of the universe was "incomplete" and proposed that there were "hidden variables" of some unknown nature that could explain the puzzling QM phenomena.

Previous tests of the hidden variable theory have been limited by two loopholes. One has to do with the possibility of an unknown signal passing between parts of the apparatus and contaminating results (called the "lightcone" or "locality" loophole), and the other with assumptions made about whether the measured results of an experiment were representative of all the results of that experiment (the "detection" or "fair sampling" loophole). In the NIST experiment, a measurement outcome was recorded for every run of the experiment, so that no assumptions had to be made about fair sampling, thus firmly closing the detection loophole.

Previous experiments by others eliminated the lightcone loophole but not the detection loophole. Contact: Collier Smith (Boulder), (303) 497-3198, <smithcn@boulder.nist.gov>
STUDENTS HELP RENOVA TE A PART OF WW II AND NIST HISTORY

A forerunner of today's "smart weapons," the Bat of World War II was the first totally automated guided missile employed by the United States. Like its namesake which uses sonar (sound waves) for locating objects, the Bat emitted radar (radio waves) pulses that reflected off an enemy ship or other offshore object to target its path. The National Institute of Standards and Technology, then known as the National Bureau of Standards, was a major contributor in the missile's development during the 1940s.

During the summer of 2000, the remains of a Bat missile were discovered in a NIST Gaithersburg, Md., warehouse. The 4-meter (12-foot) long, 3-meter (10-foot) wingspan, flying bomb was tattered and worn after more than 50 years in storage, yet its fuselage, wings and tail assembly were still intact (the interior mechanisms including the warhead had been discarded years ago). NIST's Office of Information Services, curator of the history museum at the agency's Maryland headquarters, decided to add the Bat to its collection. But first, a renovation of the missile was in order.

Fortunately for NIST, a local academic institution, Frederick Community College, runs an aviation maintenance program that provided the needed expertise for the job. Students from FCC have been working with NIST staff since January to repair, clean, paint and reassemble the Bat. Completion of the project is expected by the first week in March.

Contact: Michael E. Newman, (301) 975-3025, <michael.newman@nist.gov>

**********

XCALIBIR CUTS A PATH TO ADVANCED MICROCHIPS

To build smaller and smaller microchips, one part of the semiconductor industry has to get larger. Silicon wafers—the high-tech canvases upon which multiple integrated circuits are printed—currently run about 200 millimeters (8 inches) in diameter. If the industry could move up to a 300-millimeter (12-inch) disk, more than twice the number of chips could be built at a single time.

However, larger wafers demand exceedingly accurate measurements of flatness and thickness, while advanced lithography (printing) systems require exact assessments of the curvature of the specialized lenses and mirrors used. And to make things even more difficult, the readings have to be consistently within 0.25 nanometer (10 billionths of an inch), equivalent to the diameter of one or two atoms.

Like its namesake, the fabled sword that won England for King Arthur; a National Institute of Standards and Technology-developed device called XCALIBIR (for X-Ray Optics CALibration Interferometer) may help the United States meet these needs and continue its reign atop the world's microelectronics throne.

Like the optician whose tools provide accurate data on lens thickness and curvature, XCALIBIR's operators hope to provide American semiconductor manufacturers with atomic-level measurements of their "eyeglasses"—the optics by which circuit patterns are affixed to silicon wafers. Achieving such precise measurements requires XCALIBIR to be housed in an enclosure that controls the temperature to within 0.05 degree Celsius. It also must sit atop a 15-metric ton (16-ton) granite table that suppresses measurement-upsetting vibrations.

The instrument currently is undergoing performance testing.

Contact: John Blair, (301) 975-4261, <john.blair@nist.gov>

**********

BRINGING POLYMER PATTERNS INTO FOCUS

Semiconductor chips, with their 20-plus layers and Lilliputian linewidths, represent the ultimate measurement and quality control challenge. And now as manufacturers move to linewidths too small to be seen with optical microscopes, the task is getting even harder. With partial funding from the Defense Advanced Research Projects Agency and in cooperation with the IBM T.J. Watson Research Center, NIST researchers are using neutrons to improve the tools available for precision measurements of polymer "resists" used as "molds" for semiconductor circuit patterns.

Using a technique called small angle neutron scattering, the researchers aim a focused neutron beam through a silicon wafer patterned with a complex, one micrometer (0.00004 inch, or equivalent to the diameter of a red blood cell) thick polymer layer. The neutrons are scattered by the grating-like polymer pattern but are unaffected by the relatively thick silicon substrate.

The technique allows accurate measurement of the shape, size and roughness of polymer structures 100 to 300 nanometers (one-tenth to three-tenths of a micrometer) wide. In addition, unlike current imaging techniques such as electron or atomic force microscopy, neutron scattering does not degrade the sample and becomes easier as the linewidths shrink.

Contact: Pamela Houghtaling, (301) 975-5745, <phoughtaling@nist.gov>

**********

TINY STRUCTURES ARE FOCUS FOR NEW NIST FACILITY

The colorful, swirling image of cobalt atoms arranged on a copper surface (see <www.nist.gov/public_affairs/images/joe.jpg> might look a bit like a high-tech robin's nest, but in reality, it may be a view into the future of electronics.

The image of the 8-nanometer (0.0003 inch) square structure represents one of the first creations of the new Nanoscale Physics Facility at the National Institute of Standards and Technology. NIST physicists designed and built the facility so that they could manipulate and arrange atoms, one by one, into desired patterns on a metallic surface.

"One of our motivations for doing this is to enable the U.S. electronics industry to manufacture smaller, faster and more powerful and versatile communications devices and computers," says project leader Joseph Strocio.

In the not-too-distant future, as electronic chip features shrink, they will approach the boundary between classical and quantum laws of physics. At the quantum level, single atoms and subatomic particles,
like electrons or photons, can behave in very unusual ways unpredictable by the classical laws of physics that govern larger objects.

In the Nanoscale Physics Facility, NIST physicists are exploring the physical effects of quantum phenomena in a new generation of nanoscale devices. By building tiny structures atom by atom, NIST scientists are able to see how the cloud of electrons orbiting each atom changes the fundamental physical properties of the assembled structures.

********

PUTTING A 'WHISKER-FREE' FACE ON ELECTRONIC PARTS

To improve the solderability of electronic device components, manufacturers often deposit a protective coating made with tin or tin-copper alloy upon the parts. However, these coatings can result in the formation of hair-like crystals known as "whiskers." Whiskers, which may extend for several millimeters, can divert current away from its proper path and cause electrical shorts or failures.

To prevent whisker formation in the past, manufacturers added lead to the tin-based coating. Today's lead-free electronics finishing, however, precludes the use of this harmful substance. Therefore, manufacturers are seeking new ways to coat electronic components with tin or tin-copper alloy without the worry of whiskers. To facilitate the development of these methods, materials researchers at the National Institute of Standards and Technology have been studying the basics of why and how whiskers form.

So far, their investigations have revealed seven types (shapes) of whiskers that form with tin and tin-copper alloy coatings. They also have learned that tin whisker growth can be prevented if a thin layer of nickel is deposited on a surface before the tin or tin-copper alloy coating is applied.

Eventually, the NIST researchers hope to devise a test that manufacturers can use to determine the likelihood of whisker formation during the production process. Contact: Pamela Houghtaling, (301) 975-5745, <pighthaling@nist.gov>

********

PRACTICE GUIDE ON PARTICLE SIZE CHARACTERIZATION NOW AVAILABLE

The first in a new publication series, the NIST Recommended Practice Guide: Particle Size Characterization, will help industrial and academic laboratories measure particle size and size distribution of ceramic powders in a more reliable and reproducible way. Improper powder size measurements during processing can affect the mechanical, electrical or thermal properties of the final product, resulting in poor quality and high rejection rates.

Designed for a general user, the guide includes aspects of particle characterization research conducted by NIST for well over a decade. This research also has resulted in the development of standard reference materials and improvements in measurement procedures.

The guide covers techniques commonly used in the ceramics manufacturing industry such as microscopy, sieving, gravitational sedimentation and laser light diffraction. For each technique, the book provides directions for sample preparation, instrument calibration and set-up; details relevant national and international standards; and discusses capabilities, limitations and general principles.

NIST researchers are looking at the challenges presented in the characterization of smaller-size (submicron or nanosize) particles. These powders typically are used in the manufacture of components, such as substrates for computer chips and high-temperature structural materials. NIST plans to hold a workshop on issues related to reliable particle size measurement at the submicron and finer levels in October 2001.

To obtain a copy of NIST Special Publication 960-1, NIST Recommended Practice Guide: Particle Size Characterization, contact Carolyn Sladic, (301) 975-6119, <carolyn.sladic@nist.gov>.

********

REPORTS PRAISE NIST FOR 2000 ACCOMPLISHMENTS

The Visiting Committee on Advanced Technology, NIST's primary private-sector advisory board, has released its annual report that evaluates the agency's fiscal year 2000 performance of its mission to work with U.S. industry to promote economic growth. The report, which is submitted to the Secretary of Commerce for transmittal to Congress, reviews and makes recommendations regarding the general policy, organization, budget and programs of NIST.

In the report, the VCAT stated that it "finds NIST to be a significant national asset, unquestionably the world's leading measurement and standards organization." The VCAT also recognized the success and value of NIST's extramural programs, saying that "... the Manufacturing Extension Partnership, Advanced Technology Program and Baldrige National Quality Program furnish key support to small companies, to the development and commercialization of new technologies, and to the quality-based competitiveness of all U.S. organizations."

A second private-sector steering group, the Advanced Technology Program Advisory Committee, also recently issued a report. This one evaluates and praises the FY 2000 activities of NIST's program that provides co-funding for new and innovative industrial research projects that are technically challenging but hold the promise of important economic or social benefits for the nation.

Single copies of the VCAT and ATP Advisory Committee 2000 Annual Reports are available by faxing a request to NIST Public Inquiries, (301) 926-1630, or sending an e-mail message to <inquiries@nist.gov>.

********

PAPER DESCRIBES NIST SUPPORT FOR OPTICAL FIBER INDUSTRY

In response to rapid changes in fiber optic technology, NIST is developing techniques and standards to support the measurement of optical components and subsystems used in wavelength multiplexed (known as WDM) optical fiber communication systems. A new paper describes the development of wavelength calibration transfer standards and the accurate measurement of spectral response, dispersion, and polarization dependence of optical fiber and components.
In the area of wavelength calibration, NIST has developed Standard Reference Material transfer standards based on rotational-vibrational transitions in acetylene and hydrogen cyanide molecules. The SRMs were designed for calibrating wavelength-measuring instruments such as optical spectrum analyzers and wavelength meters. New work is focused on molecules of carbon monoxide as an SRM for the new WDM-L band.

NIST’s spectral measurement system uses the calibrated wavelength meter and a tunable diode laser source to measure the transmittance and reflectance of WDM components. Wavelength filters are needed to remove amplified spontaneous emission produced by the diode laser. NIST recently conducted a round robin measurement intercomparison to assess current measurement capabilities for wavelength filters. The agency is working with the Telecommunications Industry Association to develop standard test procedures and evaluate measurement capabilities.

Concerning chromatic dispersion, NIST has developed two systems to measure relative group delay which broadens pulses and limits the system data rate. One system is based on low-coherence interferometry, the other is a more conventional rf-modulated phase-delay method. After compensating for chromatic dispersion, the next significant mechanism for pulse-broadening is polarization-mode dispersion. NIST supports PMD metrology through two SRMs—SRM 2518, Polarization-Mode Dispersion (Mode-Coupled) and SRM 2538, Polarization-Mode Dispersion (Non-Mode-Coupled).

The paper describing this work, no. 02-01, is available free of charge by contacting Sarabeth Harris, (303) 497-3237; <sarabeth@boulder.nist.gov>.

*********

BIBLIOGRAPHIES OF ELECTRONICS-RELATED WORK NOW AVAILABLE

Each year, the optoelectronics, electronics and electromagnetic research programs of the NIST Boulder, Colo., laboratories publish bibliographies of technical work in those programs dating back to 1970. The 2000 edition of those bibliographies is now available. It includes:

- Metrology for Radio-Frequency Technology, A Bibliography of NIST Publications (NISTIR 5097) listing the publications by the staff of the Radio-Frequency Technology Division (formerly the Electromagnetic Fields Division) from January 1970 through July 2000. Topics covered include antennas, dielectric measurements, electromagnetic interference, microwave metrology, microwave power, impedance and attenuation, near-field antenna measurements, noise, non-ionizing radiation, radiation hazards, remote sensing, standards, time domain and waveform metrology.

- A Bibliography of Publications of the NIST Electromagnetic Technology Division (NISTIR 5098) listing the publications of the staff of this division from January 1970 through July 1999. Topics covered include Josephson array development, nanoscale cryoelectronics, high-performance sensors, infrared detectors, mixers and high-temperature electronics.

- Bibliography of the NIST Optoelectronics Division (NISTIR 5099) featuring most of the papers published by this division and its predecessor organization since 1970. Topics covered include high-speed measurements, continuous-wave-laser radiometry, pulsed-laser radiometry, optical fiber metrology, integrated optic metrology, interferometry and polarimetry, fiber and discrete components, optical materials metrology, advanced fabrication and modeling, and semiconductor growth and devices.

Copies of all three bibliographies are available at no charge from Sarabeth Harris, MC104, NIST, Boulder, Colo. 80305-3328; (303) 497-3237; <sarabeth@boulder.nist.gov>.

*********

100 MV PEAK OUTPUT DEMONSTRATED FOR THE JOSEPHSON WAVEFORM SYNTHESIZER

For the first time EEEL's Electromagnetic Technology Division has been able to synthesize waveforms with peak output voltages exceeding 100 mV using the Josephson waveform synthesizer. This two-times increase in voltage was possible by summing the output voltage of two 4100-junction series arrays. Achieving large output voltages has been difficult with the Josephson synthesizer because the arrays are biased with broadband dc to 18 GHz input waveforms that are not easily divided and summed from different circuits. Fortunately, the recently developed ac coupling technique that divides the low (<10 MHz) and high frequency input signals allows researchers to drive multiple arrays in parallel at high frequency and to bias the arrays in series at low frequency.

Combining the low frequency output waveforms of N arrays in series results in an N-fold increase in output voltage compared to a single array. This is the first time that the output voltage of two arrays has been combined for ac waveforms. Researchers have demonstrated waveforms with 121 mV peak voltage by driving two arrays with a 7.5 GHz sine wave and a 0.5 Gbit/s digital code input signals. The harmonic distortion for a synthesized 5 kHz sine wave was more than 100 dB below the fundamental. This is the lowest distortion measured for any Josephson synthesizer circuit and it demonstrates that both arrays have good operating margins. CONTACT: Sam Benz (303) 497-5258, <benz@boulder.nist.gov>

*********

COMPARISON OF NIST FREQUENCY STANDARDS

A post-processed time scale, involving an ensemble of five hydrogen masers, has been developed by Tom Parker of the Time and Frequency Division in Boulder to serve as a reference for comparing primary frequency standards. During the last two years, this time scale has been used to evaluate the relative frequencies of NIST-7, an optically pumped cesium-beam standard, and NIST-F1, the cesium-fountain frequency standard. The comparisons indicate that the frequencies of NIST-7 and NIST-F1 have remained in agreement within their measured uncertainties over the last two years, thus adding confidence to the methods used for evaluating the uncertainties of the standards. Having completed this overlap of operation with good results, NIST-7 will now be taken out of operation.

It is particularly important to note that this scale allows comparison of frequency standards not operated at exactly the same time. The stability of this time scale, called AT1E, is less than 1 x 10^-15 for averaging times from 1 to 100 days, with a minimum near 3 x 10^-16 at about 20 days. When combined with frequency comparison data obtained through various satellite-based methods, this time scale also provides a means for absolute comparisons of the fre-
frequencies of NIST primary frequency standards with those of other countries.

Measurements show remarkably good agreement among the frequency standards of NIST, France, and Germany. Considering that these standards are of quite different designs, it is clear that the measurement of frequency at these levels is in very good shape. The more recent comparisons of NIST and German cesium-fountain frequency standards have been accomplished using a two-way time-transfer link between these two labs. This link supports comparisons at an uncertainty of less than 1 x 10-15, more than a factor of two better than other comparisons, which are made using the common-view GPS method. The German and NIST fountain standards were found to agree within their uncertainties. Contact: T. E. Parker (303) 497-7881, <tparker@boulder.nist.gov>.

********

FIRST MEASUREMENT REPORTS ISSUED FOR GEOMETRY OF ROCKWELL DIAMOND INDENTERS

Measurement reports of the geometrical parameters of two Rockwell C diamond indenters were issued December 2000 to the Materialprüfungsamt Nordrhein-Westfalen (MPA NRW), Germany. These measurement reports are the first NIST official reports for Rockwell indenter measurements. The two indenters are being used as common indenters for an international Rockwell hardness comparison aimed to establish a worldwide-unified Rockwell hardness scale with metrological traceability.

T. Polzin of MPA NRW is coordinating the international comparison. Because of the high accuracy of its indenter characterization system, NIST was selected to characterize the form of the indenters prior to the start of the international comparison. NIST Rockwell indenter measurements are performed with a microform calibrations system developed in the Precision Engineering Division in 1995 using a stylus instrument. These measurements comprise a special test item of NIST calibration services.

NIST’s microform measurement system currently has the lowest measurement uncertainty for this type of form measurement in the world. For MPA NRW, NIST used the system to measure the indenter parameters of radius, cone angle, deviation from the spherical profile, cone flank straightness, and holder axis alignment error. Contact: John Song (301) 975-3799, <junfong.song@nist.gov>.

********

MEASURENET-GOV SUCCESS AS A USER’S TOOL

The MEASUREnet-gov system was used successfully on November 17, 2000, for a customer-driven training session on ‘‘Youden Chart Analysis of Round Robin Data.’’ MEASUREnet-gov is an Internet-based interactive video conferencing system established by NIST to aid training and collaborative work among NIST and the state metrology laboratories. This training session epitomizes the successful transfer of technical information from NIST to the state metrologists.

The Youden chart analysis has been used for round robin intercomparisons supported by NIST since 1981. With assistance and training from NIST, Ken Fraley, Oklahoma metrologist, has performed the bulk of these analyses in recent years. Fraley developed and conducted the training session for the 11 participating MEASUREnet-gov laboratories. Georgia Harris of the NIST Weights and Measures Program provided resources and guidelines and served as moderator. The PowerPoint presentation and spreadsheet (in Excel format) are available at <http://www.nist.gov/labmetrology>, under ‘‘Technical Resources’’ for review and comment back to Georgia Harris. CONTACT: Georgia Harris (301) 975-4014, <harris@nist.gov>.

********

IMPROVED NIST HOMEPAGE

If you’re a regular user of the NIST site on the World Wide Web, <www.nist.gov>, there’s a pleasant surprise in store on your next visit. And if you haven’t tried out the site before, now is a great time to get acquainted.

An improved, more customer-friendly NIST homepage is now in operation. The homepage’s new features include an extensive ‘‘A to Z’’ subject index, connections to pages designed for special audiences (industry, researchers, the news media and the general public), a link to atomic time in all eight U.S. time zones, up-front access to information on NIST products and services, and a section describing how others can work with the agency.

Visitors to the new NIST homepage also will find several different routes to useful information and favorite sites such as ‘‘NIST in Your House’’ (detailing NIST connections to everyone’s daily life), ‘‘NIST and Your City’’ (detailing NIST connections to communities), the Guide to NIST (short, technical descriptions of several hundred NIST projects), the photo gallery and list of available videos.

Crowning the upgraded NIST homepage is a link to 100 years of NIST history and achievement at the NIST centennial web site, <www.100.nist.gov>.

********

FUNDAMENTAL CONSTANTS

Concurrent with the NIST centennial, the Physics Laboratory has issued a new chart of the best available values for more than 100 of the most widely used fundamental constants in physics and chemistry. A thorough and handy reference for teachers, students and researchers, the chart summarizes the most recent recommended values from CODATA—the Committee on Data for Science and Technology—that was established in 1966 by the International Council of Scientific Unions to improve the quality and reliability of key data in all fields of science and technology. CODATA values are developed after a thorough review and examination of the best available experimental measurements, observations and calculations. NIST has been a significant contributor to CODATA since the committee’s inception.

The new CODATA Recommended Values wall chart (NIST SP-961) is available in two sizes: 17 by 22 inches and 8.5 by 11 inches (English dimensions reflect the standard paper sizes used in U.S. printing). An abbreviated set of the constants is available on a wallet card (NIST SP-959).
To request copies, send e-mail to <enquiries@nist.gov>, call (301) 975-NIST (6478) or fax to (301) 926-1630. A complete list of the recommended values of the fundamental constants of physics and chemistry is available online at <http://physics.nist.gov/cuu/Constants/index.html>.

********

COORDINATE MEASURING MACHINE STREAMLINES DIAMETER MEASUREMENTS

In an effort to streamline the calibration of diameter standards, researchers in the Precision Engineering Division have carried out a careful investigation of the uncertainty of diameter measurements using their Moore M48 Coordinate Measuring Machine. They find that they can achieve uncertainties that are essentially identical to what is attained using more traditional methods requiring dedicated, special-purpose equipment and laborious set-up. Recently they performed their first M48-based calibrations of ring and plug gages for outside customers. Contact: John Stoup (301) 975-3476, <john.stoup@nist.gov>

********

SIM SURFACE ROUGHNESS AND STEP HEIGHT COMPARISON

The Surface Metrology Program of the Precision Engineering Division recently completed measurements of surface roughness and step height for the ongoing Intermountain Metrology System (SIM) Comparison 4.8. The metrological equivalence of national measurement standards and of calibration certificates issued by national metrology institutes is established by a set of key comparisons chosen and organized by the consultative committees of the CIPM or by the regional metrology organizations in collaboration with the consultative committees.

Several countries from the SIM region have decided to carry out a surface roughness and step height regional comparison, with the National Research Council, Canada, as the pilot laboratory. The results of this international comparison will contribute to and be included in the agreement for establishing the metrological equivalence. The NIST participants are scientists Brian Rendgen, Dewey Foreman, John Song, and Ted Vorburger.

The specimens include three commercial step heights of nominal value 2.55 μm, 0.38 μm and 0.030 μm, a commercial roughness specimen with nominal roughness of 0.2 μm, and a prototype of NIST’s sinusoidal roughness blocks, SRM 2073a, a specimen with a nominal Ra of 3 μm. After NIST completed its measurements, the specimens went to Brazil. The other countries involved are Mexico and Argentina. Contact: Ted Vorburger (301) 975-3493, <theodore.vorburger@nist.gov>

********

1904 Baltimore Disaster Made Standards a Hot Issue

When Congress created the National Bureau of Standards (now the National Institute of Standards and Technology) in March 1901, it hoped that the new agency would soon address the problem of divergent measurements and standards (such as eight different definitions of the gallon). Little did the legislators know that within three years, a very different—and dramatic—need for standardization would provide the first test of the fledgling national laboratory’s ability to make a difference.

On the morning of Feb. 7, 1904, a fire broke out in a warehouse in the Baltimore harbor. As flames began spreading through the central business district, the Baltimore fire chief called for help from Washington, D.C. However, engine companies arriving by special train from the capital found themselves helpless when their hoses would not fit Baltimore hydrants. There was no standard thread size at the time for coupling hoses to hydrants. The blaze raged for a total of 30 hours and destroyed some 1,500 buildings over a 70-block area, while one by one, firefighting units from New York, Philadelphia, Annapolis, Wilmington, Atlantic City, Chester, York, Altoona and Harrisburg all arrived to find their efforts cursed by incompatible equipment.

Following the catastrophic, the Secretary of Commerce requested that NBS study the coupling problem. Before the investigation ended, more than 600 sizes and variations in fire-hose couplings were documented across the country. The following year, the National Fire Protection Association, with the assistance of the Bureau, adopted a national coupling standard along with an interchangeable device for non-standard couplings. Contact: Michael E. Newman, (301) 975-3025, <michael.newman@nist.gov>.

********

TECH TRIVIA

The modern era of U.S. aviation was launched with NIST’s help. Before World War I, U.S. military forces had only several dozen aircraft, all obsolete by European standards. Aviation instruments were sent to NIST for testing, and many were modified or overhauled before being adopted by the military. NIST also produced the first quantitative data on the power-producing qualities of fuels and the first serious U.S. studies of the aerodynamics of flight.

A sound-ranging device developed by NIST was used toward the close of World War I to locate enemy artillery emplacements. The instrument timed the arrival of sound from each enemy firing at microphones placed along the Allied trench lines. An oscillogram found in 1962 at NIST’s former Washington, D.C., facility shows gunfire noise on Nov. 11, 1918, abruptly stopping as the Armistice went into effect at 11 a.m. It is the only known graphical record of the end of a war.

NIST CENTENNIAL

The National Institute of Standards and Technology’s 100th year of service to America began on March 3, 2001, and will culminate with our centennial anniversary one year later. For each month during this period, NIST Tech Beat will recall a significant event that occurred in the past century.
LIAISON NEWS

JOINT LOGISTICS COMMAND - CALIBRATION COORDINATION (JLC-CCG)
John Fishell, Liaison Delegate

New Navy Measurement Science Laboratory in Corona, CA.

The Navy officially began construction on Military Construction Project P-007 with a ceremony to mark the occasion. In attendance at this historic event were Congressman Ken Calvert (CA-43rd District) and RADM Michael G. Mathis, Commander, Naval Surface Warfare Center, who provided remarks on the history and significance of this project, and many local business and community leaders.

The new Measurement Science Laboratory, slated for completion in 2002, will be a 39,000 square foot, environmentally-controlled facility which will combine the laboratory operations currently being performed at three sites (Pomona, Seal Beach, and Corona). The Navy Special Interface Gage Laboratory and the Navy Metrology Research and Development Laboratory will all be housed in the new facility. The project will save the Navy the costs associated with maintaining their present 54,000 square feet of laboratory space by consolidating three sites into one and focusing on high-end measurements and leading-edge technologies. Measurements performed in this laboratory will be capable of meeting the tight accuracies required of today’s advanced weapon systems.

Joint Technical Coordinating Group for Calibration and Measurement Technology (JTCG-CMT).

The JTCG-CMT met during the Measurement Science Conference in Anaheim on 17 January, 2001. During the meeting, the group discussed the development of an Automated Calibration Procedures Subgroup, which would address automation issues within the Joint Service Metrology and Calibration community. While not yet formalized, the subgroup has already begun to coordinate various projects of mutual interest. Compatibility between DoD Automated Calibration systems is the defined goal of this effort.

**********

CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS (CEPM)
Norman B. Belcak, Liaison Delegate

The CEPM Executive Committee met on May 18, 2000, during CEPM 2000.

Several proposed amendments to the CEPM Charter were discussed:

The National Conference of Standards Laboratories had proposed an amendment to describe the arrangement under which the (now) NCASI Business Manager manages the CEPM Executive Committee Reserve Fund. The discussion resulted in some proposed wording changes in the amendment.

The Executive Committee concluded that the Charter permits Committee business to be conducted via post, and accordingly voted that the CPEM Chairman propose wording changes to the Charter to permit proposals to be made and discussed, and voted on via email.

A motion to expand the global representation on the Executive Committee by increasing the number of at-large members was passed. This requires a Charter change, which will be drafted by the Chairman in time for the next meeting.

A discussion of the Executive Committee donating funds to individual conferences to promote participation by metrologists of developing economies resulted in a direction to the Chairman to study the possible tax ramifications of such a move. In particular it was asked what ceiling exists for the fund to remain tax-free. This will be reported in the August 2001 meeting.

It was voted to extend the term of Juan Manuel Figueroa Estrada for six years, ending 2006.

CEPM '00

CEPM '00 was held in Sydney, NSW, Australia, May 14 - 19, 2000, in the Hilton Hotel. The conference was very well organized and a complete success - financially, technically, and socially. The registered attendance was 535, and 353 papers were presented, verbally and in poster format. Approximately $14k (US) was paid out by the conference in support of 13 Young Scientists from around the world.

CEPM '02

The next Conference on Precision Electromagnetic Measurements will be held in Ottawa, Ontario, Canada, from June 16 to June 21, 2002. The CEPM '02 is hosted by the Institute for National Measurement Standards (INMS) of the Canada National Research Council, and is chaired by Eddy So, 613-990-5806, <Eddy.So@nrc.ca>. The conference web site is <http://www.nrc.ca/confserv/cepm02/>.

**********

AMERICAN ASSOCIATION OF LABORATORY ACCREDITATION (A2LA)
Ramona J. Suar, Liaison Delegate

Status of Calibration Accreditation Program
As of April 25, 2001

# of accredited calibration labs: 222
# of applicant calibration labs seeking A2LA accreditation: 120

Status of Testing Laboratory Program

# of A2LA accredited testing laboratories: 1329
# of applicant testing labs seeking A2LA accreditation: 118

A2LA Holds Annual Assessor Conclave

More than 130 individuals from the A2LA assessor corps, Board of Directors, Criteria and Accreditation Councils participated in A2LA’s 2001 Assessor Conclave, which was held in Columbia,

To enable A2LA to satisfy the rapidly increasing demand for its accreditation services, a three-day assessor orientation course was held. More than twenty-five potential assessors and several staff members took the course. Attendees must pass an exam in order to be eligible for the next phase of assessor training.

Assessor uniformity and measurement uncertainty requirements for both testing and calibration laboratories were key topics discussed during technical advisory committee meetings and assessor breakout meetings held on April 21, 2001.

On Sunday, April 22, 2001, attendees participated in a review of key ISO/IEC 17025 requirements.

**Status of A2LA Transition to ISO/IEC 17025**

As of July 1, 2001 all new and renewal assessments will be performed to ISO/IEC 17025. A2LA will no longer be offering assessments or gap analyses to ISO/IEC Guide 25.

**A2LA EMC labs to be formally recognized by NIST**

The National Institute of Standards and Technology (NIST) has formally recognized A2LA as competent to accredit Electromagnetic Compatibility (EMC) testing laboratories for purposes of the United States- European Union Mutual Recognition Agreement (U.S.- E.U. MRA). As of March 5, 2001, NIST had designated 14 A2LA-accredited laboratories as Conformity Assessment Bodies (CABS) under the U.S.-E.U. MRA.

The European Commission has confirmed these designations and these laboratories are now authorized to provide documentation in support of U.S. manufacturers seeking to demonstrate compliance with European legal, regulatory and administrative requirements covered under the EMC Annex of the MRA.

NIST has also appointed A2LA as an authorized accreditation body under the provisions of Phase I of the Asia-Pacific Economic Cooperation (APEC) MRA for Conformity Assessment of Telecommunications Equipment. As a result, more than 40 A2LA-accredited testing laboratories are authorized to assess the conformance of telecommunications products to the legal, regulatory and administrative requirements of the APEC MRA as of March 5, 2001.

NIST’s recognition of A2LA is based on a memorandum of understanding (MOU) between NIST and the National Cooperation for Laboratory Accreditation (NACLA), and on A2LA’s status as a NACLA-recognized accreditation body and a signatory to the NACLA Mutual Recognition Arrangement. Under the MOU, the NACLA process of recognizing laboratory accreditation bodies was determined to be an acceptable alternative to direct NIST recognition under the National Voluntary Conformity Assessment Systems Evaluation (NVCASE) procedures.

********

**MEASUREMENT SCIENCE CONFERENCE (MSC)**

*Bob Johnson, Liaison Delegate*

The theme of the 2002 Measurement Science Conference is "Turning Measurement Science Information into Knowledge." The Conference will again be held at the Disneyland Hotel and Conference Center in Anaheim, Ca. the week of January 21-25, 2002.

The 2002 MSC Board members are:
- Doug Sugg - President / Conference Chairman
- John Bowman - Registration
- Rick Careyette - Scholarship & Education
- Alan Ho - Board Treasurer / Speakers
- Mark Kaufman - Exec VP & Operations
- Mike Magin - Board Chairman / Arrangements / Woodington Award
- John Schulz - Board Secretary / Publicity

The 2002 MSC Committee chairmen are:
- Cindy Becker - Marketing & Registration
- Debora DeDen - Marketing
- John Fishell - Speakers
- Bob Fritzsch - Programs & NIST Liaison
- Karen Jackson - Finance
- Robert Johnson - Conf Evaluation/Planning & NCSLI Liaison
- Mark Kashef - Tutorial Workshops
- Nidal Kerdia - Awards
- Rob Parchinski - Exhibits
- Muhamed Samman - Publications
- Rich Schumacher - Web Site Planner
- Jim Smith - Door Prizes & Exhibits
- Tuna Stevens - Arrangements
- Pamela Thomas - Guest Programs
- Ray Wade - Logistics
- Dewain Wilcox - Secretary

Two long time members of the MSC Board / Committee have retired.

Chet Crane’s involvement goes back to the first conference committee in 1975. Over the years, Chet served in numerous committee and board capacities including Conference Chairman for the 1984 Conference. That year the conference was held at the R.M.S. Queen Mary in Long Beach, Ca.

Dave Lorenzen began on the 1988 Conference committee. Dave served as the Conference Evaluator for five years and has served as the Tutorials chairman since then. We thank these gentlemen for their contributions over the years, and wish them well. Their stability and wisdom will be missed.

The 2002 program is coming together. Although the published date for submission of abstracts on the call for papers has passed, please contact Bob Fritzsch at (909) 273-5244 if you are interested in presenting.

Several tutorial workshops are being planned at this time, including: Pressure, Mass, Risk-Based Selection of Measuring and Test Equipment, Measurement Uncertainty, Choosing the Correct Measurement Tool, Laboratory Accreditation, and Anderson Loop. Please contact Mark Kashef at (310) 574-2027 for more information on these tutorial workshops.

For those of you that are planning on attending the upcoming NCSLI Symposium and Workshop in Washington, D.C., stop by the M.S.C. booth and say hello.

For more information, please visit the MSC website at <www.msc-conf.com>
INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY LIAISON REPORT
Dr. Charles Erhlich, Liaison Delegate

The Technical Standards Activities Program manages U.S. representation and participation in the International Organization of Legal Metrology (OIML), a treaty organization, on behalf of the U.S. State Department. OIML promotes global trade through harmonization of performance requirements for measuring instruments that are subject to laws or regulations. These instruments are used to promote equity in commerce, assure public and worker health and safety, and monitor environmental pollutants.

The NIST OIML webpage <http://ts.nist.gov/its/htdocs/210/215/oiml.htm> has recently been redesigned to indicate the technical committee structure of OIML, the International Documents and Recommendations under their purview, and who at NIST is responsible for the U.S. participation. The general OIML information webpage <http://www.oiml.org/> is maintained by the International Bureau of Legal Metrology (BIML).

OIML Presidential Council Meeting February 2001

C. Ehrlich, U.S. CIML member, attended OIML Presidential Council Meeting at the BIML in Paris. OIML participation now includes 109 countries of which 57 are full member states and the remaining 52 countries are classified as observers. The newest members are Malta, Cambodia and Gabon.

The Council revised its 1999 - 2002 Action Plan to refocus the organization’s resources on the highest-priority items which include:

- updating OIML publications that prescribe the process and procedures used by the organization’s technical committees in developing standards to enhance their efficiency and to ensure they are compatible with the procedures used by the International Organization for Standardization, the International Electrotechnical Commission and World Trade Organization.
- leveraging resources by improving cooperation between OIML and regional legal metrology organizations such as the Asia-Pacific Legal Metrology Forum and WELMEC (European Cooperation in Legal Metrology).
- identifying the economic impact of legal metrology in economies around the world to demonstrate the value of uniform legal metrology requirements so funding for metrological projects can be obtained from a variety of sources including the World Bank.

Another high-priority item discussed was the adoption of an International Document on Mutual Acceptance Arrangements (MAA). The MAA is being developed by the U.S. for use with the OIML Certificate System that involves the type approval of weighing and measuring devices. Speedy adoption of an MAA is important for U.S. manufacturers, as it will allow them to obtain type approval for their weighing instruments in one country and then have the test data accepted by other countries. This will permit manufacturers to more expeditiously place their instruments on market in less time and at significantly lower cost.

One of the last obstacles is to agree on an “accreditation” scheme that ensures the integrity of the test data but does not interfere with the autonomy of any laboratory or impose unreasonable costs on the issuing authorities or instrument manufacturers. After a long discussion, it appears that only accreditation or peer assessment is acceptable for judging the competence of test laboratories and issuing bodies. One proposal, that of allowing self-declaration of capabilities of laboratories, may be an option with peer assessment but it will not be the only option.

The Council also discussed inter-relations between the OIML and European standards bodies. The Council agreed that it was important to ensure that the upcoming European Directive on Measuring Instruments (MID) will allow European countries to fulfill their obligations as members of both OIML and the World Trade Organization (WTO). It also agreed that it is also appropriate to ensure good technical relations between the OIML and the European Committee for Electrotechnical Standardization (CENELEC) and European Committee for Standardization (CEN).

CENELEC/CEN are considered regional legal metrology standardizing bodies owing to the possibility that the European Commission may utilize them to implement the MID. However, the Council concluded that cooperation between the OIML and European bodies shall not be detrimental to its cooperation with other regions and shall not create additional burden or costs to be born by the OIML Member States. In this connection, the Council concluded that the development of European “normative documents” based on existing OIML Recommendations to give presumption of conformity to the MID requirements will not be the responsibility of the BIML.

The Council agreed that OIML would sponsor a workshop on the future of legal metrology that will be held in Europe in 2002. The purpose of the workshop is to evaluate the possible developments of legal metrology during the next twenty years. This workshop will bring together experts from national legal metrology services, representatives of regional legal metrology organizations, manufacturers and users of measuring instruments, and consumer associations. This way, the participants can gain insight into upcoming changes in technology, the legal environment and the marketplace that will impact legal metrology over the next two decades. One important topic will be marketplace surveillance, since there may be a universal need for legal metrology officials to focus less on type evaluation and more on verification and supervision of measuring instruments in actual use.

In fulfilling its role as U.S. Secretariat for a number of OIML Technical Committees, NIST distributed the following publications to national and international working groups and/or technical committees or CIML for review and/or adoption:

- 2nd working draft revision of OIML Recommendation R 33 “Conventional Mass”
- 2nd working draft revision of OIML Recommendation R 74 “Electronic Weighing Instruments”
- 1st working draft revision of OIML Document D-1 “Law on Legal Metrology.” This document is based on review of laws and model legislation from the U.S., Canada, Australia, and Russia and it includes principles addressed in proposed revision of D 1 prepared by the Director-elect of BIML.
- Draft Recommendation on “Liquid-in-Thermometry” that was approved by OIML TC 11/SC.2 “Contact Thermometry” and was then submitted to the Committee on International Legal Metrology (CIML) for adoption.
- 1st committee draft of a new OIML Recommendation “FTR Spectrometer Systems For Measurement Of Air Pollutants”
• 1st draft revision of OIML Recommendation R 82 “Gas Chromatographic Systems for Measuring Pesticides and Other Toxic Substances.”

For any further information please contact:

Dr. Ambler Thompson, NIST, Technical Standards Activities Program, 301-975-2333, <ambler@nist.gov>.

********

AMERICAN SOCIETY FOR QUALITY
Chris Grachanen, Liaison Delegate

Certified Calibration Technician (CCT) Program Update

The CCT program is progressing right on schedule per its carefully laid out “Roadmap to Success”. As of this writing, the CCT committee has assembled twelve subject matter experts (SMEs) for participation in a phone survey and another twelve SMEs for participation in a workshop slated for August 2nd and 3rd in Washington D.C., immediately following the NCSLI International Conference. The assembled SMEs include representatives from all four department of defense (DOD) agencies, academia, consulting firms and public/private providers of calibration services.

The phone interviews currently being conducted (May - June) have been carefully scripted in order to obtain as much pertinent information as possible within a 20-30 minute span. Script questions have been formulated to address topics relative to:

• Education
• Training
• Experience
• Roles and Responsibilities
• Proficiency testing
• Generalist versus discipline-specific issues
• Certification

To help inform the general public about the CCT program, a certification information session is scheduled for the 2001 Measurement Quality Conference (see below).

2001 Measurement Quality Conference
National Institute of Standards & Technology
Gathersburg, MD
September 13 - 14, 2001

The 2001 Measurement Quality Conference, co-sponsored by the Measurement Quality Division (MQD) of the American Society for Quality and the Electricity Division of the National Institute of Standards and Technology (NIST), will be held Thursday and Friday, September 13 and 14, in the NIST Green Auditorium. Registration details will be posted on the MQD web site <http://www.metrology.org> beginning June 15.

********

GIDEP METROLOGY
Jim Carlton, Liaison Delegate

GIDEP Metrology Data DVD & CD-ROMs

The GIDEP Metrology database is now on a single search engine and all of the data is on DVD_0001, and PDF_0004 through PDF_0008. The entire metrology DVD and CD set contain metrology data submitted to GIDEP from 1 October 1993 through 28 April 2000. There are about 486 subscribers to the GIDEP DVD & CDs.

GIDEP software engineering is working on a new search engine that will allow the DVD & CDs to work in a network environment in addition to the local computer.

GIDEP is developing a Technical Manual (Equipment Operating and Maintenance Manuals) DVD/CD set that will contain all the “.pdf” format, GIDEP database technical manuals. The main thrust of this effort has come as a result of the Air Force Metrology Center submitting over 2500 electronic (digitized) technical manuals to GIDEP.

Processing these documents into the GIDEP database is nearly complete. As each document is processed, it is available to all GIDEP participants from the GIDEP database website (you don’t have to wait for the DVD/CDs to obtain the documents). The Technical Manual DVD/CDs should be available by October 2001.

38th GIDEP Workshop and Information Sharing Conference

The 38th GIDEP Workshop and Information Sharing Conference was held on May 7-10, 2001 at the Westin Crown Center in Kansas City, MO. The conference was a success with over 160 attendees. Among the many excellent and informative speakers were RADM Gwilym H. Jenkins (Deputy for Acquisition and Business Management ASN (RDA) Materiel Acquisition Support and Information System (MASIS)), Patricia A. Himneburg (Boeing EAC, Director, Support), and Dr. Nancy Dixon (author of “Common Knowledge”).

Metrology Data Award Winners

Each year the top metrology data submitters for government and industry are recognized at the GIDEP Workshop. The top submitters this year are as follows:

Government: Army TMDE Activity, Redstone Arsenal, Alabama
GIDEP Representative: Tim Greenlee

Industry: Rockwell Collins, Cedar Rapids, Iowa
GIDEP Representative: Robert Warnock

Laboratory Accreditation Bureau

Jim Carlton attended the Laboratory Accreditation Bureau assessor-training program on May 16, 2001, in Phoenix, Arizona. The training focused on uniformity of approach to assessments, how to assess the validity of the Best Measurement Capability reported by the lab, policy on Proficiency Testing (PT), how to evaluate the PT results, and field service requirements.

 Calibration/Certification Procedure Committee

GIDEP will be participating in the Calibration/Certification Procedure Committee at the upcoming NCSLI conference in Washington DC. GIDEP has created the electronic version of RP-3 (Recommended Practice for developing calibration procedures) that will be reviewed by team members at the Conference in July.
# NEW NCSL MEMBERS

## REGION 1
C.S.C. Force Measurement, Inc.  
Agawam, MA 01001  
Member Delegate:  
John Glynn  
(413) 789-3086  
Dow Chemical Co.  
Smithfield, RI 02917  
Member Delegate:  
Paul Dibara  
(401) 233-1249  
Masy Systems, Inc.  
Pepperell, MA 01463  
Member Delegate:  
Kirk Nolte  
(978) 433-6279  
Vaisala, Inc.  
Woburn, MA 01801  
Member Delegate:  
Jim Tennermann  
(781) 933-4500 x330  
Yankee Controller Service  
Rockland, MA 02370  
Member Delegate:  
Richard Rothstein  
(781) 982-7125

## REGION 2
ACTI Calibration Services  
Lakewood, NJ 08701  
Member Delegate:  
James Flagg  
(732) 367-6077  
Underwriters Laboratories, Inc.  
Melville, NY 11747-3061  
Member Delegate:  
Don Champlin  
(631) 271-6200

## REGION 3
Bespak, Inc.  
Apex, NC 27502  
Member Delegate:  
C.C. Cockham, Jr.  
(919) 303-4106

## REGION 4
ElecServices, Inc. Calibration & Repair  
Millers Falls, MA 01343  
Member Delegate:  
Robert Blanco  
(305) 828-3314  
PreciseCal Services, Inc.  
Clearwater, FL 33762  
Member Delegate:  
Kevin Torres  
(727) 572-4225

## REGION 5
Calibration Technologies, Inc.  
Louisville, KY 40223  
Member Delegate:  
Tod Stevenson  
(502) 244-8014  
Giatech, Inc.  
Beachwood, OH 44122  
Member Delegate:  
Pamela Sworan  
(216) 831-3200  
Radion Research, Inc.  
Lafayette, IN 47905  
Member Delegate:  
Tim Everidge  
(765) 447-0535 x518  
Russ Lillie Electric  
Coopersville, MI 49404  
Member Delegate:  
Russ Lillie  
(616) 837-5109  
TI Automotive Limited  
Caro, MI 48723  
Member Delegate:  
Doug Dehmeli  
(810) 672-1200 x2236

## REGION 6
Entergy Operations, Inc.  
St. Francisville, LA 70775  
Member Delegate:  
Thomas Griffiths  
(225) 361-4611

## REGION 7
Berlex Biosciences  
Richmond, VA 23230  
Member Delegate:  
Lorene Williamson  
(510) 669-4542  
Jaeger Enterprises  
Saratoga, CA 95070-4918  
Member Delegate:  
Klaus Jaeger  
(408) 867-1743

## REGION 8
Amphastar Pharmaceuticals, Inc.  
Rancho Cucamonga, CA 91730  
Member Delegate:  
Rudy Hidalgo  
(909) 980-9484 x2109  
Cal-Labs  
La Mirada, CA 90638  
Member Delegate:  
Michelle Brophy  
(562) 921-8433  
Prime Machine  
Salt Lake City, UT 84101  
Member Delegate:  
Jay Soelberg  
(801) 575-8430

## REGION 9
ICOS Corporation  
Bothell, WA 98021  
Member Delegate:  
Pete Zampardi  
(425) 415-5580  
Medtronic Physio-Control  
Redmond, WA 98073-9706  
Member Delegate:  
Lee Miller  
(425) 867-4694

## REGION 10
INMETRO  
Rio de Janeiro, 20261-232 Brazil  
Member Delegate:  
Joao Alzirio Herz da Jornada  
011-55-21-563-2905  
Israel Laboratory Accreditation Authority  
Ramat-Gan 52522, Israel  
Member Delegate:  
Orna Dreissen  
011-972-3-575-1690  
Nokia Mobile Phones  
Tampere 33721, Finland  
Member Delegate:  
Kari Kortesoina  
011-358-50-505-6955  
Petaling Jaya, Selangor 47600, Malaysia  
Member Delegate:  
Abdul Jalil Baharuddin  
011-603-56329066 x202  
Sumitomo 3M Ltd.  
Sagamihara, Kanagawa 229-1185, Japan  
Member Delegate:  
Shigeo Tomikawa  
011-81-42-779-2202

## REGION 12
Air Canada  
Dorval, PQ H4Y 1C2 Canada  
Member Delegate:  
Mark Wareham  
(514) 422-6134  
LPP Manufacturing, Inc.  
Guelph, ON N1H 1E5 Canada  
Member Delegate:  
Rob Statt  
(519) 837-3055  
Rohde & Schwarz Canada, Inc.  
Ottawa, ON K2K 2M5 Canada  
Member Delegate:  
Steve McFarlane  
(613) 592-5000 x231
200 VP - NORTHEAST DIVISION (Regions 1, 2, & 5)
Jeff Gust
Verizon Logistics
Electronic Repair Service
3301 Wayne Trace
Fl. Wayne, IN 46805
(219) 428-6504 FAX(219) 424-1031
e-mail: jeff.gust@verizon.com

500 VP - SOUTHEAST DIVISION (Regions 3 & 4)
Edward Fritchard
BWXT Y-12, LLC
Oak Ridge Metrology Center
P.O. Box 2009
Oak Ridge, TN 37831-6041
(865) 574-4261 FAX(865) 574-2802
 e-mail: peichertewe@y12.doe.gov

300 VP - CENTRAL DIVISION (Regions 6 & 11)
Carol Hockert
State of Minnesota
Weights & Measures Div.
2277 Highway 36
Roseville, MN 55113
(651) 628-6851 FAX(651) 639-4014
e-mail: carol.hockert@state.mn.us

400 VP - WESTERN DIVISION (Regions 7, 8, & 9)
Harry Moody
Bechtel BWXT Idaho
Idaho Nall. Eng. & Env. Lab
P.O. Box 1625
Idaho Falls, ID 83415-4137
(208) 526-2655 FAX(208) 526-5462
e-mail: moodhj@inel.gov

1000 VP - INTERNATIONAL (Regions 10, 12 & 13)
En Nemeroff
EN Industries
3744 D SW Quail Meadow Trail
Palm City, FL 34990
(561) 267-3547 FAX(561) 267-3547
e-mail: EnNemeroff@cs.com

NCSL INTERNATIONAL COMMITTEE CHAIRS 2001

21 ADMINISTRATIVE GUIDELINES & BYLAWS
Klaus Jaeger
Jaeger Enterprise
13655 Calle Tacuba
Saracoga, CA 95070-4918
(408) 741-0620 FAX(408) 867-3705
e-mail: jaegerenterprise@home.com

120 VP - OPERATIONS & MARKETING
P.W. “Woody” Tramel

121 NCSL INTERNATIONAL BUSINESS MANAGER
Craig Gulka
NCSL International
1800 30th St, Suite 305B
Boulder, CO 80301-1026
(303) 440-3339 FAX (303) 440-3384
e-mail: cgulka@ncslisternational.org

122 PUBLICITY
James Tavernier
Software Analysis
55 Eauke St.
Pasadena, CA 91103
(626) 685-4759 FAX(626) 685-2095
e-mail: jmtnv@yahoo.com

123 HONORS & AWARDS
Hung Roston
Rockwell Collins
Bldg. 311-100
1100 W. Hibiscus Blvd.
Melbourne, FL 32901
(407) 756-7171 FAX(407) 766-7231
e-mail: hroston@collins.rockwell.com

124 MULTIMEDIA RESOURCES
John Grijera
Lockheed Martin Technical Operations
Bldg. 195A, O/43-91
P.O. Box 3504
Sunrayvalle, CA 94086-3504
(650) 742-2864 FAX(650) 742-4435
e-mail: johngrijera@lmco.com

125 MEMBERSHIP
Larry Yates
Nortox Software
1164 Conservancy Dr. West
Tallahassee, FL 32312
(850) 907-3425 FAX(850) 907-3425
e-mail: lyates@ntox.com

126 ANSI SECRETARIAT
Craig Gulka
NCSL International
1800 30th St, Suite 305B
Boulder, CO 80301-1026
(303) 440-3339 FAX(303) 440-3384
e-mail: cgulka@ncslisternational.org

130 VP - STANDARDS POLICY
Anthony Anderson

131 U.S. GOVERNMENT AFFAIRS
Mike Suraci
Lockheed Martin
NSB Bangor
P.O. Box 6429
Silverdale, WA 98385-6429
(360) 396-8535 FAX(360) 396-6737
e-mail: mike.suraci@lmco.com

140 VP - MEAS. SCIENCE & TECHNOLOGY
Richard Pettit

141 AUTOMATIC TEST & CALIBRATION SYSTEMS
Scott Sowerby
Verizon Logistics
3301 Wayne Trace
Fort Wayne, IN 46806
(219) 425-9909 FAX(219) 425-9124
e-mail: scott.sowerby@verizon.com

142 MEASUREMENT COMPARISON PROGRAMS
James C. Wheeler
Navy Primary Standards Lab
Code 4144, Bldg. 499
NADEP North Island
San Diego, CA 92135-7050
(619) 545-9568 FAX(619) 545-9661
e-mail: wheelerjc@naval.navy.mil
NCSL INTERNATIONAL COMMITTEE CHAIRS (Cont’d)

163 PERSONNEL TRAINING REQUIREMENTS

Hong Rosson
Rockwell Collins
Bldg. 311-100
1100 W. Hibiscus Blvd.
Melbourne, FL 32901
(407) 788-7171 FAX(407) 788-7231
e-mail: hrrosson@collins.rockwell.com

164 EDUCATION SYSTEM LIAISON

Terrelle J. Wilson
12016 W. Temple Dr.
Morrison, CO 80465
(303) 904-6121
e-mail: terrellew@qwes.net

170 VP - DOCUMENTARY STDS. APPLICATIONS

John Wehrmeyer

171 LABORATORY EVALUATION RESOURCES

David Dlkken
MTL Corp.
10824 Normandale Blvd.
Minneapolis, MN 55437
(612) 928-0672 FAX: (612) 881-2236
e-mail: ddilkken@mtlcorp.com

172 LABORATORY FACILITIES

Dr. David Braudaway (Co-Chair)
103 Ranch Rd.
P.O. Box 9
Sandia Park, NM 87047-0009
(505) 281-3691 FAX: same (call first)
e-mail: dwbraudaway@worldnet.att.net

Doug Cooper (Co-Chair)
Control Solutions
1770 Mission Morrow Rd.
Lebanon, OH 45036
(513) 398-9800 FAX: (513) 398-9048
e-mail: dcooper@controlsolutions.com

173 METROLOGY PRACTICES

Howard Caslrup
Integrated Sciences Group
14608 Casitas Canyon Rd.
Bakersfield, CA 93386
(805) 872-1683 FAX: (805) 872-3669
e-mail: hcaslrup@isgmax.com

174 ANSI/NCSL WRITING COMMITTEE

Jesse Morse
Fluke Corporation
MS: 239-E
P.O. Box 9060
Everett, WA 98206
(425) 458-5488 FAX: (425) 356-5102
e-mail: jmorse@tc.fluke.com

175 ACCREDITATION RESOURCES

Larry E. Nielsen
Southern California Edison
7300 Kemper Ln.
Westminster, CA 92683
(714) 895-0499 FAX: (714) 895-0686
e-mail: nlneilse@sce.com

180 VP - PUBLICATIONS

Georgia Harris

181 OVERSIGHT

Dr. Stuart Kupferman
Sandia National Laboratories
Div. 1542
P.O. Box 5800
Albuquerque, NM 87185-0665
(505) 844-6249 FAX: (505) 844-6472
e-mail: skupfer@sandia.gov

182 GLOSSARY

Bob Hardy
RH Systems
2615 P Ave American Fwy NE
Albuquerque, NM 87107
(505) 344-6400 FAX: (505) 344-6409
e-mail: bch@rhysystems.net

183 ARCHIVAL

Lewis A. Feng
Lockheed Martin Tech. Oprs.,
Org. 43-91, Bldg. 195A
P.O. Box 61687
Sunnyvale, CA 94088
(408) 756-3534 FAX: (408) 742-4435
e-mail: lewis.feng@lmco.com

185 CALIBRATION/CERTIFICATION PROCEDURES

Dale E. Varnet
Lockheed Martin Space Systems
MS: P9682
P.O. Box 179
Denver, CO 80201
(303) 977-5523 FAX: (303) 971-5635
e-mail: dale.varnet@lmco.com

186 NEWSLETTER

John Minck
942 Towle Pl.
Palo Alto, CA 94306-2333
(650) 493-3956 FAX: (650) 493-3955
e-mail: john_minck@noma-am.exch.agilent.com

190 VP - CONFERENCE MANAGEMENT

J. Michael Suraci

191 SITE SELECTION

Bill Simmons
Wyle Laboratories
3200 Magruder Blvd.
Hampton, VA 23666-1498
(757) 865-0000 x451 FAX: (757) 865-0085
e-mail: bsimmons@hmp.wylelabs.com

192 WORKSHOP & SYMPOSIUM STAFF

2001 DIRECTOR

Ramona Saar
American Association for Laboratory Accreditation
5301 Brooksbytown Pike, Suite 350
Frederick, MD 21704
(301) 644-3201 FAX: (301) 652-2974
e-mail: rsaar@a2la.org

2002 DIRECTOR

Mike Magin
Cutler Hammer Eng. Services
Suite A
9810 Ridgehaven Ct.
San Diego, CA 92123
(516) 514-2412 FAX: (516) 514-2410
e-mail: dave.magin@eaton.com

2003 DIRECTOR

TBD
### NCSL INTERNATIONAL REGION COORDINATORS 2001

**REGION 1 (210)**
Steve Griffin  
Fluke Corporation  
78 Margery Lane  
Westwood, MA 02090  
(781) 762-8921 FAX (781) 255-6641  
e-mail: sgriffin@pc.fluke.com

**REGION 2 (220)**
Joe Reinstein  
Simco Electronics  
2125 SW 28th St.  
Allentown, PA 18103  
(610) 798-0100 x28 FAX (610) 798-7710  
e-mail: jreinstein@simco.com

**REGION 2 New York City Section (221)**
Don Bansen  
Dayton T. Brown, Inc.  
Calibration Lab, Dept. 14  
555 Church St.  
Bohemia, NY 11716-5301  
(631) 589-6300 x723 FAX (631) 587-9045  
e-mail: dbansen@daytonbrown.com

**REGION 2 Upstate New York Section (222)**
Jeff Willey  
Measurements International  
812 Proctor Ave.  
Ogdensburg, NY 13669  
(315) 324-4588 FAX (613) 925-1195  
e-mail: mwilley@msiintl.com

**REGION 2 Philadelphia Section (223)**
Joe Reinstein  
Simco Electronics  
2125 SW 28th St.  
Allentown, PA 18103  
(610) 796-0100 x28 FAX (610) 798-7710  
e-mail: jreinstein@simco.com

**REGION 2 Pittsburgh Section (224)**
Karl Kleven  
Process Instruments  
615 E. Carson St.  
Pittsburgh, PA 15223  
(412) 421-4800 FAX (412) 431-3792  
e-mail: kklevens@callab.net

**REGION 3 (530)**
Kevin Abercrombie  
Navy, Dept. of  
RDTNE Lab, Bldg. 1403, NAWCAD, Unit 7  
22113 Fortin Circle  
Patuxent River, MD 20670-1118  
(301) 342-1654 FAX (301) 342-0920  
e-mail: abercrombie@naval.navy.mil

**REGION 3 Maryland Section (531)**
Ramona Saar  
American Association for  
Laboratory Accreditation  
5301 Buckeystown Pike, Suite 350  
Frederick, MD 21704  
(301) 644-5201 FAX (301) 662-2974  
e-mail: rsaar@aalab.org

**REGION 3 North Carolina Section (532)**
Charles J. Lord  
Glaxo Welcoome  
Tech. Services & Instrumentation  
P.O. Box 13398  
Res. Triangle Park, NC 27709  
(919) 483-5525 FAX (919) 315-5799  
e-mail: cj.lord@ieee.org

**REGION 3 Virginia Section (533)**
TBD

**REGION 4 (540)**
Jack Shuler  
Scientific Atlanta  
4245 International Blvd.  
Norcross, GA 30093  
(770) 903-5319 FAX (770) 903-2143  
e-mail: jack.shuler@scatl.com

**REGION 4 Atlanta Section (541)**
Dennis Fuller  
Electro Rent Corp.  
3500 Corporate Way  
Duluth, GA 30096  
(770) 913-6956 FAX (770) 913-6970  
e-mail: dfuller@elecrorent.com

**REGION 4 Central Florida Section (542)**
Ray Minchin  
Lockheed Martin Information Systems  
MP 829 12506 Lake Underhill Rd.  
Orlando, FL 32825-5002  
(407) 306-2269 FAX (407) 306-2271  
e-mail: raymond.l.minchin@lmco.com

**REGION 4 Huntsville Section (543)**
Greg St. Charles  
Boeing Huntsville  
MS: JY-66  
P.O. Box 240002  
Huntsville, AL 35824  
(256) 772-2824  
e-mail: gregory.stcharles@hsv.boeing.com

**REGION 4 Tennessee Section (544)**
TBD

**REGION 4 Puerto Rico Section (545)**
Angel Pabellon  
Advanced Instruments  
P.O. Box 29502  
San Juan, PR 00929  
(787) 752-1133 FAX (787) 762-1833  
e-mail: cmc@advpr.com

**REGION 5 (250)**
Lloyd Baker  
Vision Automotive Systems  
Global Tech. Ctr., Rawsonville Plant  
McKean & Textile Rds.  
Ypsilanti, MI 48197  
(734) 484-8738 FAX (734) 484-9085  
e-mail: lbaker4@vision.com

**REGION 5 Northern Ohio Section (251)**
James A. Crane  
Keithley Instruments, Inc.  
28775 Aurora Rd.  
Cleveland, OH 44139-1891  
(440) 498-2904 FAX (440) 248-6168  
e-mail: jcrane@keithley.com
### Region 5
#### S. Ohio/Kentucky Section (252)
- Charlie Mays  
  Wykle Laboratories  
  813 Irving-Wick Dr. West  
  Heath, OH 43056-6118  
  (740) 788-5412 FAX(740) 788-5404  
  e-mail: mays@wyklemail.afmetcai.af.mil

#### Central Indiana Section (253)
- Jim McWilliams  
  PTS Calibrations, LLC  
  5603 W. Ray mond St., Suite 1  
  Indianapolis, IN 46241  
  (317) 487-2378 FAX(317) 487-2375  
  e-mail: jmccwilliams@ptscai.com

#### Northern Indiana Section (254)
- TBD

#### Michigan Section (255)
- Lonnie Spire  
  Dynamic Technology, Inc.  
  1200 N. Old US-23  
  Hartland, MI 48353-0589  
  (810) 225-4601 FAX(810) 225-4602  
  e-mail: lspire@dynamictechnology.com

### Region 6
#### Central Texas Section (311)
- Allen Todd  
  Fluke Corporation  
  2104 Hulton Dr., Suite 112  
  Carrollton, TX 75006  
  (972) 405-1000 FAX(972) 247-5642  
  e-mail: allen.todd@fluke.com

#### South Texas Section (312)
- Keith Stoggs  
  South Texas Procoot Nuclear Operating Co.  
  MS: L-1001, Metrol. & Reliab.  
  P.O. Box 269  
  Wadsworth, TX 77414  
  (281) 972-7742 FAX(281) 972-8368  
  e-mail: dagoo@masstrat.net

#### Boulder/Denver Section (313)
- Greg Burnett  
  Agilent Technologies  
  MS: 2.06A  
  9780 S. Meridian Blvd.  
  Englewood, CO 80112  
  (303) 662-4250 FAX(303) 662-3673  
  e-mail: greg.burnett@agilent.com

#### Albuquerque Section (314)
- Michele Monsam  
  Intel Corporation  
  4100 Sera Rd. SE  
  Rio Rancho, NM 87124  
  (505) 794-0545 FAX(505) 893-0440  
  e-mail: Michele.R.Monsam@intel.com

### Region 7
#### LA/Valley Section (421)
- Miguel Cerezo  
  Amgen, Inc.  
  MS: 21-2-C  
  1 Amgen Center  
  Thousand Oaks, CA 91320-1799  
  (805) 447-1126 FAX(805) 499-8733  
  e-mail: mcerezo@amgen.com

#### LA/Orange Co. Section (422)
- James E. Smith  
  The Boeing Company (TEMC)  
  MS: H021-F144 Attn: Jim  
  3301 Bohus Ave.  
  Huntington Beach, CA 92647-2099  
  (714) 896-1670 FAX(714) 896-5534  
  e-mail: james.smith5@west.boeing.com

#### San Diego Section (423)
- Kevin Davis  
  Solar Turbines, Inc. (A Caterpillar Company)  
  9330 Sky Park Cir.  
  San Diego, CA 92123-5398  
  (619) 694-6181 FAX(619) 694-6287  
  e-mail: cjavin_kevin_c@solarturbines.com

#### Phoenix-Tucson Section (424)
- Chris Durkin  
  Roaming Buffalo Test & Calibration Outfitters  
  6645 W. Kings Ave.  
  Glendale, AZ 85306-1615  
  (602) 678-1639 FAX(602) 878-6872  
  e-mail: durkin@roamingbuffalo.com

#### Utah Section (425)
- Bernard Morns  
  Hart Scientific, Inc.  
  799 E. Utah Valley Dr.  
  American Fork, UT 84003-9775  
  (801) 763-1000 FAX(801) 763-1010  
  e-mail: bermorns@hartscientific.com

### Region 8
#### Gulf Coast Section (315)
- Allen Bare  
  GB Tech  
  Metrology Engineering  
  Standards & Calibration Labs  
  Sterretes Space Center, MS 35929  
  (220) 688-6444 FAX(220) 688-3079  
  e-mail: allen.bare@ssc.nasa.gov

#### LA/Raytheon Systems Company  
Bldg 111  
P.O. Box 11337  
Tuscon, AZ 85734  
(520) 794-4443 FAX(520) 794-5658  
e-mail: webenda@west.raytheon.com

#### Boise/Denver Section (430)
- Derek J. Porter  
  Boeing Commercial Airplane Group  
  MS: 19-MC  
  P.O. Box 3707  
  Seattle, WA 98124  
  (206) 655-6258 FAX(206) 655-4404  
  e-mail: derek.porter@pss.boeing.com

### Region 9
- TBD
<table>
<thead>
<tr>
<th>REGION 10 INTERNATIONAL REGION (1000)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REGION 10 Mexico (1011)</strong></td>
</tr>
<tr>
<td>Roberto Bernalz</td>
</tr>
<tr>
<td>Metroca, S.A. de C.V.</td>
</tr>
<tr>
<td>Alfonso Reyes 52620</td>
</tr>
<tr>
<td>Monterrey, NL 64200 Mexico</td>
</tr>
<tr>
<td>011-52-83-702600 FAX:011-52-81-294644</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:robertob@metroca.com.mx">robertob@metroca.com.mx</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 Great Britain (1012)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jerry Benson</td>
</tr>
<tr>
<td>National Physical Laboratory</td>
</tr>
<tr>
<td>Queens Road</td>
</tr>
<tr>
<td>Teddington, Middlesex TW11 0U England</td>
</tr>
<tr>
<td>011-44-20-8943-8824 FAX:011-44-20-8943-7099</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:jerry.benson@npl.co.uk">jerry.benson@npl.co.uk</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 Taiwan (1014)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigel Jou</td>
</tr>
<tr>
<td>Center for Meas. Sds TTRI</td>
</tr>
<tr>
<td>321, Sec. 2, Kang Fu Rd.</td>
</tr>
<tr>
<td>Hsinchu, TAiwan 30062 R O.C.</td>
</tr>
<tr>
<td>011-886-35-721321 FAX:011-886-35-716231</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:kaz.hayakawa@fluke.com">kaz.hayakawa@fluke.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 Japan (1015)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kazumi Hayakawa</td>
</tr>
<tr>
<td>K.K. Fluke</td>
</tr>
<tr>
<td>Izumi Shiba Daimon Bldg.</td>
</tr>
<tr>
<td>2-2-11 Shiba Daimon, Minato-ku</td>
</tr>
<tr>
<td>Tokyo, 105-0012 Japan</td>
</tr>
<tr>
<td>011-81-3-3434-0191 FAX:011-81-3-3434-0170</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:kaz.hayakawa@fluke.com">kaz.hayakawa@fluke.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 Nordic (1017)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kurt Jensen</td>
</tr>
<tr>
<td>Agilent Technologies A/S</td>
</tr>
<tr>
<td>Kongvej 25</td>
</tr>
<tr>
<td>3469 Bihausen, Denmark</td>
</tr>
<tr>
<td>011-45-4599-1275 FAX:011-45-4582-0630</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:kurt.jensen@agilent.com">kurt.jensen@agilent.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 France (1018)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jean Claude Krynicki</td>
</tr>
<tr>
<td>Agilent Technologies France</td>
</tr>
<tr>
<td>11 rue Ambroise Croizat</td>
</tr>
<tr>
<td>ZAE Les Glaciers</td>
</tr>
<tr>
<td>Palaiseau, 91473 France</td>
</tr>
<tr>
<td>011-33-1-64-53-5367 FAX:011-33-1-64-53-5618</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:jean-claude_krynicki@agilent.com">jean-claude_krynicki@agilent.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 Netherlands (1020)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. T.M Plantenga</td>
</tr>
<tr>
<td>Neth. Von Swiden Laboratorium B.V</td>
</tr>
<tr>
<td>Schoenmakerstraat 97</td>
</tr>
<tr>
<td>P.O. Box 654</td>
</tr>
<tr>
<td>2600 AR Delft, The Netherlands</td>
</tr>
<tr>
<td>e-mail:<a href="mailto:ampie@nl.nl">ampie@nl.nl</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 Egypt (1021)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Prof. Dr. Ahmed A. El Sayed</td>
</tr>
<tr>
<td>Natl. Laboratory Accreditation Bureau</td>
</tr>
<tr>
<td>National Institute for Standards</td>
</tr>
<tr>
<td>Tersa St., El Haram, Giza 12211</td>
</tr>
<tr>
<td>Egypt</td>
</tr>
<tr>
<td>011-20-2-3879243 FAX:011-20-2-3829446</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:AhmedAEl@nlab.nk.sci.eg">AhmedAEl@nlab.nk.sci.eg</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 China (1022)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Xunsheng Li</td>
</tr>
<tr>
<td>Waveitech China</td>
</tr>
<tr>
<td>Precision Measurement, Room 2701B</td>
</tr>
<tr>
<td>CITC Bldg. 19 Jiangguomenval Dajie</td>
</tr>
<tr>
<td>Beijing, 100000 China</td>
</tr>
<tr>
<td>011-86-10-6592804 FAX:011-86-10-65008199</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:xunshengli@yahoo.com">xunshengli@yahoo.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 Great Britain (1012)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Maurice Nogueira Frota</td>
</tr>
<tr>
<td>Sociedade Brasileira de Metrologia</td>
</tr>
<tr>
<td>Av. Beira Mar, 262/5 Andar Castelo</td>
</tr>
<tr>
<td>Rio de Janeiro, RJ 20021-060 Brazil</td>
</tr>
<tr>
<td>011-52-7-544-5571 FAX:011-52-7-544-5527</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:mfrota@mec.puc-rio.br">mfrota@mec.puc-rio.br</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 Turkey (1026)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Huseyin Ugur</td>
</tr>
<tr>
<td>National Metrology Institute</td>
</tr>
<tr>
<td>PK 21</td>
</tr>
<tr>
<td>41470 Gebze, Kocaeli, Turkey</td>
</tr>
<tr>
<td>011-90-262-643-6093 FAX:011-90-262-643-6002</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:ugurh@ume.tubitak.gov.tr">ugurh@ume.tubitak.gov.tr</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 10 South Africa (1027)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Francois Denner</td>
</tr>
<tr>
<td>CSIR - National Metrology Laboratory</td>
</tr>
<tr>
<td>P.O. Box 395</td>
</tr>
<tr>
<td>Pretoria 0001</td>
</tr>
<tr>
<td>South Africa</td>
</tr>
<tr>
<td>011-27-12-641-3139 FAX:011-27-12-641-3362</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:bfdemmer@csir.co.za">bfdemmer@csir.co.za</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 11 (320)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Herb O'Neill</td>
</tr>
<tr>
<td>Ridgewater College</td>
</tr>
<tr>
<td>2 Century Ave.</td>
</tr>
<tr>
<td>Hutchinson, MN 55350</td>
</tr>
<tr>
<td>(320) 587-3836 x274</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:herbo@ridgewater.mnsca.edu">herbo@ridgewater.mnsca.edu</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 11 Twin Cities Section (321)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Terry Conder</td>
</tr>
<tr>
<td>3M Metrology Lab</td>
</tr>
<tr>
<td>3M Center Bldg. 205-1-01</td>
</tr>
<tr>
<td>St. Paul, MN 55144-1000</td>
</tr>
<tr>
<td>(651) 736-4331 FAX(651) 736-7335</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:tmconder@mmm.com">tmconder@mmm.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>REGION 11 Chicago Section (322)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tom Wallrich</td>
</tr>
<tr>
<td>Bayer Healthcare Corp.</td>
</tr>
<tr>
<td>Route 120 &amp; Wilson Rd.</td>
</tr>
<tr>
<td>Round Lake, IL 60073-0490</td>
</tr>
<tr>
<td>(847) 270-2600 FAX(847) 270-5595</td>
</tr>
<tr>
<td>e-mail: <a href="mailto:thomew_wallrich@bayer.com">thomew_wallrich@bayer.com</a></td>
</tr>
</tbody>
</table>
NCSL INTERNATIONAL REGIONAL COORDINATORS (Cont’d)

REGION 11 Kansas City Section (324)
Roger Burton
Honeywell FM&T
E14 BR28
P.O. Box 419159
Kansas City, MO 64141-6159
(816) 997-5431 FAX(816) 997-5480
e-mail: rburton@kcp.com

REGION 11 Central Illinois Section (325)

REGION 11 Rockford Illinois Section (326)
Gordon Skuttum
Rock Valley College
3001 N. Muford Rd.
Rockford, IL 61114-5699
(815) 654-5537 FAX(815) 654-4459
e-mail: abtc3gs@rvcc.cc.il.us

REGION 11 Madison Wisconsin Section (327)
Jay Bucher
Promega Corp.
5445 E. Cheryl Pkwy.
Madison, WI 53711
(608) 277-2522 FAX(608) 277-2516
e-mail: jbucher@promega.com

REGION 12 Canada Region (1200)
Wayne Sampson
Pyton Atlantic, Inc.
201 Wright Ave.
Dartmouth, NS B3B 1V6 Canada
(902) 488-3344 FAX(902) 488-1203
e-mail: wsampson@pylonelectronics.com

REGION 12 Canada Region Secretariat (1200.1)
Marilyn Ross
Depl. Natl. Defense
QETE-12
Ottawa, ON K1A 0K2 Canada
(613) 994-1189 FAX(613) 997-2523
e-mail: m.ross@defndndrc.gc.ca

REGION 12 Eastern Canada (1210)
Wayne Sampson
Pyton Atlantic, Inc.
201 Wright Ave.
Dartmouth, NS B3B 1V6 Canada
(902) 488-3344 FAX(902) 488-1203
e-mail: wsampson@pylonelectronics.com

REGION 12 Quebec (1220)
Adrian Michel
BAE SYSTEMS Canada, Inc.
900 Dr. Frederick Phillips Blvd.
St. Laurent, PQ H4M 2S9 Canada
(514) 748-3000 x4074 FAX(514) 748-3149
e-mail: Adrian.Michaud@baesystems-canada.com

REGION 12 Eastern Ontario (1230)
Jim Mullins
Pylon Electronics, Inc.
147 Colonnade Rd.
Nepean, ON K2E 7L9 Canada
(613) 226-7920 FAX(613) 226-8195
e-mail: jim.mullins@pylonelectronics.com

REGION 12 Western Ontario (1240)
Carlos Bennizon
Atomic Energy of Canada, Ltd.
CPFS Sheridan Park SP3
2251 Speakman Dr.
Mississauga, ON L5K 1B2 Canada
(905) 823-6049 x2199 FAX(905) 823-6446
e-mail: stefan.zucarusc@aecl.ca

REGION 12 Western Canada (1250)
Dr. Malcolm Smith
Westcan Calibration Services
99-12240 Harsumach Way
Richmond, BC V7A 4X9 Canada
(604) 275-0610 FAX(604) 275-0610
e-mail: msmith@netcom.ca

REGION 13 India Region (1300)
Dr. S.L. Sarnot
Depl. Elect., STQC Directorate
Mnsitry of Information Technology
6 CGO Complex
New Delhi, 110 003 India
011 91 11 436 3069 FAX011 91 11 436 3083
e-mail: sarnot@mit.gov.in

REGION 13 Bombay (1310)
Dr. (Mrs.) Bhamra Iyer
Central Inst. for Res. on Cotton Tech. (ICAR)
Adenwala Road, Matunga
Bombay - 400 019, India
011 91 22 412 7273 FAX011 91 22 411 0835

REGION 13 Hyderabad (1320)
Dr. S.P. Vasirreddi
Vista Labs Limited
142, IOA Phase II
Cherlapally, RR Dist.
Hyderabad - 500 051, India
011 91 40 624141 FAX011 91 40 62867

REGION 13 Bangalore (1330)
B.K. Srinivas
Bharat Heavy Electricals Limited
(Electronics Division)
P.B. No. 2606, Mysore Road
Bangalore, Karnataka - 560 036, India
011 91 80 6985958 FAX011 91 85 6740137
e-mail: srinivasbk@bhel.nic.in

REGION 13 Delhi (1340)
K.C. Chitra
Electronics Regional Test Lab. (North)
STQC Directorate
Okhla Industrial Area, Phase II
New Delhi 110 020, India
011 91 11 583 6219 FAX011 91 11 582 1583
e-mail: erltn@doe.ernet.in
902 GIDEP METROLOGY COMMITTEE
Jim Carlton
GIDEP Operations Center
P.O. Box 6000
Corona, CA 92878-8000
(909) 273-4958 FAX(909) 273-5200
e-mail: carltonja@corona.navy.mil

903 MEASUREMENT SCIENCE CONFERENCE (MSC)
Robert Johnson
Verizon Logistics ERG
2970 Ireland Empire Blvd.
Ontario, CA 91761-4904
(909) 945-0225 (909) 945-0222
e-mail: robert.johnson@verizon.com

904 ORGANISATION INTERNATIONALE DE METROLOGIE LEGALE (OIML)
Dr. Charles Einrich
NIST
Bldg. 820, Rm 234
100 Bureau Dr., Stop 2150
Gaithersburg, MD 20899-2150
(301) 975-5414 FAX(301) 975-5414
e-mail: charles.einrich@nist.gov

905 AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION (A2LA)
Ramona Saar
American Association for Laboratory Accreditation
5301 Buckeyestown Pike, Suite 350
Frederick, MD 21704
(301) 662-2974

906 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)
Craig Gulka
NCSL International
1800 30th St., Suite 305B
Boulder, CO 80301-1026
(303) 440-3439 FAX(303) 440-3494
e-mail: cgulka@ncslinternational.org

907 CONFERENCE ON PRECISION PRECISION ELECTROMAGNETIC MEASUREMENT (CPEM)
Norman B. Belocki
7413 Mill Run Rd.
Derwood, MD 20855-1150
(301) 889-4529
e-mail: n.belocki@ieee.org

908 ISA INTERNATIONAL
Mike Suraci
Lockheed Martin
P.O. Box 6429
Silverdale, WA 98380-6429
(360) 396-8353 FAX(360) 396-6737
e-mail: mikesuraci@lmco.com

909 EUROPEAN COOPERATION FOR ACCREDITATION (EA)
Graham Cameron
Standards Council of Canada
270 Albert St., Suite 200
Ottawa, Ontario K1P 6N7 Canada
(613) 238-3222 FAX(613) 995-4564
e-mail: gcameron@sc.gc.ca

910 INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS INSTRUMENTATION & MEASUREMENT (IEEE I&M)
Dr. David Braudaway
103 Ranch Rd.
P.O. Box 9
Barda Park, NM 87007-0000
(505) 281-3691 FAX: same (call first)
e-mail: dbbraudaway@worldnet.att.net

911 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
Roxanne Robinson
American Assn. for Lab Accreditation
5001 Buckeyestown Pike, Suite 350
Frederick, MD 21704
(301) 889-4520

912 COUNCIL FOR OPTICAL RADIATION MEASUREMENTS (CORM)
John V. Fishell
Naval Warfare Assessment Sta.
Measurement Science Directorate
P.O. Box 5000
Corona, CA 92878-5000
(909) 273-5221 FAX(909) 273-4904
e-mail: fishelljv@corona.navy.mil

913 INTERNATIONAL MEASUREMENT CONFERENCE (IMEKO)
Mike Suraci
Lockheed Martin
NSB Bangor
P.O. Box 6429
Silverdale, WA 98380-6429
(360) 396-8353 FAX(360) 396-6737
e-mail: mikesuraci@lmco.com

914 AMERICAN PHYSICAL SOCIETY
Dr. Klaus Jaeger
Jaeger Enterprises
13635 Calle Tarabia
Saratoga, CA 95070-4910
(408) 741-0620 FAX(408) 867-3705
e-mail: jaegerent@home.com

915 INSTITUT DE LA METROLOGIE DE FRANCE (IMMF)
Robert Johnson
American Assn. for Lab Accreditation
5001 Buckeyestown Pike, Suite 350
Frederick, MD 21704
(301) 662-2974

916 NATIONAL LAB ACCREDITATION COOP. (ILAC)
Anthony Anderson
Guildline Instruments
103 Commodore St., Suite 160
Lake Mary, FL 32746
(407) 333-3327 FAX(407) 333-3309
e-mail: Tanderson@Guildline.com

917 NATL. CONF. OF WEIGHTS & MEASURES
Georgia Harrel
NIST
Office of Weights & Measures
100 Bureau Dr., Stop 2350
Gaithersburg, MD 20899-2350
(301) 975-4041 FAX(301) 975-0647
e-mail: gharr@nist.gov
LIAISON DELEGATES (Cont’d)

926 ASIA/PACIFIC METROLOGY PROGRAM
Dr. Katuo Seta
Research Center for Measurement Standards
1-1-4 Umezono, Tsukuba Science City
Ibaraki, Japan 305-8563
011-81-298-54-4362 FAX:011-81-298-54-4393
E-mail: s-apmp@nrim.go.jp

927 ASOCIACION MEXICANA DE METROLOGIA (AMMAC)
Roberto Benitez
Metroc, S.A. de C.V.
Alejandro Reyes & 2620
Piso 2, B. Reyes
Monterrey, N.L. 64501 Mexico
011-52-87-702600 FAX:011-52-81-294666
E-mail: roberto@metroci.com.mx

928 AMERICAN SOCIETY FOR QUALITY (ASQ)/ MEASUREMENT QUALITY DIVISION
Christopher L. Grachanen
Compaq Computer Corp.
Corporate Metrology, MS: 070110
P.O. Box 692000
Houston, TX 77070-2098
(281) 518-6486 FAX(281) 518-7275
E-mail: chris.grachanen@compaq.com

929 NORTH AMERICAN CALIBRATION COOPERATION/NORTH AMERICAN METROLOGY COOPERATION (NACC/NORAMET)
Ching Faison
NIST
Stop 2140
100 Bureau Dr.
Gaithersburg, MD 20899-2140
(301) 975-5304
E-mail: faison@nist.gov

930 INSTITUTE OF ENVIRONMENTAL SCI. & TECH.
Robert L. Mielke
Abbott Laboratories
Dept. 736, R41
1400 Sheridan Rd.,
N. Chicago, IL 60064
(847) 938-9111 FAX(847) 937-4634
E-mail: robert.mielke@abbott.com

933 ASIA PACIFIC LABORATORY ACCREDITATION COOPERATION (APLAC)
Peter S. Unger
American Assn. for Lab Accreditation
5301 Buckeystown Pike, Suite 350
Frederick, MD 21704
(301) 644-3212 FAX(301) 662-2974
E-mail: punger@aplac.org

934 NATIONAL ASSOCIATION FOR PROFICIENCY TESTING (NAPT)
Gaylord DeGroot
MTS Systems
14000 Technology Dr.
Eden Prairie, MN 55344
(651) 937-4442 FAX(651) 937-4515
E-mail: gaylord.degroot@mts.com

935 BRAZILIAN SOCIETY OF METROLOGY (SBM)
Mauricio Nogueira Frota
Sociedade Brasileira de Metrologia
Av. Beira Mar. 262/5 Andar Castelo
Rio de Janeiro, RJ 20021-060 Brazil
011-5521-544-5751 FAX:011-5521-544-5527
E-mail: mfrota@mec.puc-rio.br

2001 NCSL INTERNATIONAL WORKSHOP & SYMPOSIUM
July 29-August 2, 2001 — Washington, DC

VP/Conference Management: ................. Mike Suraci ................. (360) 396-8535 FAX (360) 396-8737
Director: .................................. Ramona Saar ................. (301) 644-3201 FAX (301) 662-2974
Meeting Planner ...................... Tom Huttermann ................. (716) 554-6295 FAX (716) 554-4434
Registration ................. Joan Wilshire ................. (303) 440-3339 FAX (303) 440-3384
Technical Program ................. Richard Pettit ................. (505) 844-6242 FAX (505) 844-4372
Tutorials Program .................. Klaus Jaeger ................. (408) 741-0620 FAX (408) 867-3705
Guest Program ................. Berta Hakes ................. (301) 644-3222 FAX (301) 662-2974
Publicity ................. Craig Gulka ................. (303) 440-3339 FAX (303) 440-3384
Finance ................. Leon Barnes ................. (816) 997-5480 FAX (816) 997-3856
Best Paper Selection ................. Jeff Gust ................. (219) 428-6504 FAX (219) 424-1031
Conference Evaluation ................. Rose Molzko ................. (650) 595-8878 FAX (650) 595-1285
Entertainment ................. Ed Pritchard ................. (865) 574-4261 FAX (865) 574-2802
Door Prizes ................. Mike Suraci ................. (360) 396-8535 FAX (360) 396-8737
NCSL Exhibit Booth ................. Craig Gulka ................. (303) 440-3339 FAX (303) 440-3384
NIST/NCSL Anniversary Activities ................. Sharrill Dittmann ................. (301) 424-5107 FAX (301) 869-3548
Co-Chair ................. Ed Nemeroff ................. (561) 287-3547 FAX (561) 287-3547

IF YOU HAVE NAME/ADDRESS/PHONE/FAX/E-MAIL CHANGES TO THE NEWSLETTER ORGANIZATIONAL ROSTER, OR CHANGES TO THE ORGANIZATION CHART, MAPS, OR METROLOGY CALENDAR
Please fax changes directly to the NCSL International Business Office,
(303) 440-3384, or E-mail at info@ncsilnternational.org

54
### BOARD OF DIRECTORS' MEETING DATES

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 29-Aug 3-4</td>
<td>Washington Hilton and Towers</td>
</tr>
<tr>
<td>May 1, 2001</td>
<td>Washington, DC</td>
</tr>
<tr>
<td>Oct 22-24, 2001</td>
<td>Radisson Woodlands Hotel</td>
</tr>
<tr>
<td>Jan 27-30, 2002</td>
<td>The Cliffs at Shell Beach</td>
</tr>
<tr>
<td>Apr 29 - 30 and</td>
<td>The Golden Hotel</td>
</tr>
<tr>
<td>May 1, 2002</td>
<td>Golden, Co</td>
</tr>
</tbody>
</table>

### NEWSLETTER EDITORIAL SCHEDULE FOR 2001-2002

<table>
<thead>
<tr>
<th>Issue Date</th>
<th>In Mail</th>
<th>To Printer</th>
<th>Last Editorial to Editor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 01</td>
<td>1 Oct. 01</td>
<td>15 Oct. 01</td>
<td>1 Sep. 01</td>
</tr>
<tr>
<td>Jan. 02</td>
<td>1 Jan. 02</td>
<td>15 Dec. 01</td>
<td>1 Dec. 01</td>
</tr>
<tr>
<td>Apr. 02</td>
<td>1 Apr. 02</td>
<td>15 Mar. 02</td>
<td>1 Mar. 02</td>
</tr>
<tr>
<td>Jul. 02</td>
<td>1 Jul. 02</td>
<td>15 Jun. 02</td>
<td>1 Jun. 02</td>
</tr>
</tbody>
</table>

**EDITOR'S NOTE:**
This schedule is for guidance for anyone who needs to submit material for publication in the Newsletter.

### FUTURE CONFERENCES

- **2001 NCSL International Workshop & Symposium**  
  July 29-August 2, 2001  
  Washington Hilton and Towers  
  Washington, DC

- **2002 NCSL International Workshop & Symposium**  
  August 4-8, 2002  
  San Diego, CA

- **August 17 - 21, 2003**  
  **2003 NCSL International Workshop & Symposium**  
  Tampa, Florida

- **July 11 - 15, 2004**  
  **2004 NCSL International Workshop & Symposium**  
  Salt Lake City, Utah

Abstracts are required for Workshops, Panels, and Papers. For more information contact:
NCSL International Business Office  
1800 30th St., Suite 305B  
Boulder, CO 80301-1026  
Tel: (303) 440-3339  
Fax: (303) 440-3384  
E-mail: info@ncslinternational.org

### NCSL INTERNATIONAL PUBLICATIONS CLUB

If your company is already a member of NCSL International, then you may be eligible to subscribe to the NCSL International Publications Club and receive your own copy of the many publications available through NCSL International. Contact the Business Office for details – (303) 440-3339. See inside for application, or go to the NCSL International web site at www.ncslinternational.org