**EDITOR'S MESSAGE**

**Hurricane Katrina vs. Ken Garcia and Lockheed-Martin**

The world watched with helpless horror as Hurricane Katrina scudded across Miami with 75 mph winds, picked up energy in the Gulf, to Category 5, 175 mph winds, and headed for New Orleans. Then, as it approached the coast, it veered right, dropped to Category 4, and the eye passed right over the top of Ken Garcia's Lockheed-Martin lab at the Stennis Space Center just west of Gulfport, MS.

As near as we know, Ken and family and his lab personnel are OK, lots of damage of course. Ken took a few minutes in his busy recovery period to write us a short note, which is admirable for its creativity. Imagine bringing your standard resistors to your own home for protection from the storm.

See Ken's story on page 12. Guy Fleming, at the Sunnyvale Lockheed-Martin, who had to deal with our big earthquake in 1991, adds a few words.

**Getting it right**

Some of you cynically-oriented readers might think that for an international organization devoted to quality and data integrity, your newsletter commander might get your newsletter mailing done right. Alas, we struggle to gain 100% accuracy, and still fall short at times.

(Continued on page 30)
2005 Annual Workshop and Symposium
This year's annual Workshop and Symposium at the Washington Hilton & Towers, Washington, DC, held on August 7-11, 2005 was a great success. The theme of this year's Conference was:

Advances in Science and Technology - Their Impact on Metrology

Due to the excellent support from the NCSLI membership, the conference attendance was the highest in three years; thanks to all of you for your participation. I would like to congratulate Dr. Richard Pettit on receiving NCSLI International's highest award, the Wildhack Award. Dick has been an outstanding contributor to NCSLI, serving in recent years as Vice President of Measurement Science & Technology and the Chairman of the Conference Technical Program, an annual task that no one should have to do more than one year. Until his recent retirement, Dick was a Metrology Manager at one of the premier metrology labs in the country, the Primary Standards Lab at Sandia National Laboratory.

Dr. Hratch G. Semerjian from NIST was our Keynote Speaker. In addition, Dr. Semerjian and I hosted NMI Directors/Representatives from around the world on a tour of the new AML facility at the NIST campus in Gaithersburg. After the tour, a NIST/NCSLI reception was held at the AML Lab. The tour and reception was an excellent venue to meet the new Director of NIST, Dr. William A. Jeffrey, to exchange information, and establish worldwide metrology contacts.

Congratulations to the following "Best Paper" award winners:

John Kitching "Chip-Scale Atomic Clocks at NIST" Also overall Best Paper winner.
Dennis Minor "Stabilization of SPRTs for ITS-90"
Fiona Redgrave "Metrology...Who Benefits and Why Should They Care?"
Alan Steele "Simplifications From Simulations"

I would like to thank all of the conference committee and the many volunteers who helped make the conference successful.

2005 In Review
This year has really gone by fast; it just does not seem like January 1st was that long ago. The Executive Committee has been trying something new for the last two years in which we continue working from year to year on initiatives that need several years to complete. Jeff Gust, next year’s President, is going to continue the same type of plan with his additional objectives. We are starting to see some results of these initiatives such as:

- 8-10 new publications will be available soon.
- Increased marketing of NCSLI such as the conference material.
- An NCSLI magazine will be published soon.
- In 2006, the deliverables to NCSLI members will increase.
- NCSLI has made several changes in the way that Education and Training will be approached.
- The International division is becoming more stable as a lot of the vacant positions are being filled plus there are several International regions becoming active.
- The Dimensional Committee was officially formed.
- The Legal Metrology became an official committee.
- The NCSLI workshops on uncertainty continue to be successful.

The items listed above are just a few of the many projects that are being worked on. This year's Board of Directors has worked very hard to represent you, the metrology community.

Tribal Knowledge
As I visit labs around the world, I find that there seems to be a loss of this thing called "tribal knowledge." I suppose I should explain what I mean by tribal knowledge. It is the things calibrators do without thinking about what they are doing. If you read a book, it does not explain these things that calibrators do by instinct. The dimensional tribe has a lot of this tribal knowledge. If you watch a person who has been calibrating gage blocks for a long time (20+ years), he will move the gage block back and forth on the platen just before he puts the gage block in position. I have asked why they did that and they said "did what?" If you watch someone from the electrical tribe take resistance measurements at a high level, they go to get the right cables and connectors and do not even think about low thermals cables, etc. You tell someone from the electrical tribe to measure low AC voltage at low frequency and they will automatically set the measuring device to the proper settings without thinking.

What I have found in my travels over the last few years is that a lot of the calibrators who have this tribal knowledge are retiring. Some of the metrology labs do not have the budget to have someone work along with these experienced calibrators who can impart this tribal knowledge. In the past, a lot of labs have relied on the military to train calibrators and pass on the tribal knowledge. With the reduction of military trained calibrators, the labs now have to hire calibrators with no previous experience. I do believe that metrology labs need to have calibrators cross trained on other workstations. I do not think we could ever gather all of the tribal knowledge in a book; we as metrologists need to continue passing on our tribal knowledge.

(Continued on page 26)
2005 WILDHACK AWARD

Dr. Richard Pettit, Sandia National Laboratories (retired)
2005 Wildhack Award Winner

Wildhack Winner Dr. Richard Pettit

Dr. Richard Pettit, recently retired from a career at Sandia National Laboratories, Albuquerque, NM, has received the 2005 William Wildhack Award from NCSLI International. It is presented annually to recognize outstanding contributions to the field of metrology and measurement science, consistent with the goals of NCSLI. The award was presented August 8, 2005 at the organization’s annual Workshop and Symposium in Washington, DC, by Past President Dave Agy, who chaired the selection committee.

The Wildhack Award was established in 1970, in honor and recognition of William Wildhack, Sr., a long-time employee of the U.S. National Bureau of Standards, now the National Institute of Standards and Technology. Wildhack was not only very instrumental in the founding of the NCSLI, but also, through his wisdom, his leadership, his dedication and foresight, he helped shape the organization during its early formative years. He chaired the committee which developed the NCSLI Bylaws, the original committee structure and secured the initial “NBS” sponsorship that helped to established the thriving organization we have today. Wildhack himself served as the NBS Sponsor for the fledgling NCSLI during its early years. The award carries an honorarium and includes a bronze and silver medallion bearing the likeness of Wildhack. This year’s recipient is the 30th individual to be so honored.

Pettit’s award was based on his more than 20 years of service to NCSLI in its management ranks, his contributions to the technical successes of NCSLI, his excellent management of the NCSLI conference technical program, and his considerable industrial accomplishments in the field of industrial metrology, including numerous technical publications.

The 2005 Wildhack award is presented to Richard Pettit by Selection Chair Dave Agy.


THE WILDHACK 2005 CITATION
Dave Agy, Selection Chairman

Good afternoon ladies & gentlemen. As Immediate Past President, it is my great pleasure to present the 2005 William A. Wildhack Award. This Award is the highest honor of the NCSLI International and is given to an individual or group of individuals for outstanding contributions in the field of Metrology. The contributions may be in any appropriate form including oral presentation, conference paper, technical or administrative innovation or accomplishment, and outstanding leadership to NCSLI.

The purpose of the award is to provide incentive for and recognition of outstanding contributions to the field of Metrology and, in particular, contributions that are consistent with the goals and objectives of the NCSLI International.

The award carries an honorarium of $1,500 and an appropriately inscribed plaque.
Let me say that this part of my NCSLI board career is one of the most gratifying, in that this award is peer recognition of an individual's accomplishments in the field of metrology. And, as in past years, there were several deserving candidates this year. At this point in the presentation, if we've done a good job, the recipient doesn't know that they are about to get the award! However, the next couple of sentences ALWAYS give it away.

Although this year's recipient is a registered quality engineer, his degrees are in physics, go figure! In 1966 our recipient received a Bachelors in Eng. Physics, from the University of Michigan and a Ph.D., in Applied Physics, from Cornell University in 1971. He then joined the technical staff at Sandia National laboratories in August 1971 in the High Temperature Science Division. Activities & awards include:

- Certified Quality Engineer (CQE), ASQ, 1992.
- Member American Association. for the Advancement of Science (AAAS)
- Member American Physical Society (APS)
- Member, American Society for Quality Control, 1992-present

In April, 1986, he was promoted to manager of Sandia's Primary Standards Laboratory overseeing electrical metrology, a position he held until his retirement last year.

As an aside, he was appointed to this position on April Fool's day in 1986!

He has been involved in NCSLI Activities for more than 20 years in NCSLI; major activities include:

From 1994-1998, he served as Chair of the NCSLI Intrinsic/Derived Standards Committee. During this time, he developed and published a "Catalogue of Intrinsic and Derived Standards" that documented the important properties, and associated literature references, for these standards. In addition, two new RISP's were published: (1) "Triple Point of Water Cell" and (2) "Quantized Hall Resistance." Finally, the "Array Josephson Junction" RISP was updated.

Dick, oops did that give it away, has served as Vice President of Measurement Science and Technology from 1998. During his tenure, the Chemical Metrology Committee was started, with the assistance of Klaus Jaeger and Tom Ouimet. The committees reporting to him published a RISP detailing the calibration of deadweight pressure gauges (RISP-4); developed a definition for the term "Intrinsic Standard;" developed a standard "Certificate of Participation" for laboratories that participated in NCSLI sponsored interlaboratory comparisons; published a "Guide for Interlaboratory Comparisons" (RP-15); and published a RISP titled "Two-Pressure, Two-Temperature Humidity Generator" (RISP-5).

He served as NCSLI Workshop and Symposium Technical Program Chair for 2001, 2002, 2003, 2004, and 2005 conferences. This activity involved setting up a Technical Review Committee for rating of all unsolicited abstracts and then organizing the top rated abstracts into compatible technical/quality sessions. He also maintained a list of "Reserve Papers" that were used as replacement talks for speakers who can not attend the conference. Starting in 2002, he assisted the NCSLI Business Office in the development of a web-based system for the submission of both abstracts and manuscripts electronically. During his tenure, the submission of manuscripts has improved each year to a level of over 85%.

As manager in the Sandia Primary Standards Laboratory (PSL), he encouraged several PSL staff members to become involved in NCSLI activities, including: Tom Wunsch, currently VP of Operations & Stu Kupferman who served as Chair of the Publications Committee for many years until his retirement;

He was a charter member of the National Cooperation for Laboratory Accreditation (NACLA) representing the Dept. of Energy's National Nuclear Security Administration (DOE/NNSA). He served on the Board of Directors for 2 years and was responsible for the development of the NACLA Quality Manual. In addition, by working with NNSA quality managers, he was successful in having DOE/NNSA officially accept the use of calibration laboratories that are accredited by a NACLA recognized accreditation body. The DOE/NNSA was the first US Federal Agency to adopt this policy, which is saving them 10's of thousands of dollars each year. He also has assisted in working with the Nuclear Regulatory Commission (NRC) in order to obtain their acceptance of accredited calibration laboratories in specific situations.

An uncommonly well-published scientist, Dick has written over 80 technical papers on a variety of subjects, including critical phenomena, optical measurement techniques, solar properties of materials, optical modeling of solar collectors, etc. In the area of metrology, he has authored papers on issues in maintaining intrinsic standards, uncertainty analysis in mechanical testing, process measurement assurance, and the uncertainties associated with multifunction calibrators. He also contributed an uncertainty example on optical measurements for the NCSLI publication titled "Determining and Reporting Measurement Uncertainties."

Previous winners of this prestigious prize gather to congratulate the latest winner.

Since his retirement from Sandia National Labs in 2002, Dick continues to live in Albuquerque with his wife, Ellen. They have two married children, William and Elizabeth, and two grandchildren, a girl, 8, and boy, 3. Based on his NCSLI volunteer duties above, it seems clear that the Laws of Physics would give him little time for hobbies, but he does enjoy gardening, camping, bicycling, and photography. He and Ellen also enjoy traveling, and they have hosted several foreign exchange high school students over the past 20 years.
**CONFERENCE KEYNOTE 2005**

Hratch G. Semerjian, Deputy Director, NIST

---

### Expanding the Frontiers of Measurement

Hratch G. Semerjian
Deputy Director, NIST, U.S.A.

2005 ICESL Workshop and Symposium
Advances in Science and Technology: Their Impact on Metrology
Washington, D.C.
August 8, 2006

---

### Standards in ancient times

- Standard unit of length
  - Length of Pharaoh's forearm plus width of his palm
  - *Pharaoh*

- *Royal Cubit Master*
  - Primary standard is granite

- Standardization of the cubit
  - A unit of length used for practical measurements

- Recalibration of cubit stick on each full moon
  - Calibration, standardization

- Uniformity of length measurement in Egypt was achieved to
  - a relative accuracy of 0.05% over a distance of 200 meters

- Long term stability? *Standard* Pharaoh?

---

### Standards in medieval times

*Throughout the realm there shall be the same yard of the same 32 inches and it should be uniform.*

**Magna Carta of 1215**

*There shall be standard measures of length, weight, and corn.*

---

### The Industrial Revolution

*1788: The first & sixth century*

*1886: Western collectors made in the USA, used internationally, but calibrated in Germany due to lack of U.S. standards*

---

### NBS (NIST) established in 1901

*It is therefore the unanimous opinion of your committee that no more essential and useful be given to manufacturing, commerce, the makers of scientific apparatus, the scientific work of the government, the sciences, colleges, and universities than by the establishment of the NBS.*

House Committee on Census, Weights and Measures, March 15, 1907

On the establishment of the National Bureau of Standards (now NIST)

---

### NIST enables the future...

- by strengthening the innovation infrastructure to:
  - advance manufacturing and services
  - facilitate trade
  - enhance public safety & security
  - improve quality of life
  - ...and create jobs
  - ...through measurements, standards and technology...and partnerships

---

### NIST strengthens the innovation infrastructure to...

- ...advance manufacturing and services
  - microelectronics
  - *lean manufacturing* of materials
  - advanced manufacturing interoperability
  - pharmaceuticals
  - chemicals
  - fuel cell technology
  - healthcare

---

**Editor's Note:** I decided that this keynote slide set was more informative than the regular NIST News chapter. NIST NEWS will be back in Jan 2006.
Unparalleled Instrumentation, Measurement and Research Facilities

**NIST Center for Neutron Research**

Advanced Chemical Sciences Laboratory

**Advanced Measurement Laboratory**

**NIST AML Stacking**

Instrument Wing Cross-Section

AML: World's Best Measurement Lab

- **Dimensions:**
  - Class 1000
  - Class 100
  - Class 10

- **Temperature:**
  - 20°C ±0.35°C ±0.01°C

- **Humidity:**
  - 45% ±5% RH ±5% ±1%

- **Vibration:**
  - 3 to 0.2 mm/sec

Critical Criteria Central to Design of NIST AML

<table>
<thead>
<tr>
<th>Parameter</th>
<th>NIST Facilities</th>
<th>Modern Laboratories</th>
<th>Restricted NIST Labs</th>
<th>NIST AML Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>±0.35°C ±0.01°C</td>
<td>±0.5% ±0.1%</td>
<td>±0.1% ±0.01%</td>
<td>±0.35°C ±0.01°C</td>
</tr>
<tr>
<td>Humidity Control</td>
<td>45% ±5% RH ±5%</td>
<td>45% ±5% RH ±5%</td>
<td>45% ±5% RH ±5%</td>
<td>45% ±5% RH ±5%</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Class 1000</td>
<td>Class 1000</td>
<td>Class 1000</td>
<td>Class 1000</td>
</tr>
<tr>
<td>Vibration Control</td>
<td>2.5± 0.25 mm/sec</td>
<td>2.5± 0.25 mm/sec</td>
<td>2.5± 0.25 mm/sec</td>
<td>2.5± 0.25 mm/sec</td>
</tr>
</tbody>
</table>

AML Building Layout

AML Under Construction

AML Finished Product
Nano Research Environment Criteria

- Temperature and Humidity
  - 20°C with ±0.25 to ±0.1°C accuracy
  - 40 to 45% RH with ±45% to ±3% accuracy
- Cleanliness
  - Class 1000
  - Class 100
  - Class 10
- EMI-Free Environment
- Vibration
  - 3 to 0.2 micrometer/sec

±0.01°C Temperature Control Design

Cleanroom Lab Wing

- 12 clean room bays
- No offices in Cleanroom Wing
- Cleanroom is a shared resource
- Class 100 (upgradable to Class 10)
- Vertical laminar airflow to raised floor while wall return air system
- Basement level for non-clean services
- Visitor/Observation corridor

Test Results

Instrument Lab Wings

- Total of 167 Instrument lab modules
- Interior labs and perimeter office area
- All labs on-grade and vibration-isolated from building structure
- Standard labs temperature control ±/0.2°C
- Service corridors house noisy equipment and hazardous materials

NIST AML Vibration Isolation Slab

Metrology Lab Wings

- Total of 151 Metrology lab modules
- No offices in Metrology Wing
- All labs below grade and vibration-isolated from building structure
- 12 modules ±/0.01°C, 36 modules ±/0.1°C
- Most sensitive vibration areas equipped with heavy mass on air springs
- Service corridors located at rear of labs

Nano Fabrication User Facility
Nano Fabrication User Facility

Enhanced Metrology Capabilities Enabled by the AML - Temperature

AML 0.01 °C temperature controlled rooms are at least a factor of 10 improvement relative to the best-controlled of NIST's present buildings.

- This enables a reduction in measurement uncertainty, i.e., an increase in measurement accuracy, of the same order.
- Temperature control of 0.01 °C, rather than 0.1 °C, reduces the temperature contribution to the uncertainty in measurement of a 900-mm long industrial gage, to a state-of-the-art level of 50 nanometers.

The AML benefits:

- Improved reproducibility of measurements by a factor of two.
- Facilitated measurements with uncertainties of 70 nanometers on a 80-mm diameter.
- Permitted unattended remote calibrations.

Temperature Stability:

Moore Special Tool M48 High Accuracy CMM

Ultrasonic Interferometer Manometer (UIM)

Temperature Stability:

Two of four UIM's moved from GPL's to the AML...

- Two important improvements:
  - Type A uncertainty reduced 2x
  - Time required for built-in measurements also reduced 2x

Vibration Reduction:

Scanning Electron Microscope

Measures nanometer features such as line widths.

Movement of SEM into AML resulted in sharper images by reducing blurring due to vibration.

Resulted in increased confidence in NIST reference samples.

"This instrument has never worked better..." "Manufacturer's field service engineer"

Vibration Reduction:

AML Nano-Adhesion Force Measurements: Baseline Fluctuations

Reduction of baseline force fluctuation from ±150 nN to ±5 nN.
The U.S. Measurement System: A New NIST Initiative

The USMS is the complex of all methods, instruments, entities, institutions, and standards—both physical and documentary—involving in measurements of products and processes of significance to the economy, security, and quality of life of the Nation.

The Vision: A USMS that is healthy and capable of serving
U.S. institutions and citizens in the 21st century

Achieving the vision will bring substantial benefits to USMS customers and players and to the Nation.

More USMS information: Handouts available in NIST booth

Action Plan

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public launch</td>
<td>March 2005</td>
</tr>
<tr>
<td>Collect and analyze customer and stakeholder information</td>
<td>November 2005</td>
</tr>
<tr>
<td>Finalize agenda for USMS summit</td>
<td>November 2005</td>
</tr>
<tr>
<td>Convene US/WD Summit</td>
<td>January 2006</td>
</tr>
<tr>
<td>Release interim report on USMS summit</td>
<td>February/March 2006</td>
</tr>
<tr>
<td>Conduct post-summit workshops</td>
<td>Through May 2006</td>
</tr>
<tr>
<td>Publish “U.S. Measurement Needs and Opportunities Assessment”</td>
<td>July 2006</td>
</tr>
<tr>
<td>Coordinate actions to address critical needs</td>
<td>October 2005</td>
</tr>
<tr>
<td>Report to the Administration and Congress</td>
<td>December 2006</td>
</tr>
<tr>
<td>Monitor and report on progress</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Repeat process</td>
<td>Every 6 months</td>
</tr>
</tbody>
</table>

Health Care Measurements and EU IVD Directive Impact on International Trade

A New Driver:
• EU IVD Directive went into effect 2003
• Worldwide in vitro diagnostic device market is ~$50B
• 75% of European markets supplied by U.S.

Stated Purpose of Directive
• Eliminate barriers within Europe by ensuring access to the entire European market with one single product approval (CE mark)

Essential Requirements
• IVD manufacturers must be traceable to “standards of a higher order”—nationally/internationally recognised certified reference materials

Implementation
• IVD product with CE mark may be placed on market from June 2005 onwards
• All new IVD products must have mark by December 2005
• Existing IVD products may be sold without the CE mark until December 2005

NIST assets and mission

3,000 employees
Gaithersburg, Maryland
Boulder, Colorado
Ashville, South Carolina

1,000 guest researchers
650 users of facilities

$858 million FY 2005 budget

NIST Laboratories
Advanced Technology Program
Manufacturing Extension Partnership
Baldrige National Quality Program

NIST mission
• To develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life.
**Economic assessment of NIST programs**

1997  Radiopharmaceutical standards  
97:1 benefit-to-cost ratio

1998  Alternative refrigerants  
4:1 benefit-to-cost ratio

2000  Sulfur in fossil fuels  
113:1 benefit-to-cost ratio

---

**NIST Laboratories’ products and services**

**Research**
- 2,100 publications/year

**Standard Reference Data**
- 50 types available
- 5,000 units sold/year

**Standard Reference Materials**
- 4,300 products available
- 30,000 units sold/year

**Calibrations and tests**
- 3,250 items calibrated/year

**Laboratory accreditation**
- 800 accreditations

**Standards committees**
- 2,360 NIST staff, 450 committees

**Metrology Training Courses**
- 75 per year

---

**HURRICANE KATRINA VS. KEN GARCIA AND LOCKHEED-MARTIN**

*Ken Garcia, Staff Metrologist, Lockheed-Martin Technical Operations*

My home is 40 mi inland from the mouth of the Pearl River and Gulf Coast. Hilly country, about 150 feet above sea level. I have a monolithic basement with a renewable energy system. We had 20 family refugees from the coast. Katrina's eye passed directly over us; I was taking pressure readings with a W&T barometer. It got down to 27.58 inches around noon then back up and the wind changed 180 deg as the back of storm passed. Trees were downed all around the house, with some minor roof damage and rain intrusion. The larger of 2 solar panel arrays was knocked down; fortunately it was still aligned due south for most sun.

We're harvesting approx 800 watts during full sun, used to get 1 kW with both arrays up and turnable. Energy is stored in bank of 8 type L16 batteries, connected series parallel for a 24V system. Turned into 120/240 VAC by twin Trace DR1524 power inverters. Capable of powering home lights, fans and water well, small dorm fridge for Dad's insulin. I also found a few spare solar panels and some DC fans that help keep everyone cool. All in all we have it great, compared to most folks. Mom & Dad's house was completely destroyed. Primary standard NIST resistors are safe in the basement with some Zener standards.

Bev and I are in the lab today trying to get stuff going. We're almost out of liquid Helium.

More later...

---

*Editor's Note: To which Guy Fleming, Lockheed-Martin, Sunnyvale, CA, adds:*

I am sure there are a lot of lessons learned there that could be shared within our community. I know when we had the big earthquake hit (1989) we learned how to make a good recovery to assure our lab is back in full compliance. I am sure Mark Hayes and Ken Garcia will have some great info to share when they get a moment to reflect their thoughts, but for now they have other priorities.

They have accounted for all their folk and as of this morning all at the lab are accounted for. We can all breathe a sigh of relief on that one and thank God for answering our prayers.
BEST PAPER AWARDS

Invited Paper
Best Overall-Allen Astin Award

Dr John Kitching
NIST

"Chip-scale Atomic Clocks at NIST"

*******

Theoretical Metrology

Alan Steele
National Research Council of Canada

"Simplifications from Simulations"

*******

Quality and Best Management Paper

Fiona Redgrave
National Physical Laboratory, U.K.

"Metrology...Who Benefits and Why Should They Care?"

Applied Metrology

Dennis Minor
NIST, Gaithersburg, MD

"Stabilization of SPRTs for ITS-90 Calibrations"
Conference V.P. Carol Hockett meets Keynote Speaker, Hratch Semerjian, Deputy Director of NIST, prior to his kickoff speech.

Old timers and new-comers find a friendly atmosphere, before perhaps heading out to other places, or just settling in after a long international trip.

Director Semerjian presented a comprehensive overview of NIST, which is captured on the informative slides on pages 6-12.

Even families are involved. Washington, DC is such an outstanding place for educating young people on the operations of the U.S. government and its history. One of my family's best memories came from the Smithsonian Aerospace and History Museums.

The Sunday night reception is an informal "Welcome to the Conference" event which offers a light buffet and a chance to see old friends and make new ones.

I remember my year as President in 1978, when I stood before a banquet assembly like this and marveled at the global reach of our organization. The technology we represent is one thing, but I found the personal relationships to be more significant. It is only at a conference that those personal connections come together.
At the banquet, the Galileo Players group entertained the audience by selecting one of our members as "Genius." Who else could that possibly be other than Dr. Richard Pettit, our reigning Wildhack Award winner this year? Except that the Players referred to it as the WILD---HACK! We don't get no respect.

The International Dinner event started small decades ago, but now involves most conference attendees, to honor and welcome our global member travelers to the U.S. This year the dinner guests cruised the Potomac on the "Dandy Potomac Cruises."

Gary Jennings and his wife, Kim, enjoy the ambience of the water around the city of Washington, DC.

Wow, watching the sunset and the DC skyline, with technical and personal friends is surely one of life's better moments.

It takes a large, dedicated group, and then-some to plan, organize, and present an International conference of this magnitude. All aspects are represented: Tutorials, Office Staff, Speakers, Arrangements, Entertainment, Events. We owe you all a lot. And a lot of you will be back next year for more punishment.

The conference served to bring in a large group of Global NMI leaders, so they took advantage of the gathering to visit the new NIST.
During the NIST visitation, NCSLI President Harry Moody introduced the newly appointed Director of NIST, William Jeffrey, who offered his welcoming remarks to the visitors.

Dr. Clark Hamilton, CEO VMetrix of Boulder, CO, was honored with an IEEE award, presented by Harry Moody (r) during the conference. The Joseph F. Keithley Award was awarded in recognition of Hamilton’s vast success with his Josephson Array Voltage Standards work in his previous NIST career. He had previously been awarded the NCSLI Wildhack Award.

The President’s Reception, sponsored by Fluke Corp, is another opportunity for some fine buffet and conviviality during the unwinding sessions in the evening.

The President and CEO of ANSI, Mark Harwit, gave the NCSLI members an overview of his organization's work and connected common objectives with NCSLI. For the management of the industry Z540 standard, our NCSLI Business Office is an official ANSI Secretariat.

Our Wednesday luncheon speaker, Greg Hahn, provided the entertainment. I can tell you that this is the ONLY photo of Greg that didn’t have a beverage spilled on his shirt, so I assume that he was entertaining.

Thursday’s luncheon speaker was John Kitching of NIST. John was also the winner of the Best Overall Paper in the judging of the technical papers. John also mentioned that, unlike Hahn, he was not going to put his tie in his mouth.
Dick Pettit (l), who manages the massive technical program, invites all the speakers to a breakfast to start out their day. At his table were included Roger Burton, Jack Ferris, Fiona Redgrave (who also won a Best Paper award), and others. Dick, DON'T EVER LEAVE NCSLI.

Technical Tutorials are an important part of the NCSLI conference these recent years. This year there were 19 different sessions. Here, Dana Leaman of A2LA presents, "Lab Accreditation from A to Z."

Mike Osimette of the Canadian National Research Council, presents his Tutorial "Uncertainty Made Easy." I could read from this slide blowup: "**Estimate uncertainty only to the extent you need--don't make a science of it," and "**Accept that you'll never be certain about uncertainty."

The annual gathering gives NCSLI management the opportunity to recognize the exceptional contributions of several dozen volunteers. Angel Pobellon (l) receives an Outstanding Coordinator award from Harry Moody.

An award for their completion of RP-9 Recommended Practice goes to (the envelope please):
Front: Barbara Belzer, Dana Leaman and Roxanne Robinson
Back: Jim Allred, Doug Faison, James Jenkins and Larry Nielsen.

Wayne Benda (l) receives an NCSLI Service Award from V.P. Derek Porter for his many years of Regional Coordination of the Southern California and Arizona areas. I found Wayne's attention to detail on my use of digital photos to be very helpful.

Editor's Note: More exhibit photos in the January 2006 issue Georgia's photographic team shot over 3000 pictures all around the conference, and we appreciate their commitment to capturing the essence of the event. Here are the names of the team: Bill Hinton, Charlie "the big chicken" Mays, Don York, Shawn Mason, Ed Pritchard, Mike Suraci, Dave Agy, Derek Porter, Dana Leaman, and Georgia Harris. We also acknowledge the computer support from NCSLI staff member Larry Johnson.
METROLOGY CALENDAR

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

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

April 4-6, 2006
International Conference on Metrology CAMET2006-JM2006
Casablanca, Morocco
CONTACT: Saloua Banbarya
e-mail: <camet@acmetrology.com>
website: <www.acmetrology.com>

MANUFACTURING & MEASUREMENT
CONFERENCE
Ed Pritchard
April 24-27, 2006
DoubleTree Nashville
Nashville, TN
<www.qualitymag.com/mmcw>

Call for Papers

The organizing committee is seeking presentations for our workshops on the following and related topics:

Measurement Issues and Strategies:

• Temperature control on measurements
• Can software compensate?
• How do you set up your facilities?
• Scanning CMM's
• Vision Systems
• Effects of Temperature control on measurements
• Improvements in Laser Scanning

Measurement in Manufacturing Situations:

• In-line measurement/inspection
• On-machine measurement
• Cost Savings by Scrap Reduction
• Increasing Throughput
• Thread Gaging from GSG

Submission of abstracts: December 16, 2005
Notification of acceptance: January 2, 2006
Submission of completed paper: March 1, 2006
Submission of completed presentation: March 31, 2006
Tabletop exhibits available. Contact:
Ed Pritchard, Workshop Director
Phone: 865-574-4261, Fax: 865-574-2802
<epritchard@tds.net>

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

You can submit information on your upcoming Region/Section meeting, Committee meeting, or other Metrology-related event on the web! Just click on “Calendar” then “Submit an upcoming event”.
Get listed and increase awareness and attendance!
EUROMET REPORT
Seton Bennett, Chairman, EUROMET

Euromet and EA

On 8 June, I signed a Memorandum of Understanding with Daniel Pierre, the outgoing Chairman of EA, the European Accreditation cooperation. This MoU, recognising the need to strengthen the links between EUROMET and EA, represents an agreement to work together in the interests of all those with a stake in metrology and laboratory accreditation in Europe.

There are specific commitments to ensure the timely exchange of information on matters of common interest and to identify opportunities for mutual representation in selected committees and working groups. The MoU also recognises the importance of reaching agreement on matters of common interest and of communicating our joint views to other interested parties.

Under the terms of the MoU, both EA and EUROMET will continue to invite representatives or observers to each other’s General Assemblies and will also meet bilaterally on at least an annual basis in order to address jointly those aspects of metrology and the accreditation of laboratories which require common interpretation. They are also committed to encouraging their members to explore cost effective arrangements for the use of each other’s services and to cooperating closely to improve the comparability of calibration and test results. It is envisaged that discussion of the use of inter-laboratory comparisons will facilitate the monitoring by EA of the comparability of results from accredited calibration laboratories, with the two organisations working together to provide guidance in the field of calibration where both consider it necessary.

This guidance has been available for some time in the form of calibration guides prepared by EA and its laboratory accreditation predecessor EAL, but ownership of these documents has now passed to EUROMET, which is currently reviewing their status with a view to revising and updating where necessary. They are listed on the EUROMET website at <http://www.euromet.org/docs/calguides/index.html>.

Other issues which will be jointly addressed by EUROMET and EA include the accreditation of calibration laboratories with very small uncertainties, the use of ILCs to ensure the equivalence of laboratories in different countries and the application of ISO Guide 34 to accredited reference material producers. The Memorandum of Understanding recognises the importance of reaching a common agreement on such issues and paves the way for closer collaboration between NMI s and accreditors in Europe.

********

BIPM REPORT
Andrew Wallard, BIPM Director

1. Long term planning.

The last General Conference on Weights and Measures (CGPM) in 2003 recognised the need to respond to a number of metrological needs in new areas. In order to address them, the CGPM encouraged the BIPM to collaborate with user bodies in these areas, to establish Joint Committees, or to work through existing Consultative Committees. Since then we have made a number of significant advances, especially in chemical metrology.

We shall soon start to prepare our next workplan and associated budget proposals for the 23rd CGPM in 2007. The CIPM Secretary, Dr Robert Kaaris, will be updating the review of world-wide needs in metrology he made for the last CGPM.

2. Laboratory medicine - the JCTLM

We continue to be pleased by the progress in laboratory medicine under the Joint Committee for Traceability in Laboratory Medicine, the JCTLM. In addition to the close co-operation with our formal JCTLM partners, the International Federation for Clinical Chemistry and Laboratory medicine, IFCC, and ILAC, we are working with the World Health Organisation, especially in the area of biological units and traceability. JCTLM’s working group 1 is well advanced with lists of “standards of a higher order” as required by the In Vitro Diagnostic community and which will be entered onto the BIPM’s JCTLM database later this year. Working Group 2 is concerned with lists of laboratories which are recognised as having the appropriate competences in diagnostic and laboratory medicine.

3. New Collaborations with other international organisations.

BIPM is now an observer on the CODEX Alimentarius, thereby providing a connection for us to the measurements needed by the food community.

We have been working with the World Meteorological Organisation in connection with their Global Atmospheric Watch programme.

On behalf of Member States of the Metre Convention, we have been working more closely with ISO, especially in the CASCO and REMCO committees.

4. JCRB.

The Joint Committee for the Regional Metrology Organisations (RMOs) and the BIPM (the JCRB) last met in May 2005. Recently, the JCRB has focused on arrangements for the end of the transition period of the CIPM MRA and, in particular, the necessity for signatories to the CIPM MRA to have their quality systems fully reviewed and in place by the May 2005 JCRB.

A number of NMI s have requested a temporary removal of some CMCs from the Key Comparison Data Base.
A new "clarification" document for the CIPM MRA confirms that ISO Guide 34 will be considered as the relevant quality standard requirement for CMCs.

5. Scientific Issues.

5.1 Materials metrology

In October 2004, the CIPM considered a proposal from the materials community for an activity, within the Metre Convention, on traceability and uncertainty in materials metrology. This is currently the subject of a working group led by Dr Seton Bennett of the UK’s National Physical Laboratory which will report to the CIPM in October 2005. Meetings of Dr Bennett’s group will look at how a more rigorous approach to SI traceability may be of benefit to the materials community and will outline possible workplans in a number of areas. CIPM will decide whether to adopt an activity in materials metrology and how it would be handled administratively.

5.2 Publications

Work continues on the 8th SI brochure, on supplements to the Guide to uncertainty in Measurement (GUM) and the next edition of the international vocabulary of metrology (VIM). We hope to see publication of all three documents during 2005 or early 2006.

5.3 The SI

In recent years there has been increasing discussion on the possibility of redefining a number of base units of the SI. Encouraged by results from a number of NMI s working on the so-called "Watt Balance" experiments which relate the international prototype kilogram to electrical units, there is a real possibility of a redefinition of the kilogram based on a fixed value of the Plank Constant or Avogadro's Constant. In addition, should the kilogram be redefined, there are implications for the Ampere and, perhaps somewhat more distantly, the mole. Similar moves are afoot to consider a redefinition of the Kelvin based on new and better knowledge of the Boltzmann Constant. This may also have implications for the candela.

All these new concepts will be reported to the 2007 General Conference on Weights and Measures with the possibility of new definitions being adopted by the CGPM in 2011. We are now entering an intensive period of consultation with interested parties from user communities that may be affected by these changes.

6. Collaboration with ILAC

6.1 The JCRB and the last meeting of NMI Directors both endorsed the importance of a joint statement by BIPM and ILAC on the roles and responsibilities of NMIs and National Accreditation Bodies (NABs). This was presented to the first ever meeting of RMOs and Regional Accreditation Bodies at the BIPM in March 2005 and will be presented to NMI Directors and the ILAC General Assembly.

BIPM will also be working with ILAC and the OIML on a statement on the use of their various Mutual Recognition Arrangements or, in the case of OIML, their Mutual Acceptance Arrangement. This statement, requested by the 22nd CGPM, will urge Governments and other relevant parties to use recognised MRAs as the technical basis for trade and other agreements or treaties.

BIPM’s collaboration with the accreditation community therefore continues to develop and ILAC supports BIPM’s overall responsibility for the world measurement system - essentially a combination of:

- equivalent national standards, demonstrably traceable to the SI through their realization and maintenance at the NMI level and validated through the CIPM MRA; and
- effective national traceability and measurement systems in which measurements are traceable to these national standards, at whatever level of accuracy is appropriate to the user. This traceability is generally achieved through a network of technically competent calibration and testing laboratories accredited to ISO/IEC 17025 or other appropriate written standard by a National Accreditation Body (NAB) which is a signatory to the ILAC Arrangement.

6.2 The CIPM MRA and the ILAC Arrangement are clearly complementary and mutually supportive and their unique combination helps to provide confidence in the equivalence of SI traceable measurements worldwide. This infrastructure is increasingly recognized as providing the technical basis for consistency of measurements and their acceptance in international trade and its use can help reduce or eliminate Technical Barriers to Trade.

6.3 At the March 2005 meeting, representatives of RMOs and RABs discussed how the various parts of the international and national metrology system should work together. Considerable progress was made at the meeting and a number of decisions taken about the next steps. Specific action assigned to RMOs and RABs include the following issues:

- To review whether the scope of accredited laboratories could be harmonised with those of the NMIs in the CIPM MRA;
- To identify ways of linking of CIPM key comparisons with ILCs or proficiency testing exercises run by accredited laboratories;
- For ILAC and RABs to inform their community about the Key Comparison Data Base which lists the Calibration and Measurement capabilities of the participating NMIs;
- Recognising that different interpretations of CMCs and BMCs have been a source of confusion, the meeting agreed that CMCs are a better way of referring to the day-to-day services available to clients of accredited laboratories as well as those of NMIs;
- To look at the possibility of treating NMIs which choose the accreditation route to demonstrate compliance with the CIPM MRA as a special group with extended periods of surveillance or with simple ways to update their scope between visits. This could help resolve difficulties when measurement uncertainties in an NMI accredited scope differ from those in the key comparison database;
- To review concerns from some in the accreditation community that some NMIs have an interest in the calibration market that compromises their role as an impartial organisation. The meeting agreed that there are differences in national policies as well as financial pressures on NMIs but wherever possible, NMI’s positions should be clearly stated and conflicts should be avoided;
- To help resolve concerns over the issue of impartiality of some NMIs from some regulators and accreditors. The working group accepted that the current draft ISO/IEC WD PAS 17001 reflects a workable approach and provides for risk assessments in those cases in which the two bodies were close administratively or were part of a single bureau of standards as is the case in many developing countries. This is now reflected on the ILAC web site in their "FAQs".

6.4 The Working Group will meet again in 2006 to review progress.
ILAC/NACLA REPORT

Anthony Anderson

International Laboratory Accreditation Cooperation (ILAC)

Laboratory Committee (LC)

In early June I attended the ILAC Executive, associated committee meetings, and the ISO-ILAC-IAF Joint Working Group (JWG) in Frankfurt, Germany as the Chair of the Laboratory Committee (LC).

As was reported in April, the vote on the FDIS ISO/IEC17025 amended standard was 96% in favor and was published on May 15, 2005 as ISO/IEC 17025: 2005. Although the changes to the 1999 version are considered minimal, this is a new standard and as such the next revision will not begin until 2009 and would take effect in 2012. This timetable finally synchronizes with ISO 9001 and the historical leap-frogging of the two Standards will go away. This will eliminate untimely revisions, such as when ISO/IEC17025 was published in 1999 referencing ISO 9001:1994 and ISO 9002:1994 and then in 2000 ISO 9001:2000 came into effect. This necessitated the hurried amendment of ISO/IEC 17025:1999 virtually before the ink was dry. Under the ILAC Arrangement, signatory AB’s are required to demonstrate that their accredited laboratories are in compliance with the new standard by May 2007.

I am pleased to report that the issue of having a statement on accreditation (attestation) certificates and calibration certificates and test reports regarding a laboratory’s management system has been settled. At the ISO-ILAC-IAF JWG meeting in Frankfurt in June all parties agreed upon the final wording for certificates and the Joint Communiqué which will accompany a certificate. At the time of writing the communiqué has been signed by the ISO Secretary General, and the ILAC and IAF Chairs, and is due to be published any day. I hope to have copies at the Board meeting. The Laboratory Committee (LC) of ILAC considers the language on certificates and the accompanying communiqué to be a major step forward. It will go a long way toward educating the market place to ask for accredited services to ISO/IEC 17025 and not ask that a laboratory has to be certified (registered) to ISO 9001.

The issue of competitive AB’s in some parts of the world is still a concept difficult to comprehend for Europe and some Asia Pacific countries. In addition, private sector accreditations are considered a detriment to regulator acceptance in these countries and there is an underlying perception that government AB’s are “better” than private sector AB’s, because of the elimination of the profit motive. (It should be noted that some private sector AB’s operate as not-for-profit organizations.) However, there are some who feel ILAC should discourage competition, which would be a backward step. Laboratories get much better service from AB’s by having choices; monogamous programs run the risk of creating market apathy and high costs for accreditation. So far ILAC has been neutral on the issue of multiple AB’s in certain economies, and has allowed multiple signatories to the Arrangement. Hopefully this will remain the position of ILAC.

The text of the ILAC Arrangement has changed slightly as a result of the 13 key differences between ISO/IEC 17011:2004 standard and the old Guide 58. The 47 signatories to the Arrangement will all re-sign the document in Auckland, New Zealand, in September.

The idea of having joint management of the ILAC and IAF MRA’s, brought up as a last minute resolution at the Cape Town General Assembly last year, continues to be a contentious issue and is being strongly promoted, particularly in Europe. A white paper on the issue has been written by one EA member and is being reviewed inside ILAC. The LC is concerned about the continual move to do more activities jointly with IAF. Some make sense, like cooperation on inspection, as both organizations accredit inspection bodies. ILAC would no longer have total control over its main product under any joint management agreement of the MRA.

The PT Consultative Group has been formed with representatives from PT Providers, AB’s, Laboratories and other interested parties. The first meeting will be in Auckland in September. The agenda will address the committee membership, its mode of operation and terms of reference. Other agenda items will include independent PT provider’s issues, laboratory issues, medical PT issues, developing country issues, ISO Guide 43 revision and International PT comparisons in support of the Arrangement.

ILAC P9, “Minimum PT requirements for accredited laboratories” has been published and becomes effective January 1, 2006.

I attended a meeting of the ILAC/IAF Joint Committee for Closer Cooperation (JCC) while in Frankfurt. As has already been reported, IAF endorsed the solution of the ISO 9001 statement on certificates issue.

As a result of the outcome from the survey on joint meetings there is now no support, particularly on the IAF side for the LC’s concern over the length of joint ILAC/IAF conferences and general assemblies. The idea to separate them into two events at different times of the year as used to be the format prior to 2001 was also voted down.

National Cooperation for Laboratory Accreditation (NACLA)

The next meeting of the NACLA Board will be on August 5 and 6, 2005 in Washington, DC, just prior to the NCSLI Conference. I will give an oral report at the Board meeting. Since the last Board meeting, NACLA has begun the process of hiring a part time QA Manager and has solicited proposals to provide space for the Secretariat.

*******

ISO 17025:1999 comparison with ISO 17025:2005

At the April Board meeting I was assigned an action item to produce a comparison document for the amended ISO 1/IEC 17025 standard.


You can request a copy from my email (see the Anderson Roster) or send a request to the editor.

*******

Joint ISO-ILAC-IAF Communiqué (from the < www.ilac.org > website) 22 August 2005

ILAC members will be aware that many of their accredited laborato-

ries have been experiencing difficulty convincing their customers they should be asking laboratories to be accredited to ISO/IEC 17025, (prior to 1999 ISO Guide 25) rather than be certified (regis-
Reports from the Board

tered) to ISO 9001. The situation became more acute with the publication of ISO 9001:2000, as some customers continually asked laboratories to be certified, when they really meant accredited. The confusion is caused by the perception that accredited laboratories do not operate a recognised quality management system.

To address this problem the ILAC Laboratory Committee asked that a statement be put on accreditation (attestation) certificates, issued by their accreditation body, stating that an accredited laboratory's management system meets the principles of ISO 9001:2000. The same statement could also be used by accredited laboratories on their calibration certificates and test reports.

Working through the ISO-ILAC-IAF Joint Working Group (JWG), ILAC is pleased to be able to advise its member accreditation bodies that the problem raised by the Laboratory Committee may now be addressed as follows:-

On accreditation (attestation) certificates, accreditation bodies may add the following:

"This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated 18 June 2005)"

Accreditation Bodies choosing to use the above statement on their accreditation certificates should either supply, or provide access to (via a website), the Joint ISO-ILAC-IAF Communiqué as part of the package. (It may be convenient for accreditation bodies to do this when they issue new accreditation certificates for ISO/IEC 17025:2005 to their accredited laboratories.)

Accredited laboratories choosing to use the above statement on their test reports and calibration certificates should also either supply, or provide access to (via a website), the Joint ISO-ILAC-IAF Communiqué as part of the package for their laboratory customers.

The Joint Communiqué is available on the ILAC website at <www.ilac.org > in the Members' Area.

The ILAC Laboratory Committee thanks the members of the ILAC and IAF Executive Committees and the ISO-ILAC-IAF JWG, for developing a solution to a critical market issue facing some accredited laboratories.

Editor's Note: See Roxanne Robinson's 17025 paper on page 28.

*******

CENAM REPORT
Salvador Echeverria-Villagomez

In spite of budget restrictions, CENAM has worked closer with user sectors such as oil, food and automotive. Recent research and development projects assist these sectors: oil industry - joint project to develop a reference system for large flow of natural gas; electrical - reference system for high voltage; automotive - torque and hardness measurements.

In the area of primary metrology, CENAM has three new standards: Rockwell hardness, liquid flow, and magnetic flow. An important activity over the past two years is the peer reviews for the MRA. In the period from August 2004 to 2005, they have had peer reviews in twelve fields. Their ISO-9000 quality system was successfully reviewed last July. They are connecting this quality system with peer reviews to complete the system.

CENAM continues support to their National Metrology System by participating in several committees and laboratory assessment with the national accreditation entity. Their participation for accreditation has been reduced to a few laboratories that require CENAM experts. They continue to provide training and calibration services.

Measura network: Three more members have been added this year, one each in the automotive industry, water quality, and the food industry. In the food sector, there is a program called "Mexico Supreme Quality " for exports of natural products which is a brand the government gives to specific products. CENAM is developing the measuring facilities for these measurements.

Steve Stahley and Malcolm Smith participated with CENAM last October in workshops on metrology and standardization in the automotive industry in two cities in Mexico. Although there was a small number of participants -- 20 in one, 30 in the other -- they consider the effort successful and plan four more sessions in the future.

The CENAM Metrology Symposium is set for October 29 to 31 in 2006.

*******

SIM REPORT
João Alziro Herz de Jornada

João's report was presented by Luiz Carlos Gomes dos Santos, the Deputy Director of the Scientific and Industrial Metrology Directorate of INMETRO Brazil. Some of the SIM overview slides Carlos presented are available at <http://www.sim-metrologia.org.br>.

SIM Vision: "A representative, transparent and integrated regional metrology organization committed to ensure uniformity of measurements in the Americas."

Principal activities include the General Assembly, Council Meetings, Committee Meetings, Working Group Meetings, Intercomparisons, Workshops and Seminars.

SIM Council Meetings in 2005:

Barbados, February 7-8
Washington, August 7
Trinidad, October 10-14

At the February 2005 meeting in Barbados, eight resolutions were approved of which Carlos highlighted two:

1. Confirmed the designation of Anthea Ishmael from BNSI, Barbados, as chairman of the Quality System MWG

Dianne Lalla-Rodrigues was elected as the new SIM President at the last SIM General Assembly in November 2004. The next SIM
General Assembly is scheduled for October 10-14, 2005, in Trinidad and will have an awareness seminar on Chemical Metrology and Legal Metrology.

Main SIM Representatives:

1. SIM President: Dianne Lalla Rodrigues
2. SIM Executive Secretariat, OAS/OEA: Oscar Harasic
3. Technical Advisor Chair: B. Stephen Carpenter
4. Technical Committee Chair: Luis Mussio
5. Professional Development Committee Chair: Yoshito Mitani
6. SIM JCRB Representative Chair: Luis Mussio
7. Quality System Task Force Chair: William Anderson
8. OIML GA Representative Cesar Luiz: LMWG Chair

*******

NRC/INMS REPORT
Jean Lafortune

Jean reported for Gary Hysert who is doing well in his fight against bone marrow cancer. (See Gary's own note on page 30).

1. INMS Restructuring: In late 2004, INMS underwent reorganization to facilitate its function as Canada's National Metrology Institute. Two groups which did not fit into the Institute's mandate were transferred to the NRC Institute for Microstructural Sciences in early December 2004. On February 21, 2005, Dr. Jim McLaren was appointed to the position of Director General of INMS. The roles of Directors were redefined with Dr. Alan Steele assuming Director of Metrology and Ms. Katalin Deczky assuming Director of Business and Research Support, both effective July 2005.

2. INMS Quality System Progress Report: The INMS Dimensional Metrology and the Mass Standards Programs had on-site accreditation assessments to ISO/IEC 17025 in November 2004. The Standards Council of Canada (SCC) Program for the Accreditation of Laboratories-Canada (PALCAN) assembled the assessment team. The peer measurement experts came from NIST, CENAM and NMIA. INMS is currently addressing the findings from the assessment reports. After the SIM Quality Task Force (QSTF) meeting in Barbados in February 2005, the INMS Quality System Coordinator received QSTF approval of the quality system for Photometry & Radiometry, Acoustical Standards, Mass Standards and Dimensional Metrology. INMS will have all its programs assessed by SCC/PALCAN and peer evaluators by the end of 2006.

3. INMS participated in the planning or implementation of some 29 inter-NMI comparisons in pursuit of the CIPM MRA. Additional work was done in the Time Dissemination program and other international comparisons not falling under the MRA or SIM. Last year INMS spent approximately $1.5M on international activities

4. INMS received funding of $300K from the Canadian International Development Agency (CIDA) for a two-year project to develop the metrology infrastructure of Costa Rica in collaboration with the Laboratorio Costarricense de Metrología (LACOMET), the NMI of Costa Rica.

5. The Calibration Laboratory Assessment Service (CLAS) program was successfully re-evaluated by APLAC in November 2004. CLAS presented the tutorial "Measurement Uncertainty Made Easy" at the Conference.

*******

JEFFREY CONFIRMED BY SENATE AS 13TH NIST DIRECTOR

The U.S. Senate confirmed William Alan Jeffrey, a veteran manager of federal science and technology development, as the 13th director of the U.S. Commerce Department's National Institute of Standards and Technology (NIST).

Jeffrey, 45, was nominated by President Bush on May 25, 2005, to succeed Arden Bement, who was appointed director of the National Science Foundation in November of last year. NIST Deputy Director Hratich Semerjian has served as acting director in the interim.

"I'm very pleased to welcome Bill Jeffrey to the Department of Commerce team," said Commerce Secretary Carlos Gutierrez. "He brings a strong background in science and technology policy and the practicalities of research management to one of our nation's finest research laboratories and an institution whose work affects almost every aspect of our daily lives."

Jeffrey has been involved in federal science and technology programs and policy since 1988. Previous to his appointment as director of NIST, he served as senior director for homeland and national security and the assistant director for space and aeronautics at the Office of Science and Technology Policy (OSTP) within the Executive Office of the President.

Prior to that he was the deputy director for the Advanced Technology Office and chief scientist for the Tactical Technology Office with the Defense Advanced Research Projects Agency (DARPA). While at DARPA, Jeffrey developed research programs in communications, computer network security, novel sensor development and space operations.

Prior to joining DARPA, Jeffrey was the assistant deputy for technology at the Defense Airborne Reconnaissance Office, where he supervised sensor development for the Predator and Global Hawk Unmanned Aerial Vehicles and the development of common standards that allow for cross-service and cross-agency transfer of imagery and intelligence products. Jeffrey also spent several years working at the Institute for Defense Analyses performing technical analyses in support of the Department of Defense.

Jeffrey received his Ph.D. in astronomy from Harvard University and his B.Sc. in physics from the Massachusetts Institute of Technology. He resides in Herndon, Va.

*******

AMERICAN COUNCIL OF INDEPENDENT LABORATORIES (ACIL)
Joan Walsh Cassidy

At the Board meeting, Roxanne Robinson introduced Joan Walsh Cassidy, the Executive Director of ACIL. ACIL has a membership
made up of mostly testing laboratories. Roxanne anticipates a productive cooperation between NCSLI and ACIL especially in the area of education. Joan distributed a handout and gave an overview of the organization.

1. A voluntary, non-profit corporate membership organization founded in 1937.
2. Technical areas of focus: civil engineering, conformity assessment, environmental, food and pharmaceutical testing.
4. Mission: enhance members' success by; providing advocacy, education, services and mutual support; and promoting quality, ethics, independence, objectivity and free enterprise.
5. The organization's activities center around three meetings. These provide opportunities for interaction with NCSLI. The annual meeting is every October and this year is in Palm Springs, California from the 15th to the 18th. This meeting attracts the owners and senior managers of their member laboratories. Every February is a government relations focused meeting in Washington, DC. The spring meeting is a business practices meeting which focuses on how to grow and run a business better.
6. Currently they have 250 corporate members that operate 1800 facilities across the U.S. and abroad. Many of these are small business and only a few of their members are large companies.

She introduced Ellis Rosenberg, who has been a long time member of the ACIL Board of Directors. Among other things, he chairs the ACIL subcommittee on unfair competition, and is an active member of their Homeland Security Task Force. He said that there was much in common between NCSLI and ACIL including government relations. Their organization deals primarily with commercial testing services. They have excellent relationships with regulators and government agencies.

Joan continued and expressed that a meaningful area for synergy between NCSLI and ACIL is training.

Their dues range from $700 to $10,000 based on the member's testing revenue. There are adjunct memberships for internal laboratories with fees of $500 to $1000. They also offer a flat fee for associate or affiliate members. A2LA is an associate member. They have six full-time and three part-time employees in Washington, DC.

ACIL is not involved in writing standards although a few of their members are individually. Joan is personally involved as a member of the Board of Directors of ANSI.

********


12 May 2005. A new edition has just been published of an ISO/IEC standard acknowledged as the international benchmark for approving the competence of the testing and calibration laboratories that play a vital role in trade, in product development and manufacturing, and in protection of the consumer.

ISO/IEC 17025:2005, "General requirements for the competence of testing and calibration laboratories" replaces the 1999 edition which has been used to "accredit" (approve) some 25 000 laboratories worldwide that test products and samples, and calibrate precision instruments. However, the influence of ISO/IEC 17025 is even greater than this figure suggests since many countries make its use a legal requirement. In addition, documents derived from it are used by laboratories in specific sectors such as medicine and microbiology.

ISO Secretary-General Alan Bryden commented: "ISO/IEC 17025 benefits business, government and society at large. Confidence in the competence of laboratories is frequently needed by businesses when testing new products, or ensuring that finished products are fit for sale; by government regulators and trade officials that require assurance about domestic or imported products before they can be placed on the market; or for ensuring the quality and reliability of testing and analysis relating to environmental, health or safety hazards."

ISO/IEC 17025:2005 contains all of the requirements that testing and calibration laboratories need to meet in order to demonstrate to customers and regulators that they operate a sound management system which puts them in full control of their processes, are technically competent, and are able to generate technically valid results. Accreditation bodies that recognize the competence of testing and calibration laboratories will use the standard as the basis for their accreditation.

"Dependable testing and calibration laboratories are ones that have been duly accredited as competent and ISO/IEC 17025:2005 is the laboratory accreditation standard that, like the edition it replaces, will be counted on by business and governments worldwide," declared Peter van de Leemput, who led the ISO group of experts that carried out the work.

The new, 2005 edition, results from the amendment of ISO/IEC 17025:1999 to ensure its compatibility with the requirements of ISO 9001:2000, Quality management systems - Requirements. This became necessary because of the generalized adoption of quality management systems conforming to ISO 9001:2000, including many of the organizations that testing and calibration laboratories serve.

It also seeks to clarify that while compatible, the two standards are not inter-changeable. Although both standards can be used by laboratories as a framework for providing their customers with confidence that they are managing their activities, only ISO/IEC 17025 can be used to demonstrate the technical competence specific to laboratories.

Labs may choose to be accredited to ISO/IEC 17025, or be certified to ISO 9001:2000, or both, but the processes of accreditation and certification would still be two separate actions, although highly facilitated - both for the laboratories and the assessors - by the consistency now ensured between the two standards.

There are no essential changes to the technical requirements. The modifications relate mainly to the management requirements in the document to reflect the content of ISO 9001:2000, especially in a greater emphasis on the responsibilities of top management, on the need to demonstrate a commitment to continually improve the effectiveness of the management system, on customer satisfaction, and on internal and customer communication about the management system.

Peter van de Leemput summed up: "Laboratories that have described and controlled their processes within the laboratory - as
already required by the 1999 edition of ISO/IEC 17025 - will only have minor adjustments to make to their existing procedures to ensure that the new orientations in the management requirements are fulfilled."

The International Laboratory Accreditation Cooperation (ILAC) has set a transition period of two years from date of publication of the new edition - 12 May 2005 - for accredited laboratories to comply with the standard's requirements.

ISO/IEC 17025:2005, "General requirements for the competence of testing and calibration laboratories." costs 112 Swiss francs and is available from ISO national member institutes and from ISO Central Secretariat. It was developed by Working Group 25 of ISO/CASCO, Committee on conformity assessment.

Contact the ISO Store: to order ISO/IEC 17025:2005, "General requirements for the competence of testing and calibration laboratories."

Enquiries about orders:
Ms. Sonia Rosas Friot, Marketing Services
Tel. +41 22 749 03 36 Fax +41 22 749 09 47
E-mail < sales@iso.org >

********

EUROLAB (EUROPE)
Horst Czichos

EUROLAB and NCSLI share a mutual membership since the end of 2004. Prof. Horst Czichos is EUROLAB representative to NCSLI and attended the Board of Directors meeting in Washington this year for the first time. We would like to thank the NCSLI members for the warm welcome. Also for the first time EUROLAB is now providing a short report for the NCSLI Newsletter and therefore would like to introduce itself with a few words:

About EUROLAB

EUROLAB aisbl (aisbl - association internationale scientifique sans but lucratif) is the European Federation of National Associations of Measurement, Testing and Analytical Laboratories and is since 1998 a legal entity in the form of an international association under Belgian law. Members of EUROLAB comprise laboratory associations in 26 of the 30 EU, EFTA and applicant countries. The EUROLAB members represent a network of about 2000 public and private laboratories and conformity assessment bodies.

In addition, several partner organisations in the field of conformity assessment as well as laboratory organisations from other regions of the world co-operate with EUROLAB as international affiliated members.

New Presidents after the EUROLAB General Assembly 2005

EUROLAB held its General Assembly in March 2005 in Bilbao, Spain, where Marc Mortureux, director of LNE, France (Laboratoire National de métrologie et d'Essais) was elected new EUROLAB President and Bent Larsen, director of Force Technology, Denmark, was elected new Vice-President. Manfred Golze, BAM, Germany, was re-elected as Secretary. It was decided to transfer the Technical Secretariat from BAM to LNE, Paris, in the beginning of the next year.

EUROLAB activity priorities for 2005/2006

On the basis of the activity plan for 2005 the priorities for the next period were defined and include now for instance:

Further promotion of EUROLAB networks as actual platforms for exchange of experience within the laboratory community.

Enhancement of co-operation, information and support of the everyday-work of the members especially by promoting the activities of the Technical Committees and technical Working Groups and by co-operation within international organisations such as the PLG.

Organization of workshops strengthening the dialogue with accreditation bodies (e. g. on accreditation with flexible scope).

Current Technical Activities of EUROLAB
Technical Committee on Quality Assurance

The aim of the TCQA is to facilitate the quality assurance work in laboratories and to enable efficient procedures. The present work program comprises the subject areas quality systems, technical items and accreditation. The results of the TCQA are used to produce position papers, comments and background material in order to influence and improve the conditions for laboratories.

A very important issue is extension of the concept of flexible scope in accreditation. In order to facilitate laboratories' life during assessments, a "cook book" is being developed for difficult items. Furthermore, the issue of measurement uncertainty is treated in a separate working group and in Technical Reports. In addition, there is a TOP reading list on Measurement uncertainty available on EUROLAB's website.

Joint EUROLAB/CEOC Technical Committee on Product Testing and Certification

JTC PTC, a joint committee of EUROLAB and CEOC (European Confederation of Organisations for Testing, Inspection Certification and Prevention), is focusing on issues of product certification and inspection bodies and bodies notified for the directives of the European Commission. Concerning the latter, the Review of the "New Approach", which is the current system of European Directives regulating product areas relevant for safety and CE marking, is closely followed. Important issues of the current discussions are the future role of EA and accreditation also within the notification process improving and harmonising market surveillance as a task for the EU member states possible new structure of conformity assessment modules (mirroring ISO 9001:2000) role of CE marking with regard to private marks.

Further ad-hoc working groups

Working group on a computer guideline within accreditation to ISO/IEC 17025

Working group on measurement uncertainty from sampling (jointly with Eurachem and other partner organisations)

Working group on measurement uncertainties obtained from different ways
EUROLAB Networks

The General Assembly agreed to set up sector-specific EUROLAB networks, serving as communication platforms in the internet for members within specific fields. EUROLAB-Danmark is hosting a network in the field of electrical calibration, ENECal. It provides a good possibility for exchange and development of experiences by discussion of different problems around accreditation/calibration/measurement in the field of electrical calibration in an informal way. The chairman Peter Høgh Hyllested has just started the topic by an interlaboratory comparison.

EUROLAB information

Technical Information is provided to the members in Technical Reports and Position Papers. In addition, EUROLAB publishes an Electronic Newsletter several times a year. The EUROLAB Homepage is available at <www.eurolab.org>.

Technical Report 1/2005: Survey on the accreditation of proficiency test providers

In Europe, accreditation systems for the accreditation of calibration laboratories have been in existence since the 1970s and for testing laboratories since the end of the 1980s. The accreditation of PT providers has only recently started in Europe. So far the accreditation bodies have not harmonised their approaches to the accreditation of PT providers and there has never been an in-depth debate on the need for this new type of accreditation activities. Therefore in August and September 2004 EUROLAB performed an inquiry among approx. 300 European PT providers, listed in the PT database EPTIS (<www.eptis.bam.de>), to collect their views on accreditation. The results of this inquiry are presented in the EUROLAB Technical Report 1/2005.

Coming important EUROLAB events


President's Message (continued from page 3)

Next Board of Directors Meeting

The next Board of Directors meeting will be held in Myrtle Beach, SC, on Sunday through Wednesday (Oct 23-26, 2005). One of the objectives of holding Board of Director meetings at different locations is to evaluate possible future conference sites. Myrtle Beach will present their package for a conference at their location during the meeting. If you have time, stop by and see what goes on at the Board meeting. You as NCSLI members are always welcome at these meetings.

Wildhack Award

Next year I will be the chairman of the Wildhack Committee. It will be my responsibility to assemble a committee, solicit qualified candidates, and conduct the selection process. What I am requesting at this time is that you, the NCSLI members, recommend to me possible candidates for the award. With the recommendations I need several paragraphs of information showing why this person deserves the Wildhack. This description will be part of the ballot. Remember that the Wildhack winner is someone who has made significant contributions to metrology.

Final Thoughts

Since this will be my last President's message, I would like to thank all of you for your support. The year has been interesting, exciting, and a lot of fun. I would like to say that the metrology community has a lot of outstanding individuals whom I have had the privilege to get to know.

NCSLI President
Harry J. Moody
In this issue of the Educators' Corner we will be highlighting an exciting program and a valuable resource for encouraging and promoting the engineering fields for our young folks. Many articles have been written and studies conducted that raise concern over the decreasing numbers of graduating engineers in the U.S. as well as the adverse effect of these decreasing numbers on the U.S. competitive technology edge and our national security. Over the time period 1992-2002 there was a 50% decline in students interested in engineering and a 14% decline in engineering degrees awarded to U.S. students [1]. It is projected [2] that in order to meet current job forecasts, we need to add 100,000 engineers every year for a decade (the U.S. graduates approximately 60,000 engineers a year). Some hard hitting facts are [3]:

- Europe graduates 3 times as many engineers as the U.S.; Asia 5 times
- 46% of the degrees awarded in China are engineering degrees
- Only 5% of U.S. degrees are in engineering

So what is U.S. industry doing to help reverse this trend?

THE INFINITY PROJECT - Engineering Education for Today's Classroom

The Infinity Project is a K-12 and early college math and science-based engineering and technology education initiative designed to help educators deliver a maximum of engineering exposure with a minimum of training, expense and time. The Infinity Project was created to help students see the real value of math and science and its varied applications to high tech engineering. Often high school students pose the question, "When am I ever going to use all this math and science in the real world?", without fully appreciating that they are already using it when they use cell phones, MP3 players, the Internet and many other technological innovations.

The Infinity Project content was developed by a world-class team of university faculty, high school teachers, working engineers, and leading researchers originally sponsored by the Southern Methodist University School of Engineering and Texas Instruments. The Infinity Project uses advanced Digital Signal Processing (DSP) technology developed by Texas Instruments to show how science and math lead directly to technology products and solutions. Most importantly it shows how engineering can be an exciting way to combine technical knowledge with creativity to build a rewarding career in engineering. For educators the Infinity Project is a turnkey program that transforms their classroom into a hands-on engineering learning environment. The program provides all of the resources needed to teach a year's worth of engaging coursework. The key elements of the Infinity Program are:

- State-of-the-art curriculum
- Easy-to-use, classroom technology kits
- Best-in-class professional development and teacher support for science, math or technology teachers

The Infinity Project is working with schools all across the country to bring the best of engineering to their students. If your child's school doesn't already participate in the Infinity Project, you can do your part to inform their teachers and administrators about the Infinity Project by having them visit: <http://www.infinity-project.org>.

AGILENT EDUCATOR'S CORNER - Sharing Resources with Engineering Educators

Agilent Technologies Educator's Corner is a web-based resource for college and university engineering educators and researchers looking to enhance their higher education curriculum and research capabilities. Within its many web pages one will find electrical engineering insight, pre-written and interactive experiments, lecture assistance, reference materials, lab exercises, teaching tools, engineering student resources, and various research materials, as well as valuable information on education discounts from Agilent Technologies.

Of particular note is the wealth of teacher tools for use in classroom or labs such as slide presentations, pre-written lab experiments, Java animations, free computer-based training tutorials, and application notes in all areas of test and measurement. Agilent Technologies Educator's Corner also hosts an extensive range of engineering references, lab resources, student resources, as well as links for engineering sites, general education, general science, etc. To visit Agilent Technologies Educator's Corner go to: <http://www.educatorscorner.com>. While you are there you may want to check out one of my favorite Metrology based websites, Agilent Technologies Metrology Forum at: <http://metrologyforum.tm.agilent.com/>.

3. Source: Infinity-Project.org, Engineering Education for Today's Classroom
Roxanne M. Robison  
American Association for Laboratory Accreditation (A2LA)

1. History of ISO/IEC 17025

Since 1990, many laboratories and accreditation bodies used ISO/IEC Guide 25, "General requirements for the competence of testing and calibration laboratories" [1] as the requirements for ensuring competent laboratories and technically valid test and calibration results. As part of the normal process for revising ISO documents, Guide 25 was brought before ISO Working Group 25 in the late 1990's to be updated. The result was a new standard for the competence of testing and calibration laboratories called ISO/IEC 17025 (1999) [2].

Because the quality management system requirements of ISO/IEC 17025 (1999) agreed with ISO 9001 (1994) [3], laboratories operating in accordance with ISO 17025 could rightly claim that they also met the ISO 9000 requirements. This was a significant marketing advantage to the laboratories, especially for help in meeting the requirements of their clients who do not understand the difference between laboratory accreditation and ISO 9000 registration, and/or the suitability of ISO/IEC 17025 to the testing and calibration community.

However, during its normal revision process, the ISO 9001 and 9002 (1994) [3, 4] were dramatically revised in the year 2000, resulting in a more process-oriented standard, ISO 9001 (2000) [5]. With this revision, the quality management system requirements of ISO/IEC 17025 (1999) and 9000 (2000) no longer agreed. ISO/CASCO insisted that ISO/IEC 17025 be revised quickly to "agree" with 9000 (2000) so that there would be only one standard for quality management systems and the laboratories could continue to claim compliance with 9000 (2000).

After 2.5 years of work, in July 2003, Draft Amendment 17025 (DAM) came out as a minimal alignment to ISO 9000 [2000]. Originally it was hoped that the approval process could be fast tracked, but the DAM received negative votes when balloted as draft international standard (DIS). [6] Therefore, after further revision, the final draft international standard (FDIS) [7] was balloted in November 2004. ISO/IEC 17025 (2005) is being published and is not considered to be an amendment; it is a "new" ISO/IEC 17025 with a 2005 date.

The remainder of this paper will review the changes and additions to the requirements found in ISO/IEC 17025 (2000) and look at possible ways that a laboratory can demonstrate compliance with the new requirements.

2. A Look at the Changes to ISO/IEC 17025

First, there are some global changes that can be found throughout the document.

- The terms "quality system" or "laboratory management system" have been changed to "management system". There is a note to explain that "management system" means quality, administrative and technical systems that govern the operations of the laboratory.
- The term "client" has been changed to "customer".
- The term "non-conformances" has been changed to "non-conformities".

The list of references was revised to eliminate ISO 9001 (1994) and ISO 9002 (1994) and insert ISO 9001:2000.

It had been clearly stated in ISO/IEC 17025 (1999) that conformance to ISO 9001 does not demonstrate competence to produce technically valid results but, as mentioned earlier, laboratories operating in accordance with ISO 17025 could rightly claim that they also met the ISO 9000 (1994) requirements. Now, with the emergence of 9000 (2000) and the insistence on a minimal alignment of ISO 17025 (2005) with 9000 (2000), the Introduction was revised to indicate that ISO/IEC 17025 compliance does not imply that the laboratory's quality management system meets all of the quality system requirements of 9000 (2000). Further, section 1.6 was revised to indicate that laboratories complying with ISO/IEC 17025 (2005) also meet the principles of 9000 (2000). It should be noted that 9000 (2000) makes a very clear reference to the appropriateness of ISO/IEC 17025 accreditation for testing and calibration laboratories so laboratories can provide this reference to their clients.

Next, we will discuss the revisions to ISO/IEC 17025 by individual sections of the standard.

Section 4.1.5 was revised to add implementation, maintenance and improvement of the management system to the responsibilities of management and technical personnel. Laboratories must be sure that these new responsibilities are properly included in their relevant job descriptions and descriptions of roles and responsibilities found in their quality manual (see section 4.2.6).

Section 4.1.5(k) (new) says that the laboratory shall ensure that its personnel are aware of the relevance and importance of their activities and how they contribute to the achievement of the objectives of the management system. IOS/IEC 17025 (2005) section 4.2.2 also requires that the objectives be established and reviewed during the management review so the laboratory needs to be sure that its personnel are included in management review activities and understand the outcomes, conclusions and actions that result.

Section 4.1.6 includes a new requirement that top management shall ensure that appropriate communication processes are established within the laboratory and that communication takes place regarding the effectiveness of the management system. There are a number of ways to communicate this message including familiarization with quality manual text that speaks to continual improvement and effectiveness of the management system, participation in management review activities, and review of this issue during initial or refresher training on management system issues.

Section 4.2.2 has been revised so that the laboratory's quality policy no longer needs to include the overall objectives. However, the

*Conference Paper 2005

Editor's Note: The NCSLI Board requested that this status report on 17025 be published in October.
objectives must be established and reviewed during the management review. Instead of objectives, the quality policy statement must include the purpose of the management system. The previous edition of ISO/IEC 17025 (1999) had a requirement (4.2.2e) that the laboratory’s quality policy must include a statement relating to the laboratory’s management's commitment to compliance with ISO/IEC 17025. Now this statement must also include the continual improvement of the management system relating to quality. It is simple enough to make the required changes to the text of the laboratory's quality policy but, more importantly, the personnel must be made aware of quality policy’s messages.

Section 4.2.3 (new) indicates that top management shall provide evidence of commitment to the continual improvement of the management system. Commitment can be demonstrated through top management's active participation in development and revisions to the quality manual, monitoring and measuring the instances of non-conforming work, corrective actions and complaints, and using preventive and corrective actions to make necessary improvements. This clause requires that "evidence" be provided so management must be prepared to show records of monitoring and improvement. The management review process is an appropriate mechanism for looking at effectiveness of these improvements.

Section 4.2.4 (new) states that top management shall communicate to the organization the importance of meeting the customer as well as the statutory and regulatory requirements. Management should be sure that this message is delivered to personnel through their quality manual and that contract review procedures and processes are in tune to the needs of all customers, be they routine or special.

Section 4.2.7 (new) states that top management shall ensure that the integrity of the management system is maintained when changes to the management system are planned and implemented. Management should include all affected parties in the decisions to make changes, be sure that the changes do not run counter to the goals and objectives established by the laboratory, and take care that the changes still meet the requirements of ISO/IEC 17025.

Section 4.7.2 (new) also requires that the laboratory shall seek feedback, both positive and negative, from its customers. The feedback should be used and analyzed to improve the management system, testing and calibration activities and customer service. Certainly, the laboratory can look at the instances and nature of customer complaints as a type of negative feedback, but there is a note in ISO/IEC 17025 that gives examples of types of feedback including surveys and review of reports with the customer. In the end, the amount of feedback that is sought is up to the laboratory, but the laboratory must seek both positive and negative input.

Clause 4.12 was revised to require action plans when improvement opportunities or preventive action is required. So if a laboratory notes a need for improvement through data analysis, complaint handling, or the audit process, for example, they can use the action plan process already found in their preventive action procedure.

Clause 4.15 - Management review was revised to add recommendations for improvement to the laundry list of items to take account of when performing the management review. This item should be added to the management review agenda. Remember also that management reviews can take place more than (or less than) once per year. It may be more manageable to have mini-management reviews throughout a year to handle more promptly and effectively the actions and needs for improvements that might surface throughout the year.

The standard makes clear that top management, rather than executive management, shall conduct the review. The term “top management” is supposed to be a clearer indicator that the individual(s) responsible for the decisions that affect the laboratory are responsible for the management review.

Section 5.2.2, Personnel, was revised to include the need for an evaluation of the effectiveness of the training actions taken. It is not enough to provide training to the personnel; management must ensure that personnel are truly qualified. Proficiency testing (used in the broadest sense of the term) can serve as a means to evaluate the effectiveness of the training actions, along with monitoring the instances of non-conforming work or audit results.

Section 5.9 - there were two additions to this section that assure the quality of test and calibration results. First, subsection 5.9.2 (f), regular checking of equipment for stability and integrity was added. Maintenance and/or calibration procedures and schedules can prompt this check of equipment.

Clause 5.9.2 (new) states that quality control data shall be analyzed and where it is found to be outside pre-defined criteria, planned action shall be taken to correct the problem and to prevent incorrect results from being reported. Thus, acceptance limits must be defined, there must be a mechanism for monitoring the trends and drifts, and "preventive" or "corrective" action must be taken and documented. If the monitoring system is truly effective, more preventive actions rather than corrective actions will be taken.

Finally, Annex A was changed to compare the ISO/IEC 17025 (2005) to 9000 (2000) and the bibliography was updated.

3. Laboratory Implementation Schedule and the Future of ISO/IEC 17025

ISO/IEC 17025 is considered a brand new standard with a 2005 date so the next scheduled revision of this standard would begin in 2009 and would not go into effect until 2012. This schedule will ensure that there will be synchronization with the revision to 9000 (2000), so there should be no more "leapfrogging" and no more unnecessary and unscheduled revisions.

Accreditation bodies that are recognized under the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement are required to demonstrate their accredited laboratories' compliance with ISO/IEC 17025 (2005) beginning two years after the publication of the standard, so these accredited laboratories
are looking at a summer 2007 deadline. Some of the ILAC-recognized accreditation bodies have plans to offer gap analyses to ISO 17025 (2005) as part a laboratory’s regular assessment to the 1999 version of the standard for a limited time after the 2005 standard is published. Any gaps that are noted would have to be addressed with an appropriate corrective action and demonstrated effectiveness before accreditation to the new standard could be granted.

4. Conclusion

This amendment to ISO/IEC 17025 should have a minimal impact on the laboratory; the majority of the changes result in a larger burden on the management of the laboratory. There is a dilution in the stated equivalence of ISO/IEC 17025 and 9000 (2000); more responsibilities for management; an emphasis on continual improvement and personnel awareness of quality efforts and changes; a requirement for customer feedback use and analysis; an evaluation of training effectiveness and an improvement in analysis of quality control data.

A laboratory’s management system and technical operations are far more successful, effective and robust when management takes an active role in ensuring compliance with the requirements of ISO/IEC 17025. With the requirements of the amended ISO/IEC 17025 properly implemented, there should be a strengthened management system.

5. References

1) ISO/IEC Guide 25 (1990), General requirements for the competence of testing and calibration laboratories.
2) ISO/IEC 17025 (first edition, December 15, 1999), General requirements for the competence of testing and calibration laboratories.
6) ISO/IEC 17025 (DIS, 2003), General requirements for the competence of testing and calibration laboratories.
7) ISO/IEC 17025 (FDIS, September 2004), General requirements for the competence of testing and calibration laboratories.
8) ISO/IEC 17025 (second edition, 2005), General requirements for the competence of testing and calibration laboratories.

********

Editor’s Message (Continued from page 2)

The July 05 issue was one of those times. Our Canadian member delegates and the committee/regional volunteers were treated to duplicate mailings of that issue. I won’t go offering excuses, but suffice to say that since I moved the printing and distribution of this publication to Boulder, CO, we have tried several different mailing processes in the search for lower cost but still timely deliveries. In those trials, we ended up with some database label duplications that didn’t track the different methods of delivery. The Canadian members were the only ones affected. The US and International re-mailings have been just fine. By the way, by putting both the printing and distribution process into Boulder, we have saved considerable operating costs, and as far as I know, not suffered any serious delivery time increases.

But I should note for ALL you readers, that I depend on each of you to assure that you are getting your proper mailings. All member delegates get 2 copies with each issue. And your Appointing Officer of your company gets an additional copy, to assure that your NCSCI participation is noted. Volunteers on the roster pages in the back of each newsletter get a variable number, 2 for committee and 5 for region/section coordinators. These extra copies serve as promotional pieces for potential new members. Those volunteers can get more copies upon request to the Business Office.

If you aren’t getting the right number of copies, please contact the Business Office which maintains the newsletter mailing database.

John L. Minck
Editor

********

A MESSAGE FROM GARY HYERT, INMS REPRESENTATIVE TO THE BOARD

I haven’t had much communication with any NCSCI folks recently as I am going through a stem cell transplant procedure right now. My cancer is in remission since early this year but the doctors assure us that it will come back and be more resistant to the drugs I have had to date; it’s just not clear when it will come back.

So for me it was a question of a couple of years of reasonable health vs. 10 to 15 years with a successful stem cell transplant. They tried to transplant my stem cells back into me but couldn’t collect nearly enough for a transplant. So they decided to go for a matching donor. They always test your siblings first and wonder of wonders, my younger sister is a perfect match. So on 4 July I had four days of heavy duty chemo to kill off my own stem cells and then on the 11th they infused me with my sister’s cells that they collected that same day.

I am being treated on an out-patient basis as long as I’m feeling OK but as my blood counts go down because of the chemo the biggest risk I have is infection so I am maintaining a very low profile and avoiding crowds, stores, etc. Once my new stem cells kick in, probably in a couple of weeks, I will get new white cells and my immune system will be on the upswing, along with the rest of the blood cells. It takes probably a year for the blood system to be completely back to normal but I will be able to resume most of my activities well before that.

So that’s where I am. Sorry I missed you all in Washington this year, but hopefully will be mobile next year for the annual conference.

June 23, 2005

Editor’s Note: This has been a nasty couple of years for Gary. But the medical procedures sound like they are taking good effect. We wish him well. Most old-timers like myself pray for the early successes of those genome researchers who are looking for the silver bullets of bio-tech which will solve these problems.
TRAINING INFORMATION

METROLOGY TRAINING FOR U.S. COMPANIES IN CENTRAL AND SOUTH AMERICA AND THE CARIBBEAN

Now, calibration and metrology technicians from US companies operating there can log onto Introduction to Measurement and Calibration. Precision Dimensional, Electrical, Mass, Temperature and Flow Measurement. Terminology, concepts, procedures, relevant scientific principles and math, graphics and charts are combined with testing and a certificate of completion to provide the knowledge base necessary to build these skills.

To date, El Salvador has been the most active participant with over 200 course completions.

The project is sponsored by CENAM, NIST and SIM to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life.

For access instructions contact: Paul Hanssen, 952 471 8554, <phanssen@wptraining.com>.

*********

2006 UNCERTAINTY COURSES

Integrated Sciences Group
1-800-400-7866
<www.isgmax.com/training.htm>

Introduction to Uncertainty Analysis - Software Included!
March 27-28 and September 25-26, 2006, Bakersfield, CA
June 14-15, 2006, NCSLI Training Center, Boulder, CO

$895 per student. This two-day course provides an introduction to the principles of uncertainty analysis as found in the ISO Guide to the Expression of Uncertainty in Measurement (the GUM), published papers and current research. Type A and Type B methods of estimating measurement process uncertainties are discussed and multivariate analysis is outlined. Instruction involves minimal statistics with hands-on use of ISG's Uncertainty Sidekick freeware to illustrate concepts for a variety of direct measurement scenarios. The role that uncertainty estimates play in developing specifications and making decisions is also discussed.

Uncertainty / SPC Analysis - Software Included!
June 19-22, 2006, NCSLI Training Center, Boulder, CO
September 11-14, 2006, Portsmouth, NH

$1,895 per student. This four-day course provides straightforward and easy-to-understand principles of measurement uncertainty analysis for direct and multivariate measurements and measurement systems. Concepts and methods are consistent with those found in the "U.S. Guide to the Expression of Uncertainty in Measurement." Advanced measurement uncertainty analysis topics that extend these methods and concepts are also presented. Hands-on analyses using ISG’s Uncertainty Analyzer software provide practical application of important concepts to the development of uncertainty estimates for direct measurements, multivariate measurements and measurement systems. Applying uncertainty estimates to control measurement processes, establish calibration intervals, and minimize decision risk is also discussed.

*********

TIME AND FREQUENCY: MEASUREMENTS AND APPLICATIONS

Michael Lombardi
Phone: 303-497-3212 Fax: 303-497-3228
Email: <lombardi@boulder.nist.gov>
Home Web Page: <http://www.ncsli.org/>
Registration Web Page: <http://www.ncsli.org/>

October 5-6, 2005 NCSLI Training Center, Boulder, CO

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

The primary focus of the seminar is on reference standards, and the measurement methods and techniques used for frequency and time calibrations, for devices ranging from stopwatches to atomic oscillators. It covers both quartz and atomic frequency standards, and the use of Global Positioning System (GPS) disciplined oscillators. It also covers the many network and wireless signal sources used for time synchronization. It explains how to measure frequency offset and stability, and how to establish traceability for frequency and time interval measurements through NIST to the International System of Units (SI). Actual measurements will be demonstrated in the classroom, and the students will participate in the hands-on demonstrations.

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

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

Quametec Corp.
Karen Moor, (810) 225-8588
info@quametec.com
www quametec.com

2005: October 17-19 Detroit, MI
2006: January 23-25 Las Vegas, NV
February 22-24 Monterey, CA
March 20-22 Charleston, SC
April 24-26 Detroit, MI
May 17-19 Boulder, CO
June 21-23 Detroit, MI
July 17-19 Mississauga, ON
August 23-25 Seattle, WA
September 13-15 Harrisburg, PA
October 23-25 Detroit, MI
November 28-23 Detroit, MI

$1595 per student. Attendees will receive 3 days of hands-on Measurement Uncertainty training based on the GUM Method, plus a copy of our book, “Measurement Uncertainty Analysis Fundamentals” and a licensed copy of our software, “Uncertainty Toolbox for Microsoft Excel” developed by Quametec. See our website at www quametec.com for additional information, course outline and our unique class guarantee.

*********

SHORT COURSE: MICROWAVE MEASUREMENTS FOR HIGH PERFORMANCE DEVICES AND APPLICATIONS

NIST
David Walker, (303) 497-5490
dwalker@boulder.nist.gov
www.arftg.org

November 29-30, 2005 Washington, DC

$400 per student. This 1-1/2 day course covers microwave measurement fundamentals, including vector network analysis, scattering parameters, power, and thermal noise. Practical issues such as cables, fixtures probes, and on-wafer measurements are covered. More advanced measurement topics are also covered including microwave measurements for optoelectronic applications, scattering-parameter uncertainty analysis, electromagnetic compatibility, and an overview of wireless test instrumentation and nonlinear measurements.

This course is held in conjunction with the 66th ARFTG Microwave Measurements Conference on December 1-2. The course registration fee includes lunch both days. Lecture notes will be provided. Class size is limited.

*********

MET/CAL DATABASE AND REPORTS

Fluke Corporation
(425) 446-6330 FAX(425) 446-5992
caltraining@fluke.com

March 27-31, 2006 Boulder, CO

$2495 per student. This 5-day in-depth course uses hands-on sessions to teach a systematic approach to data collection and to consistently and completely manage your metrology assets. Learn to use a relational database, structured query language (SQL) and Crystal Reports to do powerful searching, sorting and reporting. MET/CAL Plus fully supports your traceability documentation requirements, including ISO 9000, ANSI/NCSL Z540-1, ISO Guide 25 and ISO 17025.

*********

MET/CAL PROCEDURE WRITING

Fluke Corporation
(425) 446-6330 FAX(425) 446-5992
caltraining@fluke.com

April 3-7, 2006 Boulder, CO

$2495 per student. In this 5-day in-depth course, you will learn to configure MET/CAL software to establish and maintain traceability, create and edit calibration procedures, and customize the format of reports and calibration certificates. The majority of the class time is spent in hands-on development of MET/CAL procedures and reports.

*********

AUDITING TO ISO 17025

Quametec Corp.
Karen Moor, (810) 225-8588
info@quametec.com
www quametec.com

April 27-28, 2006 Detroit, MI
August 21-22, 2006 Seattle, WA

$895 per student. Become qualified to be an internal Auditor for ISO 17025 compliance by taking the same course that we teach to Laboratory Accreditation Assessors. This 2-day course covers the full standard as well as provides tools and guidance on how to perform and document your Internal Audits. Get it right the first time with professional training on your side. Includes a CD loaded with tools and forms to simplify the required documenta-tion of your internal audit.

*********

PRINCIPLES OF METROLOGY

Fluke Corporation
(425) 446-6330 FAX(425) 446-5992
caltraining@fluke.com

May 1-5, 2006 Boulder, CO
September 18-22, 2006 Boulder, CO

$2495 per student. This is a 5-day workshop covering electrical/electronic measurements and calibration. Participants will receive extensive hands-on time with a wide range of measurement instructions. This course covers all aspects of dc/low frequency cali-bration.
METROLOGY JOB DESCRIPTION INITIATIVE UPDATE*

Chris Grachanen, Hewlett-Packard Co.

Talk to almost any calibration practitioner on the subject of new talent entering the Metrology profession and you will probably get the same response, "there are not enough young folks entering the field to replace the many seasoned professionals getting ready to retire." The Metrology profession, similar to other engineering disciplines in the U.S, is facing a recruitment crisis of epic proportions.

One reason young folks are not entering the Metrology profession is simply they are unaware of it at the time in their lives when they are making critical decisions about what career they would like to pursue. Students in their last year of high school and first years in college often rely on educators to learn about professions which are congruent with their likes and interests. To this end, educators frequently reference U.S. Department of Labor publications in order to provide students information about professions as well as forecasts about future job growth. One of the systems used by the U.S. Department of Labor, Bureau of Labor Statistics, to classify and subsequently compile information about professions, is the Standard Occupational Classification (SOC) system.

The SOC’s current job descriptions for calibration practitioners are inaccurate in communicating job expectations. Without faithful job descriptions, it is unlikely that prospective candidates will be steered into the Metrology field by educators. In addition, demographic information, such as how many folks are in the Metrology profession, how many folks are leaving the profession, etc., can not be accurately determined. In 2005, the U.S. Department of Labor, Bureau of Labor Statistics, will be soliciting input for updates and additions to the Standard Occupational Classification (SOC) listing for the next formal release. The SOC system is used by all Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, and disseminating data. The SOC is updated every ten years. The last SOC update was completed in 2000.

Recognizing the fleeting window of opportunity to correct disparities in the SOC, NCSL International has joined forces with the American Society for Quality (ASQ) Measurement Quality Division (MQD) to create the Metrology Job Description (MJD) Initiative. To this means, NCSL International established the 163.1 Working Group on Standard Occupational Classifications. Its members, commonly referred to as "the core team" were derived from both NCSL International and MQD constituents.

NCSL International 163.1 Working Group on Standard Occupational Classifications

Jay Bucher - Promega Corporation
Christopher L. Grachanen (Project Leader) - Hewlett-Packard Company
Shawn B. Mason - St. Jude Medical
Gloria J. Neely - US Navy Naval Surface Warfare Center
Graeme C. Payne - GK Systems, Inc.

Don Ruth - US Army TMDE
Howard Zion - Transcat

A Metrology Job Description (MJD) survey has been completed by the MJD core team. NCSL International and ASQ/MQD constituents were notified in September with a broadcast e-mail requesting folks to take the MJD survey. The survey website will remain active until 01 Nov 2005.

The MJD survey is posted at:

<http://www.surveywriter.net/in/survey/survey310/metrology.asp>

Please take the MJD survey so that we can help steer young folks to this rewarding profession.

Disparities in the SOC

At this time I would like to give some background as to how disparities in the SOC first came to light. In 1999, at the prompting of ASQ Fellow Philip Stein, I initiated an effort to create a certification for calibration practitioners known as the Certified Calibration Technician (CCT) program. In preparation for presentation of the CCT program proposal to ASQ’s Certification Board, I queried the SOC to extract information as to the number of folks in the calibration field who would be likely candidates to take the CCT exam (one of the prerequisites for the creation of an ASQ certification is that there is sufficient evidence of eligible candidates in the field for the proposed certification).

I soon learned that the SOC did not have specific job titles for Calibration Technician (Technician, Calibration), Calibration Engineer (Engineer, Calibration) and that job descriptions for job titles closely related to them were inaccurately communicating job expectations. In addition, the job title of Metrologist, though listed in the SOC, referenced a grossly inadequate job description (see below). The following are results of the SOC query of: Calibrator, Calibration, Metrology: Test Technician; Instrumentation Technician, Metrology; and Metrologist listed by 1) SOC job classification number, 2) job title, 3) job title grouping and 4) associated job description:

- 874 51-9061 Calibration checker
- 874 51-9061 Calibration testers
- 874 51-9061 Meter calibrator

Inspectors, Testers, Sorters, Samplers, and Weighers - Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.

- 775 51-2093 Calibrator, exc. repairing
- 775 51-2093 Electrical calibrator
Timing Device Assemblers, Adjusters, and Calibrators - Perform

*Presented at the 2005 NCSLI Annual Conference
Metrology Job Description

precision assembling or adjusting, within narrow tolerances, of timing devices, such as watches, clocks, or chronometers. Exclude "Watch Repairers" (49-9064).

- 743 49-9069 Calibrator, repairing
- 743 49-9069 Hydrometer calibrator

Precision Instrument and Equipment Repairers, All Other - All precision instrument and equipment repairers not listed separately.

- 155 17-3023 Technician, calibration laboratory
- 155 17-3023 Technician, test laboratory
- 155 17-3023 Technician, testing electronic equipment,
- 155 17-3023 Technician, instrumentation
- 155 17-3023 Technician, research instrumentation

Electrical and Electronic Engineering Technicians - Apply electrical and electronic theory and related knowledge, usually under the direction of engineering staff, to design, build, repair, calibrate, and modify electrical components, circuitry, controls, and machinery for subsequent evaluation and use by engineering staff in making engineering design decisions. Exclude "Broadcast Technicians" (27-4012).

- 143 17-2112 Metrologist

Industrial Engineers - Design, develop, test, and evaluate integrated systems for managing industrial production processes including human work factors, quality control, inventory control, logistics and material flow, cost analysis, and production coordination. Exclude "Health and Safety Engineers, Except Mining Safety Engineers and Inspectors." (17-2111).

I was able to estimate a 'ballpark' population from the aforementioned SOC job title demographics which was qualified by expert opinion from senior calibration practitioners/managers from industry and governmental agencies as well MQD and NCSLI constituents. During the course of compiling information from the SOC I learned that the Bureau of Labor Statistics would be soliciting input for updating the SOC in 2005 with a planned formal release in 2010. It was also learned that administrators responsible for the Bureau of Labor Statistics' Occupational Outlook Handbook use the SOC as a guide for directing their efforts.

The Occupational Outlook Handbook is a nationally recognized source of career information, providing valuable assistance to individuals making decisions about their future work lives. The Handbook describes what workers do on the job, working conditions, the training and education required, average earnings as well as expected job prospects in a wide range of occupations. Bureau of Labor Statistics administrators agree that updating the SOC will be the first logical step in assuring the Handbook accurately depicts calibration practitioner occupation information and associated demographics.

In 2004 I proposed a game plan for correcting disparities in the SOC which I presented to NCSL International Board of Directors and MQD officers. The proposal contains the following key elements:

1. Compile job descriptions from U.S. Metrology / calibration industry for calibration Technicians, Calibration Engineers and Metrologists.
2. Identify topics of commonality derived from submitted job descriptions for Calibration Technician, Calibration Engineer and Metrologist.
3. Develop survey items for soliciting input on topics of commonality from U.S. Metrology calibration industry regarding applicability, agreement, etc.
4. Send out survey.
5. Compile and summarize survey results.
6. Generate 3- to 5-sentence descriptive narratives, i.e. job descriptions, from survey results to submit to the 2005 SOC for Calibration Technician, Calibration Engineer and Metrologist.

NCSL International Board of Directors and MQD officers approved the proposal which was later submitted to Professional Examination Services (PES) of New York, NY for administration. PES was chosen based upon a proven track record of success having been instrumental in administering the job analysis survey in the creation of the CCT program. After contacting PES with the proposal they agreed with the concept and submitted the following roadmap:

Step 1. Solicit job descriptions
PES will work with the project leader to identify parameters for soliciting job descriptions from the U.S. metrology/calibration industry for three specific titles: Calibration Technician, Calibration Engineer, and Metrologist. The project leader will disseminate the request for job descriptions. PES will review the submitted descriptions and select up to 25 for each job title, such that they provide broad representation of the metrology/calibration industry in terms of organization type, geographic representation, organization size, etc. If additional job descriptions are needed to fill categories of representation, the project leader will solicit targeted descriptions.

Step 2. Identify commonalities and differences in job descriptions
PES will analyze the selected job descriptions to identify commonalities and differences in the descriptions for Calibration Technician, Calibration Engineer, and Metrologist. PES will prepare a draft summary of the job elements for the three positions and distribute it via e-mail to the core team for review and comment. PES will work with the project leader to finalize the job elements.

Step 3. Develop and pilot test survey
PES will develop and pilot test a brief web-based survey instrument including job elements that may be specific to Calibration Technicians, Calibration Engineers, and Metrologists in order to solicit input from industry representatives regarding the job elements. Ratings for the job elements might focus on uniqueness to Metrology and by whom they are performed. The survey will also contain a demographic background questionnaire and an open-ended comments section. PES recommends that members of the core team nominate individuals to participate in the survey pilot test.

Step 4. Disseminate survey
PES will disseminate a link to the online survey to a sample not to exceed 1000. The project leader will be responsible for providing PES with the e-mail addresses of the survey sample. PES will consult with the project leader to identify the participants.

Step 5. Analyze survey data
PES will compile and summarize the survey results and present them to the core team for review and comment.

Step 6. Generate job descriptions
PES will create 3- to 5-sentence descriptive narratives (i.e. job descriptions) from survey results to submit to the 2005 SOC for Calibration Technician, Calibration Engineer, and Metrologist. PES will circulate the descriptions to the core team for review and comment and incorporate their feedback into revised job descriptions as appropriate. Questions about the MJD Initiative may be sent to: <Chris.grachanen@hp.com>
The summer meeting of the Northern Ohio Section of NCSLI was held on June 23, 2005. Helga Alexander of Keithley Instruments hosted the meeting, and our thanks to both of them for their support of NCSLI, as well as the meeting room and refreshments. Tom Powis, Northern Ohio Section Coordinator and owner of Broadview Instrumentation, conducted the meeting.

After introductions, Richard Roddis of the Fluke Corporation gave a presentation on “Improving Test Ratios With a Reference Multimeter.” He gave some excellent information on utilizing the short-term stability of your laboratories’ reference multimeter as a transfer standard. During the discussion afterward, a point was raised about verification of the math functions available in laboratory multimeters. It was suggested to use a calculator to be sure that both you and your DMM get the same answers.

After lunch, Dilip Shah of E=mc3 Solutions introduced us to Control Charts for Metrology Applications. Calibration generates a lot of data on a lot of test reports in a lot of file cabinets. Dilip spoke of the importance of charting that data and using it to predict equipment failures, perform stability studies, characterize drift and see trends that cannot be seen at the time of calibration. During his presentation he showed examples of the various charts used in metrology, and explained how to both generate and interpret them. Thanks to computers, many of the tools you need are already there in the form of the popular spreadsheet programs.

Before concluding the meeting, Tom Powis sought comments from the attendees about future presentations and topics for discussion. After a short discussion period, the meeting was closed.

Overview: Jeff did a great job presenting the board's directives with the membership. Charles had a wonderful presentation about Eli Lilly’s new laboratory (over 20,000 square feet) with state of the art equipment (some at NIST level). Mike gave a historical account of laboratory development for Bagan and some of the challenges faced by laboratories in the community. Mike presented Bagan’s laboratory technologies and the advances with accreditation and improvements with accreditation.

The open forum brought some new educational tracks for Northern Indiana to fight with “Technician - how do we know they are trained?” CMM technologies with calibration and use?, and the general educational bank in the area. NCSLI can be used through our own networking for answers to some hard questions.

Charles Andrew of Lilly Co is our new Section Coordinator for Central Indiana. A lot of networking occurred. (very productive). We should have some new members come on as corporations or individuals. I will follow-up personally on that outcome. We have hung up the Washington conference posters at local colleges and universities to spark some educational community interest.

Meeting Sponsors:

Richard J. Bagan, Inc.
Agilent Technologies, Inc.
Quametec Corp.
Laboratory Accreditation Bureau

We had our first meeting this year on June 22, 2005. Much preparation went into the meeting with input from orp. describes how they built and operate their metrology programs at Lilly. For his honorarium, Charles was recruited to take over the Central Indiana Section. Welcome to industrial volunteering, Charles.

Attendees:
Ron Miller
John W. Rogers
Wayne Scherry
Michael Christ
Michael Scott
Agilent Technologies
American Electric Power
Ashley Industrial Molding
BAE Systems
Dekko Technical Ctr
Manager of the Lockheed Martin Metrology Laboratory, welcomed the attendees to the facility. He offered a brief summary of the programs supported by the LM STS Metrology Lab at the Orlando, FL, Fort Worth, TX, and La Mesa, Mexico facilities as well as the commercial LM STS Calibration Services division. This was followed by a short video highlighting a few of the programs at LM STS. There were 36 attendees from 20 different companies.


Robert Flynn is a Senior Precision Instrument Sales Specialist for GE Infrastructure, Sensing Division from New Fairfield, CT. Rob provided a short history of GE Infrastructure, starting out as Druck in the late 1960's, acquiring Ruska in 1996 and then GE acquiring Druck in 2002 to become GE Infrastructure. Rob started the presentation by defining Pressure and explaining that pressure is not a fundamental unit of measure.

Pressure is a "Derived" quantity arrived from Force and Area (P=F/A). Rob explained the historical trend of pressure accuracies over the years. In the 1960's accuracies ranged from 0.04% to 0.015A% and by the 1990's the accuracies were ten times more accurate at 0.0015%. Today, 0.0010% may be a requirement. There are several components that affect pressure accuracy, such as the uncertainty of the standards (or source), precision of the transfer standard, the environment/process and the user's training and experience.

A comparison between Absolute, Positive/Negative (gauge), and Differential pressure was shown to explain the differences. The presentation detailed the two different methods of measuring pressure, Direct and Indirect. Direct method would be a dead weight tester, resistance, mechanical deformation instruments, or a liquid column instrument to name a few. The Indirect method would use ionization, thermal conductivity, or viscosity. Common sources for errors are Force (gravity, surface tension), Application (reference plane, leaks) and the Effective Area (piston position, temperature). At the end of the presentation, Rob addressed member's questions and provided additional contact information at GE Infrastructure, Sensing Division.

Mark Tellam, Project Manager, Florida Manufacturing Extension Partnership (MEP), Calibration Training Grants, and assistance.

Mark Tellam is the Florida Manufacturing Extension Partnership (MEP) Technology Transfer and Commercialization Project Manager. Mark’s responsibilities include support efforts utilizing grants to build research partnerships in Florida’s High Tech Corridor. The Florida MEP, an affiliate of NIST, is engaged in training many businesses to develop such standards, and generally tries to defray the cost of this training through the use of grants.

Mark has been focusing on the use of Florida High Tech Corridor Council External Matching Grants, to cover up to half the cost of work being done by regional businesses who leverage laboratories and faculty at USF and UCF. An example would include a very high temperature sensor development effort (USF) that was presented to NIST last year, for controlling industrial processes for semi-conductor devices. The Florida MEP also works with other state’s MEPs through a common management team, which facilitates the use of grants, and such engagements may include metrology training for supply chain partners for DOD primes.

Mark explained numerous types of grants available and how a company can apply. There was a great deal of interest by the members and Mark answered many questions from the members. Mark’s presentation provided insight on a topic that many of the members were not aware was available or how a small company could apply for a training grant.

Randy Fowler, Fluke Corporation, “Uncertainty Estimation, and Impact on TMDE.”

Randy Fowler is the Eastern Region and Government sales manager for Fluke Corporation. Randy presented a paper titled "Uncertainty Estimation." The presentation started off with a short overview of uncertainty estimation, followed by Randy explaining that uncertainties are estimated and based on three methods, Probability Theory, Curve-Fitting Techniques and Experience.

The presentation explained the two types of uncertainty and the definition of each. Type A is evaluated by Statistical Methods and attributable to Random Effects, while Type B is evaluated by other means and may be attributable to Systematic Effects. The stages of uncertainty analysis were discussed and why results may vary. Randy's presentation also provided an overview of statistical analysis, Normal Distribution, Standard Deviations, types of Type A and Type B contributions, Simple Curve-Fitting, and expanded uncertainty for K=2. The members were very impressed with Randy's presentation and a list was generated requesting copies.

Georgia L. Harris, NIST, Weights & Measures Division, Metrology Training

Georgia is the Group Leader, Laboratory Metrology Group at NIST Weights and Measures Division. Georgia is also NCSLI Operations Vice President, Committee 160 -Education and Training. Georgia has overseen the NIST metrology training, proficiency testing, laboratory recognition activities in support of the states weights and measure laboratories for the past 15 years.

Georgia gave a brief discussion about the Working Group draft of the Z540.1-1994 (R2002) document. Her next topic was NCSLI Education and Training. NCSLI vision is to promote competitiveness and success of NCSLI International members by improving the quality of products and services through excellence in calibration, testing and metrology education and training. Courses are available at the Boulder, CO Training Facility.

Joe Patchett, Metrologist, Lockheed Martin STS

Joe Patchett toured the group through the various Metrology Laboratories at the facility and answered questions related to capabilities, uncertainties, and commercial calibration services available to customers.

We would like to give special recognition and thanks to Ralph Giffin, V.P., Operations, and Bart Hynes, Manager, Test Assurance for sponsoring this conference. Their continued support and encouragement of the Lockheed Martin STS Calibration Services and involvement with NCSLI International is the primary reason our Metrology team continues to develop and grow to meet the stringent demands of our customers.
Isn't this the way you picture Florida? A calm, tropical setting, relaxing lagoon outside the business building, just enough to keep you from working too hard?

---

**Topic: Flow Measurement and Calibration**

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

Casey spoke about Primary and Secondary Flow Systems. Primary Systems are traceable through Mass, Length, and Time. The following are examples of a Primary Flow System:

Gravimetric - direct mass measurement (weighed before and after)

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

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

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

---

**Topic: Machine Tool Calibration**

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

Keith Summers talked about the seven tests that the Laser measures. They are Linear, Angular, Straightness, Flatness, Rotary, Dynamic, and Diagonal tests. He then explained the set up for each. The Linear test uses a stationary reflector and beam splitter and a moving reflector. The Angular test uses a stationary interferometer and a moving reflector. The Straightness test uses a moving wollaston prism and a stationary straightness reflector. Finally the Diagonal test uses an interferometer that measures the linear positioning accuracy of the machine as it moves along each of its four body diagonals in turn.

Next, Tom talked about the benefits of using a Ballbar as an interim test to check performance in between the calibration interval. The Ballbar test is used to diagnose all common machine errors, advises...
on possible causes and remedies, and can be used as part of a planned maintenance program. It can also be used as an early warning of potential problems and can reduce machine downtime. The last part of the presentation consisted of talking about the analyzing of the data. The first part of analyzing the data is to be aware of the 21 degrees of freedom, 3 squareness, 6 straightness, 3 roll, 3 pitch, 3 yaw, 3 linear. Tom stated that they use the Renishaw Laser 10 software to analyze Slick-slip, Squareness, Cyclic Error, Scale, Servo mismatch, Backlash, Reversal spikes, Lateral play, and Straightness.

**Speaker:** Walter Nowocin - Medtronic

**Topic:** Featured Lab

**Speaker:** Kevin Bull - Veriteq Instruments Inc.

**Topic:** Humidity

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

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

The second method is divided flow, which uses saturated air and dry air that are mixed to create the desired RH. The problems for this method are different temperatures of the air stream, poor uniformity, and effects from external temperature fluctuations (HVAC). The third method is using saturated salt solutions, which use the physical properties of salt in a saturated water solution. This method is difficult to maintain consistent RH levels, degrades over time, and can cause corrosion and contamination of the instruments. The fourth method uses a two-pressure system. The two-pressure system is commonly used as a primary standard because of its high accuracy. The two-pressure system measures the ratio of pressures: RH = Pc/Ps. Kevin mentioned to make sure you use a two-pressure system without a window to reduce the temperature gradients in the chamber.

**Speaker:** Dilip Shah - E = mc3 Solutions

**Topic:** Proficiency Testing

Dilip started out by asking the question: "What is proficiency testing?" From ISO Guide 2 it is "determination of laboratory testing performance by means of interlaboratory comparisons". He also listed the flowing standards that are related to proficiency testing: ISO Guide 43 parts 1 and 2, ASTM E1301, ASTM E691, NCSLI RP-15, and ISO 5725 parts 1-4. Next he talked about why laboratories should participate: To establish confidence and as a demonstration of accreditation. To help the customer decide if the laboratory meets its measurement, calibration and testing requirements. To serve as a measure to ensure that the laboratory continuously meets its quality requirements.

Another reason to participate, if you are trying to obtain ISO 17025 accreditation, states "The laboratory shall have quality control procedures for monitoring the validity of tests and calibrations undertaken." 5.9b states "participate in interlaboratory comparison or proficiency-testing programmes." He described three proficiency testing schemes, which are the following:

**Measurement Comparison Scheme:**

"Artifact is circulated between participating laboratories
"National Lab provides the reference value
"Laboratories follow a pre-determined process
"Data is collected and published with appropriate statistics

**Interlaboratory Testing Scheme:**

"Homogeneous material is split among the labs and tested under agreed-upon conditions
"Test data is sent to the proficiency testing coordinator
"Material has an "assigned value"
"Assigned value can be derived from the data

**Split-Sample Testing Scheme:**

"Compares the performance of a particular laboratory
"Splits the homogeneous sample material or circulates a known value artifact
"Test data is sent by the laboratories and analyzed by the customer to select a particular laboratory's services

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

"Mean
"Standard Deviation
"Range (range can be a good estimator of variability)
"Statistical significance using z, t or F tests
"Analysis of Variance (ANOVA)
"Gage Repeatability & Reproducibility
"Confidentiality of the laboratories must be maintained when the data is reported publicly

"The testing coordinator should maintain neutrality and report data in an unbiased manner

"Laboratories should ensure that their processes are in statistical control before participating in the proficiency testing program

"Participating labs should have a good training program

"The participating labs should have documented measurement uncertainty budgets and analysis

"Participating labs should use controlled procedures
Shawn continues to turn out impressive numbers of attendees. Kudos and 3 Attaboyos.

Attendees:
Jim Ek
Mike McDonald
Dennis Paulson
Terry Confer
Sena Lamin
Jeff Otto
Silverio Meza
Jay Killian
Harry Spinks
Kevin Knut
Tom Kegel
Greg Urban
Mike Fleischer
Mitch Johnson
Roger Zematis
Dillip Shaw
Pat McGillis
Wayne Cummings
Doug Erickson
Don Howard
Daniel Lautz
Larry Roden
Stacy Frazewa
Scott Martell
Craig Snitker
Gary C. Meyer
Scott Herdine
Rick Brion
Robert Bohrer
Doug Burch
Ruel Carpentier
Thomas Clark
Chris Hebert
Derrick Hentz
Dave Ludwig
Gregory Mijing
Walter Nowocin
Curtis Scheible
Julie Grangroth
Keven Johnson
Dave Kreitlow
Bill Moyer
Tia O’Neil
Bob Rimer
Kevin Rust
Jim Grootman
Jason Barto
Carl Clusmore
Paul Scarpuri
Dan Vanderveen
Jane McDonsoll
Greg Anderson
Doug Binning
Keith Sansers
Tom Tremmel
Jon Earl
Randy Ward
Shawn Mason
Mike Czech
Sue Marotte
Gary Martz
Bruce Adams
Carol Heckert
Walt Kendall
Ivan Shepard
Terry Stremsha
Cindy Jensen
Norm Nevisan
Jim Dalezal
Kevin Bull
3M Center Calibration Lab
3M Center Calibration Lab
3M Center Calibration Lab
3M Corporate Metrology Lab
3M Corporate Metrology Lab
Alliant Technosystems
Andersen Corp
Boston Scientific
Calmetrics
Cesi
Computype
Donaldson Company
Donaldson Company
Drylon Instruments
EMC3
Fotional Co Lab
Fluke Corporation
General Dynamics
Goodrich Corp - Sensor Sys Div
Goodrich Corp - Sensor Sys Div
Guidant
Hutchinson Technology
Hutchinson Technology
Hutchinson Technology
J&G Technology
Lockheed Martin
Martin Calibration
Medtronic
Medtronic
Medtronic
Medtronic
Medtronic
Medtronic
Medtronic
Medtronic
MTS
MTS
MTS
MTS
MTS
Mueller Sales
NMC/CO
Northwest Airlines
Northwest Airlines
Precision Repair & Calibration
Productivity Quality
Productivity Quality
Productivity Quality
Productivity Quality
Protein Design Labs
Nitro
St. Jude Medical
St. Jude Medical
St. Jude Medical
State Of MN - Wts & Meas
State Of MN - Wts & Meas
Trans Co
Trans Co
Trans Co
Truth Hardware
Truth Hardware
United Standards
Verteq

July 28, 2005
3M Austin Center
Austin, TX
D. Keith Scoggins
South Texas Section Coordinator

The NCSL International South Texas Section summer meeting was held on July 28, 2005 at the 3M Austin Center in Austin, Texas. The meeting was hosted by Roke Sumbillo, 3M Austin Center metrology laboratory supervisor and was conducted by Keith Scoggins, the South Texas Section coordinator and metrology laboratory supervisor at the South Texas Project Nuclear Operating Company.

Keith Scoggins made some opening comments and welcomed everyone to the meeting. He also requested feedback from the attendees on what subjects they would like to see presented at future section meetings.

Roke Sumbillo presented to the attendees an overview of the 3M Austin Center and a photo/video tour of the facilities. After Roke’s presentation, Terry Conder, NCSL VP Central US, and metrology manager at 3M Center Corporate Metrology Services - St. Paul, presented an overview of the 3M facility in St. Paul.

Keith Bennett, from Transcat, presented several interesting issues that calibration service providers should consider when talking to their customers. Keith’s central theme was, “The customer doesn’t always know what to ask for” therefore, the calibration service provider must ask questions to determine the customer’s needs. If you don’t ask the right questions, you may have a disappointed customer.

The last speaker of the morning was Sammy Pizzo, from National Instruments. Sammy gave a presentation on “Implement a Flexible Automated Calibration Framework.” Sammy described the advantages of a flexible framework and how instruments within a calibration cluster can be changed out with no additional programming required.

A wonderful southwestern-style lunch was provided by our host, 3M.

After lunch, Bill Byron, from Tektronix, provided a very interesting presentation titled “Introduction to Real-Time Spectrum Analysis.” Bill demonstrated how we can now make real-time measurements using a modern spectrum analyzer.

Next Wayne Cummings, from Fluke Corporation, gave an enlightening and highly fascinating presentation on “Monitoring the Performance of Laboratory Standards.” Wayne provided suggestions on how laboratories can use their own standards to monitor the performance of their other standards to improve measurement confidence.

The next speaker of the day was Doug Lynde, from On-Time Support. Doug gave an overview of METDaemon, a new applica-
tion server software package that is designed to execute on the server hosting the metrology database, and accepts connections from a variety of (configurable) sources and provides data from the metrology database to those sources. Doug said "METDaemon is a server-based software application that provides an "abstracted" interface to a metrology database."

The last speaker of the day was Miguel Decos, from NASA-JSC-Wyle Labs. Miguel provided a presentation titled "Meeting Customer's Complicated Reports Requirements". Miguel described several methods that can be used to meet customer reporting requirements.

In addition to the above speakers, there was an exhibit area where several local vendors were allowed to show their products and services. During the breaks and lunch the vendors were available to discuss and demonstrate their products with the attendees. Comments from the attendees and vendors after the meeting were very positive and they would like to see additional vendor participation at future meetings.

A tour of the 3M Austin Center metrology laboratory facilities was offered to all attendees.

A special thanks to Roke Sumbillo, 3M Austin Center metrology laboratory supervisor, for his support in providing for the meeting location, refreshments, and lunch. An enthusiastic "thanks" is extended to the vendors that supported the mini-show to make this meeting such an immense success.

**INTERNATIONAL REPORT**

*Malcolm Smith, V.P.*

Jeff Gust attended the EUROMET General Assembly in Bulgaria. Klaus Jaeger attended the Metrologie Conference in France.

Malcolm reported that we were developing long-term relationships and was anticipating sending the same person to a meeting to develop continuity.

**Jeff Gust - EUROMET**

Harry Moody - EUROLAB
Steve Stahley - SIM
Tony Anderson - ILAC

We are in the early stages of discussions with IMEKO. They seem receptive to a peer-to-peer association. The 2006 IMEKO Conference is in Brazil.

We had early discussions with the South African National Laboratory Association and the accrediting body SANAS.

Key players involved in International activities to date:

Klaus Jaeger (emeritus)
Harry Moody - Europe
Charlie Motoko - Mediterranean
Steve Stahley - SIM
Tony Anderson - ILAC

**Attendees:**

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keith Scoggins</td>
<td>STP/NOC</td>
</tr>
<tr>
<td>Tony Conder</td>
<td>3M</td>
</tr>
<tr>
<td>Roke Sumbillo</td>
<td>Wyle Labs</td>
</tr>
<tr>
<td>Trevor Johnson</td>
<td>National Instruments</td>
</tr>
<tr>
<td>Scott Saniti</td>
<td>Tektronix</td>
</tr>
<tr>
<td>Elena Marron</td>
<td>Tektronix</td>
</tr>
<tr>
<td>David Garza</td>
<td>Transcat</td>
</tr>
<tr>
<td>John Curcurato</td>
<td>Transcat</td>
</tr>
<tr>
<td>Vinh Duong</td>
<td>Fluke</td>
</tr>
<tr>
<td>Miguel Decos</td>
<td>STP/NOC</td>
</tr>
<tr>
<td>Sammy Pizano</td>
<td>GC</td>
</tr>
<tr>
<td>Jeff Edwards</td>
<td>GC</td>
</tr>
<tr>
<td>Bill Byrom</td>
<td>GC</td>
</tr>
<tr>
<td>Keith Bennett</td>
<td>GC</td>
</tr>
<tr>
<td>Mike Sublett</td>
<td>GC</td>
</tr>
<tr>
<td>Wayne Cummings</td>
<td>GC</td>
</tr>
<tr>
<td>Steven Rice</td>
<td>GC</td>
</tr>
<tr>
<td>Doug Sexton</td>
<td>GC</td>
</tr>
<tr>
<td>Todd Barnaby</td>
<td>GC</td>
</tr>
<tr>
<td>Dave Upton</td>
<td>GC</td>
</tr>
<tr>
<td>Chris Franks</td>
<td>GC</td>
</tr>
<tr>
<td>Mike Riggs</td>
<td>GC</td>
</tr>
<tr>
<td>Dave Sanders</td>
<td>GC</td>
</tr>
<tr>
<td>James Riley</td>
<td>GC</td>
</tr>
<tr>
<td>Larry Mock</td>
<td>GC</td>
</tr>
<tr>
<td>Kelly Oppliger</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>David Trate</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Joe Garza</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Al Platt</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Oralia Avalos</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Chris Kengle</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Erastia Kengle</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Marc Hallace</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Ken Solyn</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>David Kimbell</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Maura Navarro</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Dave Carter</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Doug Lynde</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Jason DeGroat</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Jeffrey Narvae</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Dewanye Curtice</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Brad Bell</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Ronnie Eubanks</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Walt Cottler</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>William Stone</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Ronald Boone</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Jose Mendoza</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Jim Greenwood</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Greg Jurans</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Ken Friesenbahn</td>
<td>Freescale Semiconductors</td>
</tr>
<tr>
<td>Virgil Tichothe</td>
<td>Freescale Semiconductors</td>
</tr>
</tbody>
</table>

**International Activities:**

Klaus Jaeger (emeritus)
Harry Moody - Europe
Charlie Motoko - Mediterranean
Steve Stahley - SIM
Tony Anderson - ILAC

**Key players involved in International activities to date:**

Klaus Jaeger (emeritus)
Harry Moody - Europe
Charlie Motoko - Mediterranean
Steve Stahley - SIM
Tony Anderson - ILAC
COMMITTEE NEWS

STANDARDS POLICY
Doug Sugg, VP.

U.S. MEASUREMENT REQUIREMENTS
Jeff Walden

The USMRC sponsored a Panel Session for the Workshop & Symposium in August titled, "The Calibration Paradigm in the Year 2020."

Panel Members were:
1. Caroll Brickencamp, The Pi Group, "Developing Strategies for the Technologies of Tomorrow";
2. Marc Desrosiers, NIST, "NIST Services for e-Traceability to Ionizing Radiation National Standards";
3. Mladen Jakovic, Croatian Metrology Society, "Various views on calibration";
4. Dennis Swyt, NIST, "Changes and Challenges to Dimensional Metrology in 2020";
5. Istvan Zoltan, Budapest Univ. of Technology & Economics, "Self-Managing Instruments";
7. Chet Franklin, CSC, acted as panel moderator.

The website abstract stated the panel's primary question as, "Can we identify the calibration paradigm that will be in place in fifteen years?" Panelists and members of the audience all agreed that the measurement community would be experiencing a major shift in that paradigm.

The session was well attended with over sixty-five people present. The panel members were enlightening and there was a good amount of very stimulating discussion. Many felt that we had only scratched the surface and more discussion would be helpful.

The committee wishes to thank Dick Pettit for having us on the program, the panelists for their expert contributions, and all the attendees for their attention, active participation and tolerance with the delays due to technology quirks.

The committee meeting was held on Wednesday, and had a light but active attendance. The discussion was centered on the survey - a new survey will be on the NCSLI website soon - and ways to make the committee more effective in fulfilling its charter. It was agreed that the survey response process need improvement. Chet Franklin took the action to pursue improvement.

Attendants:
Chet Franklin Computer Sciences Corporation (CSC), Norco Operations
Jose Gonzon NSWC Corona
Doug Leonard Laboratory Accreditation Bureau (LAB)
Ron Ginley NIST
Tom Zuberl Cannon Instruments
Li Pi Su US Army Primary Standards Laboratory (USAPSL)

The committee is also looking for new members; anyone who is interested (either in being a member or just with a contribution) can contact Jeff Walden at <Jeffrey.Walden@navy.mil>, or Chet Franklin at <cfranklin@cscnorco.com>. For more information regarding the U.S. Measurement Requirements Committee go to <www.ncsli.org>, click on Committees and go to 131.

CANADIAN MEASUREMENT REQUIREMENTS
Dave Stevens
Lorraine Yeomans

Dave Stevens was contacted April 19, 2005 and he stated that the Canadian Measurement Requirements Committee has been inactive.

GLOSSARY AND ACRONYMS
Emil Hazarian

The words fly away, the writings remain
(Verba volant, scripta manent)

Conference report:

So many words, so little definitions...and time. For the three months before the Washington DC NSCLI Workshop and Symposium, the Glossary Committee collected new entries and comments on existing ones for the new edition of the Glossary and Acronyms of Metrology and Metrology Associated Terms (GAMMAT). We were pleased with the response, although it was taking more time than expected. There were more than 177 new terms proposed from more than 24 professionals spread in three continents. After the glossary committee meeting, the proposed number of new entries rose to more than 220.

The main topic of the meeting was the selection and retention process of the new entries. Due to this large volume of proposed words this process will take longer than expected.

Other topics discussed were related with:

Include U.S. Navy metrology definitions mandated by NSWC Corona, Measurement Science Department;

Include software related terms in GAMMAT;

New GAMMAT entry: equipment specifications, proposed by Suzanne Castrup, Integrated Science Group; also other terms used in the company's uncertainty program will be incorporated;

Electronic availability of the glossary draft with a certain degree of interaction, proposed by Herb O'Neil, Ridgewater Community College;

Harmonizing the terminology within NSCLI created documents, by checking the electronic copies of the RPs in progress;

Include an explanatory note on the entries presentation format and selection, suggested by Mariana Buzduga, Scantek, Inc.

Answering inquiries: for the last couple months I was also able to help with metrology definitions acquired via e-mail or telephone, a
new feature in development of our committee. Please feel free to ask metrology and metrology-related terms definitions. We will make every effort to provide reliable definitions and sources.

Accelerated by inquiries and by the Board of Directors, I am looking at putting together a reference list of relevant documents, dictionaries, etc. with metrology terms. If you know any document containing metrology or metrology-related terms and definitions, old or new, and especially in electronic format, please contact me with the information, to be added to the list.

LEGAL METROLOGY
Val Miller

A good attendance at the conference meeting of Legal Metrology.

Conference report:

Val expressed his appreciation for making this a standing committee. At their meeting they presented the survey they had conducted this year and Val made copies available at the Board meeting. They have started planning for next year’s meeting and there has been interest expressed in doing training about how legal metrology systems in the North American Free Trade Association Region (NAFTA) are constructed. As part of their meeting they also received an update from George Rodriguez on the ASTM activities and Chuck Ehrlich on OIML.

The papers presented were:

L.F. Eason, North Carolina Standards Laboratory, presented: "Gravimetric Calibration of Volumetric Standards With Capacities Exceeding Five Gallons;"

Elizabeth Gentry, Oklahoma Standards Laboratory, presented: "2005 State Laboratory Program Workload Survey;"

Jeff Gust, Quametec, presented: "Development of a Proficiency Testing Quality System for U.S. Legal Metrology Laboratories."

The 2005 State Laboratory Workload Survey has been completed with 100% of the active laboratories participating. Committee members, Ken Fraley and Elizabeth Gentry (OK), L.F. Eason (NC), and Steve Sumner (NM) performed the primary assembly of the report which will be presented during the 2005 Conference. Publication of the report is being funded by the NIST Weights and Measures Division. Survey participants and coordinators have reported that participation of the NCSSLI in the bi-annual survey made this the smoothest survey thus far.

There has still been no activity on the proposed updates to ASTM standards, E319, E898, E1270 and E617 on which the Legal Metrology Committee members had agreed to work. Dr. George Rodriguez, E41.06 committee chair, is scheduled to meet with the committee on Sunday, August 7, to discuss plans for formation of working groups to review and update ASTM E617 and E898. It is hoped that work on these standards will be accomplished during this Conference cycle.

********

MEASUREMENT SCIENCE & TECHNOLOGY
Richard Pettit, V.P.

Technical Program Chair Activities:

I completed review of all assigned papers and input ratings into web system. Suggested several changes to the best paper rating process and awards system to both Doug Sugg and Jeff Gust.

AUTOMATIC TEST AND CALIBRATION SYSTEMS
Bill Kotzky
David Seaver

The Automatic Test and Calibration Systems (ATCS) Committee met at the 2005 NCSLI conference in Washington, DC.

Attendees: Ed Culpaz NSWC Corona
Bob Kilgore Northrop Grumman Sereal
Bill Kotzky Teradyne, Inc.
Mark Nelson Syrris Test and Measurement
Tim Osbourne Dynamic Technology, Inc.
Sammy Pizzo National Instruments
Andy Senkenwich CDA Torque Products
Bob Stern Agilent Technologies
David Wren NSWC Corona

The committee reaffirmed the mission to produce a NCSLI recommended practice (RP) dealing with the validation of software for ATCS. Using lessons learned that were presented in a paper given at the conference detailing the development of the ASQ Metrology Handbook, the committee defined the target audience and the coverage. The time frame for the production of the document will be decided at the next meeting, which will be a virtual meeting.

Another important issue that was discussed was the place for an uncertainty discussion or review in the document. As part of Bob Kilgore’s assignment from the last meeting, he presented his review of software safety for the project.

The next step for the team will be to work with NCSLI to secure resources to store reference material produced by the group and set up a communication process for the RP development and future virtual meetings.

The following assignments have been made:

- Safety: Bob Kilgore
- Test Uncertainty: Bob Stern
- Design Requirements: Dexter Shelton
- Different methods of validation: Bill Kotzky
- Validation of Software: Ed Yankajtis

MEASUREMENT COMPARISON PROGRAMS
Jim Wheeler & Al Ternel

The committee met at the 2005 NCSLI Conference.
The committee has updated RP-15 "Recommended Practice for Interlaboratory Comparisons" and the revised document has completed editorial review by the Publications Oversight Committee. Next it was recently sent to the full committee for their review and comments. In addition, Bob Watters, NIST, has completely updated all figures in the document. Many thanks to Bob for providing this service to the committee.

Jay Klevens, Process Instruments Inc., is developing a high resistance Interlaboratory Comparison (ILC). The location of a NMI calibration source with the combination of low cost and adequate uncertainties is being investigated. This group had an organizational meeting at the 2005 NCSLI Conference.

There will be an organizational meeting for all parties interested in participating in a UV Round Robin. Tom Larason, NIST, is very interested in starting this ILC but currently does not have the time to devote to the startup process. However, if others are interested, they can get this ILC going. This group had an organizational meeting at the 2005 NCSLI Conference.

INTRINSIC & DERIVED STANDARDS
David Deaver

Conference report

Attendees:
David Allen
David Deaver
Chuck Ehrlich
Wes England
Bill Ginley
Clark Hamilton
David Krulak
Bill Miller
Stan Pond
Ruben Salazar
Larry Tarr
Yi-hua Tang

Boeing - Utah
Fluke
NIST - Gaithersburg
U.S. Army - Redstone
NIST - Boulder
Vnetris
Sandia
Lockheed Martin - Denver
Pond Engineering
Boeing - Seattle
U.S. Army - Redstone
NIST - Gaithersburg

IDSC Catalog Updates

• Definition of Intrinsic Standard is being revised in the VIM committee but hasn't come up for discussion yet. We will stay with the current definition until VIM solidifies. Chuck Ehrlich will be our advocate on the VIM committee for a definition to be the same or similar to the IDSC one.
• We reviewed the definition of Derived Standard. Dave Deaver will solicit input as to whether it needs to be updated.
• The standards listed need to be reviewed for currency, references, and RISPs and RPs added to the references.
• 2 Temperature 2 Pressure humidity standard needs to be added
• Triple point of argon needs to be added

Deadweight Pressure RISP - David Allen, Ruben Salazar

• The document has been converted to Word.
• The editors have changed the document to the new format.
• The RISP will have separate sections for calibration and use. The editors have had some heartburn about this in the past because there is some duplication of text. However, for clarity, the RISP committee wants to have the separate sections.
• Some of the editors’ comments were made to earlier revisions of the document, not the latest.
• There is still an issue of getting the figures, which were originally created in Autocad, into the TIF format required by NCSLI.
• The committee expressed concern that TIF may be a very poor choice for a graphics standard and encourages NCSLI to review having it as the standard graphics format.
• Ruska has agreed to create new figures for those that are no longer available electronically. However, the person assigned may no longer be available.

Triple Point of Argon RISP - Stan Pond

• Uncertainty section has been completed
• Published in the Temperature Symposium this year
• Has been reviewed by Greg Straus (NIST)
• Will consider another peer review if someone is available

Two Temperature Two Pressure Humidity RISP - Bob Hardy

• Adding section for moisture uncertainty
• Thunder Scientific is helping fund the uncertainty analysis

2005 Josephson Array Intercomparison - Yi-hua Tang, David Deaver

• Yi-hua Tang presented the 2005 ILC structure and preliminary results to the subcommittee and in a paper at the 2005 NCSLI conference.
• NIST Gaithersburg is the pivot laboratory.
• The ILC is broken into 4 loops each having a sub-pivot laboratory
• Yi-hua is traveling to each sub-pivot laboratory with the NIST Portable JJ system.
• The sub-pivot laboratory then sends the traveling Zener references on a loop of 2-3 labs.
• The sub-pivot lab measures the Zeners again at the end of the loop.
• The Zener references are then sent to the next pivot laboratory.
• Loops 1, 2 & 4 have been completed; Loop 3 was delayed and is being restarted due to shipping issues which resulted in the Zeners going cold. This also required a 5th sub-pivot lab to be recruited. NIST agreed to support the additional comparison with Yi-hua and the portable JJ.
• Labs desiring to do so will be allowed to repeat their results, probably in comparison to a sub-pivot laboratory.
• The Navy had to dis-assemble the reversing switches and clean the metal particles from them to get good reliability.
• Results should be published at NCSLI and CPEM in 2006 and in IEEE Transactions 2007.
• NCSLI certificates of participation and results will be issued.
• The attendees of the subcommittee meeting re-affirmed the 3-year interval so the next ILC is scheduled for 2008.
• Some labs submitted extra data. For 2008 it was suggested labs may submit extra data if desired but must specify which data are to be used for the comparison.
• For 2008, it was suggested the participants consider a participation fee to help offset at least some of the NIST expense of participation.

Opportunities

• Guidelines for industrial thermometers

Several reports are in process, including: "Revision to the Catalogue of Intrinsic/ Derived Standards: "Argon Triple Point Cell RISP": "Platinum Resistance Thermometer Handbook:" Revision to the Pressure RISP (see below); and Bob Harding has finished developing an additional humidity uncertainty example - he has been supported by Thunder Scientific for this activity.
Committee News

The Josephson Volt ILC has begun. Unfortunately the standards were held up at the US/Canada border and the batteries died. Therefore, the remaining labs in this measurement loop could not participate. After the Zener’s batteries were recharged, the next set of labs was begun. The missed labs will be included in a separate loop. NIST is using their new portable Josephson Volt system to monitor the standards at three selected pivot laboratories.

The group had a committee meeting at the 2005 NCSLI Conference. The JJ ILC Organizing Committee consists of the following five members: Dave Deaver, Fluke; Clark Hamilton, Vmetics; Harold Parks, Sandia; Yi-hua Tang, NIST; and Barry Wood, NRC.

Ruben Salazar, Boeing, is heading up a working group that is in the process of revising the Dead Weight Pressure RISP-4. The document was re-formatted and sent to the Publications Oversight Committee for editorial review; the editorial review has been completed. Recently the revised/edited document was sent to working group members for their comments. The working group discussed this document at the conference meeting. Ruska is assisting with the development of new, updated figures. The meeting agenda included reviewing the edited version of RISP-4, reviewing action items from the committee meeting held at MSC 2005, and discussing Dave Allen’s initiative to split RISP-4 into two information manuals.

CHEMICAL METROLOGY
Burt Sutherland

Burt Sutherland attended the 2005 PITTCON Conference and continued the process of identifying new members for the committee and developing future goals for the committee. He held a committee meeting at the 2005 NCSLI Conference.

DIMENSIONAL METROLOGY
Jim Salsbury

Conference Report:

After many informal and unofficial meetings over the past few years at various metrology conferences, the dimensional committee had their first official meeting during the 2005 NCSLI conference in Washington, DC. With a turnout of over 20 people, the discussion was centered on the mission of the new committee.

One of our primary goals of the committee is to increase dimensional metrology activity within NCSLI. The committee will help NCSLI increase the number of dimensional metrology technical sessions at the annual conference and help promote those sessions. The committee set a 2006 annual conference goal of five technical sessions and two tutorials in dimensional metrology and an increase in the number of exhibitors from dimensional metrology equipment manufacturers. The committee also wants to help increase the attendance at the dimensional sessions. To achieve these goals, the committee established a smaller task force of committee members to organize and lead the new efforts.

The following were in attendance at the committee meeting:

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eugene Wang</td>
<td>Technology</td>
</tr>
<tr>
<td>Ryan Fischer</td>
<td>Semiconductor Manufacture</td>
</tr>
<tr>
<td>Ed Pritchard</td>
<td>International Corporation</td>
</tr>
<tr>
<td>Jim Henry</td>
<td>Laboratory Accreditation Bureau</td>
</tr>
<tr>
<td>Eric Stanfield</td>
<td>Western Environmental Corporation</td>
</tr>
<tr>
<td>John Stoop</td>
<td>Hexagon</td>
</tr>
<tr>
<td>Ted Diston</td>
<td>NIST</td>
</tr>
<tr>
<td>Hy Tran</td>
<td>Sandia National Laboratory</td>
</tr>
<tr>
<td>Andre Claudet</td>
<td>Sandia National Laboratory</td>
</tr>
<tr>
<td>Doug Cooper</td>
<td>TAC</td>
</tr>
<tr>
<td>Wayne Logue</td>
<td>Pratt and Whitney</td>
</tr>
<tr>
<td>Curtis Ashford</td>
<td>Boeing</td>
</tr>
<tr>
<td>Mark Lapinkes</td>
<td>Sypris Test and Measurement</td>
</tr>
<tr>
<td>Shawn Mason</td>
<td>St. Jube Medical</td>
</tr>
<tr>
<td>Ed Morse</td>
<td>UNC Charlotte</td>
</tr>
</tbody>
</table>

As reported in the last newsletter, the committee has also identified a need for an NCSLI recommended practice (RP) in the calibration of coordinate measuring machines (CMMs). This was also discussed during the committee meeting, and the committee established a goal for finishing this RP by the 2006 NCSLI annual conference. The committee decided to plan annual meetings at the NCSLI annual conference but that most of the committee work could be accomplished without planning additional meetings.

Dimensional Standards Update:

One of the missions of the dimensional committee is to keep NCSLI members informed of developments in dimensional standards. The only news to report this quarter is the schedule of upcoming meetings:

ASME B89: October 5-7, in Denver, CO
ISO TC213 (all working groups): January 10-18, in Charlotte, NC

********

INDUSTRIAL PROGRAMS
Roxanne M. Robinson, V.P.

HEALTHCARE METROLOGY
Dave Walters

Conference Report

Three healthcare sessions were held during the NCSLI International workshop in Washington D.C. In attendance were over fifty members comprised of technicians, engineers, managers, suppliers, validation consultants and a member of the FDA.

Of special interest were presentations:
"Clearroom Standards" & "Calibration Benchmarking Study" (Results of 10 independent healthcare companies)
Robert Mielke - Abbott Principal Metrology Engineer & IEST Fellow

"Vendor/Supplier Expectation & Special Healthcare Problems" Mark A. Edlinger - Metrology Manager Abbott Bio-research Center

Healthcare Committee members decided that the NCSLI RP6 "Calibration Control Systems for the Biomedical and Pharmaceutical Industry, May 1999" should be updated. The process has officially begun. The project will be lead by Jun Bautista,
Quality Director of Metrology at Genzyme. The changes will be recommended prior to the 2006 committee meeting.

To better benchmark calibrations in healthcare metrology laboratories, Abbott Laboratories Global Metrology Laboratory has volunteered to act as the pivot lab and data reduction facility for a temperature round robin. A conductivity round robin will also be offered. The first 10 healthcare companies for each will be accepted.

UTILITIES
Peter Buzzard

A superb turnout for the Utilities Committee at the conference. I wonder if they have a theme song. “I am a lineman for the county?”

EQUIPMENT MANAGEMENT FORUM
Rob Parchinski

Smitty (James Smith) gave an oral report. Boeing has recommitted to support Rob Parchinski internally with help to assure that Boeing remains in the group. In the past, they had targeted three RPs to review and develop.

One group has already started on an RP for specification standardization that has been brought into the purview of this committee. The committee also has a beginning draft RP for delayed dating. The goal is to have the delayed dating RP in editorial review by the end of the year. They have committed to set up a meeting at the Measurement Science Conference next March. They believe that the EMF acronym is perhaps not the best and have renamed it the TEAM Forum - Test Equipment Asset Management Forum. The third document is a RP on shipping and handling of measurement and test equipment.

Roxanne said she has been approached to form a subcommittee under 155 to focus on equipment specifications. The purpose would be to collect manufacturer's specifications and post them on a website to be available to laboratories and to write an RP to describe what laboratories and testing facilities should be expect when reviewing these specifications. Larry Nielsen added that the group would like to develop a software definition for exchange of specifications and the group was started by Alex Lepak from Israel.

AIRLINE METROLOGY
Victor Cleland, now Joe Cebulski

Victor is stepping down as chair and has found his replacement, Joe Cebulski. There was discussion of a gap analysis of the FAA document 145 9AC to ISO17025, and the status of the revision to ANSI-Z540. There is interest to conduct another ILC on mercury manometers, and a team was assigned to move that forward. Our next meeting will be at the Measurement Science Conference in March, 2006.

AUTOMOTIVE METROLOGY
TBA

There has been no chair since Tim Kypta resigned last year. The committee did meet but with a small attendance. They discussed the TS16949 requirement that commercial laboratories be accredited but that in-house laboratories were required only to have an ISO 9000 audit and that competence is not reviewed at twenty degrees centigrade. They are not pleased with this and are considering a strategy to effect a change to the document. They are also considering an RP for the accreditation of automotive testing laboratories.

TESTING LABORATORIES
Marlene Moore

Marlene held her first meeting. They are planning two articles for the newsletter, one on pH calibration and another on a topic to be determined. They planned a session at next year's conference to include topics on chemical, electromagnetic compatibility and calibration issues. They are also considering an RP to assist testing laboratories in purchasing calibration services.

SMALL BUSINESS
Malcolm Smith

We are looking for new chair to take over after the 2005 Conference. We plan a panel discussion, “Adapt or Die” at the Conference, and are preparing a new work plan based on survey results.

**********

DOCUMENTARY STANDARDS APPLICATIONS
Larry E. Nielsen, V.P.

LABORATORY EVALUATION RESOURCES
TBA

Reactivation of this committee is being sought to develop a handbook to ANSI/ISO/IEC 17025:2005. This committee will also develop a handbook to the new Z540.X standard once completed. No contact with committee chair candidate(s).

LABORATORY FACILITIES
Dr. David Braudway

The revision to RP-14, "Recommended Practice for Selecting Standards Laboratory Environments" is in process by the Publications Oversight committee and has completed a first round of editing. This document should be ready for board for review prior to the fall meeting. Work continues on a new RP on verification of laboratory environments.

Verification of Laboratory Environments. There has been some further development on the work towards a document to evaluate and characterize laboratory performance, especially as building is finished. The plan is to have an essentially complete document with all, or nearly all, of the sections in place available for the (August 2005) committee meeting. Doug Cooper is putting the final touches on this compilation. We will then need to prepare and refine an introduction and add the usual NCSLI prose to have a complete draft document for consideration.
METROLOGY PRACTICES

Dr. Howard Castrup

Calibration Intervals. A workshop meeting was held April 25 - 26 at the Doubletree Hotel in Tucson to identify and implement needed RP-1 changes. Don Wyatt of Diversified Data Systems chaired the meeting which included the following attendees:

Don Wyatt, Diversified Data Systems
Charlie Motzko, C.A. Motzko and Associates
Denis Jackson, Naval Surface Warfare Center
Steve Dwyer, Naval Surface Warfare Center
Greg Cenker, Edison ESI
Mark Coster, BWXT Pantex LLC
Howard Castrup, Integrated Sciences Group

Significant progress was made in scoping out needed changes to the RP. A follow-up meeting was held on April 27 attended by Don Wyatt, Charlie Motzko and myself to flesh out preliminary writing assignments. Don Wyatt is currently reviewing and updating the list for distribution to committee members.

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

Measurement Decision Risk Analysis. There is no activity to report for this quarter.

SPC methods. Work is still in-progress on extending current ANOVA methods to cover part variation, equipment variation, reproducibility, repeatability and uncertainty growth.


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

An investigation has begun into modifying the Welch-Satterthwaite relation to accommodate correlated errors. The results of this effort will be summarized in next quarter's report.

WRITING COMMITTEE

Jesse Morse


We are currently working with ASTM and ASQ on a joint adoption of ISO/IEC 17025:2005.

The secretariat is having regular teleconferences with both organizations. ASTM will submit the BSR and PINS on behalf of the joint adoption. The NCSLI 174 has concluded its balloting process with the adoption passing according to our rules. ASTM has also finished its process, and we are waiting to hear form ASQ.

- Working Group 1 (WG1) activity continues toward the next proposed Z540 standard to be delivered to the consensus body for approval.
- A "Coordination Draft" has been provided electronically by the WG1 for review and comment by the consensus committee. The opportunity to comment closed July 15th. At this writing, comments were very favorable.
- There will be a Working Group meeting at the 2005 NCSLI conference.
- A detailed Q-2 report from the WG-1 chair (Del Caldwell) will be posted on the committee web site for public review.

Working Group One Report

Del Caldwell

The WG1 was chartered in January 2003 to revise the existing National consensus standard, ANSI/NCSLI Z540.1(R2002). Since that time, a number of drafts have been prepared by the WG exploring the best approach to provide requirements for calibration of measuring and test equipment that would complement other contemporary and related standards.

Working Group One met in Washington D.C. in conjunction with the NCSLI 2005 Conference.

Attendees:
Del Caldwell, Chair, CCG
Doug Faison, NIST/NVLAP
Chet Franklin, CSC
Bob Fritzschke, NSWC Corona
John Grigera, Lockheed Martin
Dan Harper, HQA
Del Knapp, Tektonix
Raymond Konowski, NASA
Mark Kramer, USMC
Brian Lee, Anteris Company
Bill McCullough, CSC
Paul Nelson, Raytheon

Observers present:
Curt Kiser, Navy, Norfolk
Steve Doty, NSWC Corona

Del Caldwell, one of our Past-Presidents from 1989, comes back to lead this Writing Committee on an important upgrade process. Z540 has been a truly significant success over the years for NCSLI.

The purpose of the meeting was to complete the review of about 65 comments resulting from the Writing Committee review of Coordination Draft 1.0 of ANSI/NCSLI Z540.X. As a result of the review, responses were prepared for each comment and necessary
changes made to the draft. The key changes dealt with improving the approach to provide for managing the risk of an erroneous calibration and adding language to provide for use of a calibration laboratory's accreditation to ISO/IEC 17025.

The coordination draft has been updated and is undergoing coordination within the WG prior to being sent to the full Committee for comment. After this round, it is expected that a formal vote by the Committee to adopt the standard will be initiated before the year's end.

ACCREDITATION RESOURCES
James Jenkins

The revision to RP-9, Calibration Laboratory Capability Documentation Guideline is in process by the Publications Oversight committee and has completed several rounds of editing. This document will be distributed to the board for review prior to the fall meeting. No report from the committee chair.

CALIBRATION PROCEDURES
Dale Varner

Although the draft revision to RP-3, "Calibration Procedures" was submitted to the Publications Oversight committee for editorial review on February 15, changes to the draft are currently being considered by the committee to incorporate requirements for procedures as specified in CD 1.0 of Z540.X.

Committee 176 Membership Listing:
Carlton, Jim
NNSC/GIDEP

Cunavelis, Julie
NSWC, Corona

Fisher, Ryan
Laboratory Accreditation Bureau

Grachanen, Chris
Hewlett Packard

Howe, Guy
Jacob Sverdrip

Larson, Dave
Boeing

Masieio, Laurie
Mays Systems, Inc.

Mojica, Monique
Navy Measurement Science

Neely, Gloria
Navy Measurement Science

Nielsen, Larry
Southern California Edison

Payne, Duke
Jacob Sverdrip

Sanders, Mark
Lockheed Martin

Stenstrom, Jan
Branson

Vander, Dale
Lockheed Martin

Williams, Bob
Navy Measurement Science

Wilson, Terelle
Lockheed Martin

The Calibration/Certification Procedures Committee met at the NCSLI International Workshop and Symposium in Washington, D.C. on August 9, 2005. We welcomed two new members (Julie Cunavelis and Ryan Fisher) to the team.

We had a very good meeting with Del Caldwell updating the committee on the upcoming calibration procedure-related changes to ANSI/NCSLI Z540. The committee will now move forward with how these upcoming changes should be incorporated into the draft revision of RP-3, which is currently based on ISO 17025 requirements. The RP-3 draft revision was sent through an NCSLI proofing review earlier this year and was ready to be sent to the NCSLI Board of Directors for final review, but was pulled back to ensure proper attention was given the upcoming ANSI/NCSLI Z540 changes.

In addition to our bi-monthly teleconference meetings, this committee will meet in Anaheim, CA at the annual Measurement Science Conference in February 2006. Any measurement professional interested in participating in the Calibration/Certification Procedures Committee should contact Dale Varner by phone at 303-977-5523 or email at <dale.varner@lmco.com>. You do not have to be an NCSLI member or member delegate to participate.

********

2005 CONFERENCE REPORT
Carol Hockert, V.P.

The 2005 conference was held at the Washington Hilton and Towers, in Washington, D.C. Total attendance was 1142, with 323 attending tutorials before and after the conference.

Our Keynote Speaker was Deputy Director of NIST, Dr. Samerjian. Dr. Semerjian kicked off the conference by talking about "Expanding the Frontiers of Measurement." His talk focused on the new Advanced Measurement Laboratory, and enticed attendees into taking the tour of the lab later in the week.

NIST hosted a special tour of the AMC for National Metrology Institute (NMI) directors. As a result, we had a record number of NMI representatives in attendance at the conference.

There were 19 tutorials offered on a wide range of subjects. (340 signed up, 323 showed up)

This was the first time we've ever offered translation services (into Spanish) for portions of the program.

The exhibit hall was filled with 125 exhibits, taking up 154 exhibit spaces. Exhibitors commented that this was a very productive show for them and were eager to sign up for exhibit space in Nashville for 2006.

From the 149 papers submitted in four categories, four were chosen as best in their category and one of these was picked as best overall paper. Winners were:

Guest tours and NIST tours were well-attended.

The International Event on the Nina's Dandy (Potomac boat cruise) was a sold-out success.

The 2006 Conference will be in Nashville. Over 135 exhibit booth spaces have already been sold for this event. For the 2006 conference, speakers who submit a manuscript by the deadline will pay a reduced registration fee of $200 for the conference. All other speakers will pay the early bird rate - as they do now - if they do not submit a manuscript by the deadline. The Renaissance is the host hotel in 2006. The committee is already working on making the 2006 conference the best conference ever.

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

********

EDUCATION & TRAINING
Georgia Harris, V.P.

Training Resources Committee

Training and education is vital to the success of everyone in the metrology profession and the NCSLI community. The NCSLI
Committee News

Training Information Directory lists metrology and calibration training resources and is found at <www.ncsl.org/training/info_directory/index.cfm>. One of the goals of this committee is to make this Directory the primary resource for individuals seeking information on metrology training. Members can help us reach this goal by adding training information to the Directory. Just select “Add/Update Resources” from the above link.

If you are not a member, forward the information to the committee for input into the Directory. With everyone working together to publicize training opportunities, we’re guaranteed success.

Regina Reese
Chambersburg, PA
(717) 267-8117
<regina.reese@us.army.mil>

Georgia Harris reported on the “Strategic Roadmap for Metrology Education & Training” a task that began in January 2005. This is the primary activity for the Education & Training committees in this year’s Long Range Plan. The NCSLI board agreed that we will seek support and input from, and partnering with, the Measurement Science Conference and the American Society for Quality, Measurement Quality Division to have a final roadmap that represents the entire metrology community, not just NCSLI. We will also be gathering "endorsements" of the final roadmap from other organizations to show greater weight when the results of the effort are presented to others for guidance and direction.

Highlights from the Conference

Several kiosks were on display to gather insight from the attendees regarding priorities of the 11 categories (presented in the last Newsletter and noted again at the end of this section) and to generate IDEAS about what we should do with the various categories. Georgia Harris, Gloria Neely, Mark Lapinskes, and Susan Dass also presented the Roadmapping overview and some key projects of the Education and Training Committees during one of the conference sessions and received a lot of good feedback on creative ideas for what we should do.

Georgia estimated that about 120 people voted (with dots on the kiosks) and the relatively low participation disappointed her. However, many good ideas were submitted that will be compiled and shared in the future. The top 3 categories were:

• Metrology and Standards Outreach (#1): “Ensure awareness of metrology, measurement sciences, and needs for calibration and standards in such a way that it is readily recognized by organizational managers and the general public.

• Personnel Qualifications (#3): “Ensure that appropriate methods or systems are in place to provide appropriate recognition and credibility for the metrology professions.

• Metrology Education (#4): “Provide multiple forums for metrology educators to interact, and to encourage sharing of ideas and resources, and to help ensure that stakeholder educational needs are met.

Current committee activities that are related to the top ideas include the following:

• The 163 Personnel Training and Qualifications committee (Gloria Neely (Navy), Chair) is working on a short RP on different methods for identifying and documenting on-the-job-training (OJT). The committee met at the Conference and much of the discussion focused on sharing ideas about the new RP and ideas regarding “metrology & standards outreach.

• The 163.1 Working Group on Standard Occupational Classifications and the ASQ Measurement Quality Division are working on a job description survey. They have gathered a couple hundred job descriptions and are doing an initial analysis. See the article by Chris Grachanen (HP, working group chair) on p. xx in this Newsletter for additional details on this project.

• The 164 Education Liaison committee (Mark Lapinskes (Sypris), Chair) has worked on a number items including: a project to standardize funds distribution by category and include this in the guidelines has a target completion date of October 1 for submission, a project to update and enhance the website and make scholarship information made visible, getting more schools to participate in NCSLI scholarships, including those that are international, and is working on a brochure to promote the new Sponsorship program for scholarships: "Metrology, Quality & Standards Education Sponsorship Program.

In April 2005, the BOD approved the sponsorship of scholarships and she has prepared a draft administrative guideline that will be refined and presented at the October board meeting. In August 2005, the BOD approved an education and training award, pending review and finalization of the guideline on its implementation at the October board meeting as well.

The next category of priority interest at the Conference was:

• Training Opportunities (#6): “Ensure development, implementation, and recognition of real-time (fast-response) metrology training.

Georgia gave some background on the training directory and training. The directory has been published since the early 1980s. It was widely distributed to members and non-members. When it was posted to the website and converted to an electronic file there were barriers installed so that only members could post. That limited its usefulness and people went elsewhere to get this information. We have several people working on projects to get this information updated.

We have heard complaints at section meetings that the Training Aids Library has old material. New material has recently been purchased and funds are available. If people have ideas for good training resources that could be purchased and put in the Training Aids Library, they should provide the information to Georgia <gharris@nist.gov>.

One area that received the lowest number of votes was:

• Technology Trend Analysis (#9): “Ensure identification of potential education and training needs in support of measurements and standards needed for new technology infrastructures.
Although this was the lowest rated by attendees, Georgia felt people were probably thinking tactically now, rather than what they will be doing in ten years.

There are a number of working projects:

"Carroll Brickenkamp (Pi Group) is calling high level national training managers to get input on Strategic needs in metrology education and training.

"Susan Dass (Applied Research Associates) reviewed several of the video resources from the Training Aids Library and suggested some creative updating solutions during the Roadmapping session at the Conference.

"Regina Reese (Army) has agreed to be the contact person on getting the Training Information Directory updated (see the sidebar).

These and the many other new ideas that were submitted in the surveys will require reassessing what committees are in place and rearranging them for the new activities. A number of people approached Georgia during the conference wanting to become involved when they saw the level of activity on training and education.

You can still participate in gathering input! Here are the strategic challenges along with some examples of What We Should Do. Share your additional ideas with Georgia Harris.

**Strategic Challenges**

1. **Metrology & Standards Outreach.** Ensure awareness of metrology, measurement sciences, and needs for calibration and standards in such a way that it is readily recognized by organizational managers and the general public.

2. **Career Opportunities.** Ensure that clear career paths are identified and communicated as widely as possible and to ensure that labor statistics are tracked and available.

3. **Personnel Qualification.** Ensure that appropriate methods or systems are in place to provide appropriate recognition and credibility for the metrology professions.

4. **Metrology Education.** Provide multiple forums for metrology educators to interact, and to encourage sharing of ideas and resources, and to help ensure that stakeholder educational needs are met.

5. **Training Resources.** Ensure that information and resources on metrology education and training are widely available and to ensure a high level of awareness.

6. **Training Opportunities.** Ensure development, implementation, and recognition of real-time (fast-response) metrology training.

7. **Training Assessment & Certification.** Develop and provide an infrastructure for assessment (and certification) of metrology training courses.

8. **Knowledge Management.** Ensure that critical infrastructure needs for ongoing knowledge management are in place and flexible enough to capture and widely disseminate metrology expertise.


10. **Collaboration.** Ensure that the entire metrology community and stakeholders work together to gain synergy in achieving our goals.

11. **Funding.** Ensure that adequate resources are available to support metrology education and training.
DEVELOPING COUNTRIES MEASUREMENT TECHNOLOGY, PRODUCTS AND INFORMATION NETWORK (DCMTPIN)
Deede Erawan

At the Washington Board meeting, Paul Hanssen of Workplace Training introduced Dr. Husein Akil, the head of the Indonesian National Laboratory, and his associate Deede Erawan, Head of the Calibration and Metrology Division. Paul had learned of the DCMTPIN initiative while attending the Second International Workshop on Measurement and Technology for Developing Countries. Mr. Erawan gave a slide presentation on the objectives and structure of the DCMTPIN. It is a group formed in a meeting of some developing countries (China, Thailand, Malaysia, South Africa, Vietnam and Indonesia) in China in 2001. The purpose is to establish a network between developing countries in the fields of metrology, products and information.

From 2004 to the present, Mr. Sunartoto of the Research Center for Calibration, Instrumentation and Metrology, the Indonesian Institute of Sciences (Puslit KIM-LIPI) chaired the Executive Committee. They have held three annual meetings, the first in October 2003 in Beijing and the second in August 2004 in Indonesia and the most recent in May 2005 in Beijing. They are working to define their objectives, programs, activities and membership.

Their draft objective is: "DCMTPIN is a network organization to establish a bridge between NMIs and industries in developing countries to stimulate co-operation between them."

DCMTPIN comprises the following NMIs or organizations: NIM China, Puslit KIM-LIPI Indonesia, SIRIM Malaysia, NIMT Thailand, NML CSIR South Africa, VMI Vietnam.

At least two activities will be conducted regularly.

1. The members of the DCMTPIN will meet every year.
2. The DCMTPIN will hold a biennial International Symposium on Metrology, Physics Application, and Energy Measurement (ISM-PAEM).

The DCMTPIN will hold and provide training for staff from the member institutions as well as for industries. The DCMTPIN plans to publish a newsletter in the future and it is planned to be issued twice a year. Currently, a fee is not charged for membership. The DCMPTIN website is <http://www.dcmtpin.org/>.

INTERNATIONAL CONFERENCE ON METROLOGY

CAMET 2006
4 to 6 April 2006
Casablanca Morocco
Submitted by Charlie Motzko

Please visit this website for a downloadable programme. <www.acmetrology.com>.
Communication Manager in charge of events:
Saloua BANBARYA
<secretariat@acmetrology.com>

Secretariat:

France : COMITE AFRICAIN DE METROLOGIE
CAM-ISTIA 62 av. Notre Dame du Lac 49000 Angers
Tél. : + 33 2 41 22 65 37 Fax : +33 2 41 42 25 24
E-Mail : <camet@acmetrology.com>
Maroc : Mohamed LEMYASSER
ENIM, BP 753 Rabat Aqdal MAROC
Tél. : + 212 37 68 02 30 Fax : + 212 37 77 10 55
E-mail : <jm2006@enim.ac.m>
The Standard

MQD’s monthly publication, The Standard, is available in condensed version, PDF format, on the MQD website for downloading. NCSLI’s own Jay Butcher, Madison Wisconsin Section Coordinator, is editor for The Standard.

New Division Chair

MQD new division chair is Graeme Payne, replacing Dilip Shah, who steps down after two years at the helm. Dilip has been nominated for MQD’s Max J. Unis Award recognizing his dedication and outstanding contributions to MQD and the measurement community. MQD officers’ contact information is available on the MQD website.

CCT Update

There were a total of 152 individuals who sat for the June 7, 2005 offering of the CCT exam with 116 passing. Heartly congratulations go out to all new CCT alumni! Current CCT program stats are:

<table>
<thead>
<tr>
<th>Date of Exam</th>
<th>Sat for Exam</th>
<th>Passed Exam</th>
<th>Passed %</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-Jun-03</td>
<td>97</td>
<td>69</td>
<td>71%</td>
</tr>
<tr>
<td>6-Dec-03</td>
<td>107</td>
<td>69</td>
<td>65%</td>
</tr>
<tr>
<td>23-May-04</td>
<td>4</td>
<td>4</td>
<td>100%</td>
</tr>
<tr>
<td>5-Jun-04</td>
<td>133</td>
<td>102</td>
<td>77%</td>
</tr>
<tr>
<td>4-Dec-04</td>
<td>139</td>
<td>104</td>
<td>75%</td>
</tr>
<tr>
<td>4-Jun-05</td>
<td>152</td>
<td>116</td>
<td>76%</td>
</tr>
</tbody>
</table>

Total CCT Alumni: 464

MQD officers have approved the creation of a commemorative coin for all CCT alumni. Artwork is currently at the vendors with an expected completion date of mid-Sep. Special thanks go out to Jay Bucher, Dilip Shah and Keela Sniadach for all their hard work on this project.

Note: Chris is signed up on the Standard Occupation Classification (SOC) mail list to receive formal notification of the federal register announcement soliciting input for the new SOC.

Note: Chris has been in correspondence with a SOC economist who will hand walk the finalized MJD initiative job descriptions to the appropriate folks at the SOC.

********

INTERNATIONAL ORGANIZATION OF LEGAL METROLOGY (OIML)
Charles Ehrlich, Liaison Delegate

The Weights and Measures Division of the NIST is responsible for coordinating U.S. participation in OIML and other international legal metrology organizations.

Learn more about OIML at the OIML website at <http://www.oiml.org> and the NIST website at <http://www.nist.gov/owm> on the Internet. Dr. Charles Ehrlich, Group Leader, can be contacted at <charles.ehrlich@nist.gov> or at 301-975-4834.

Highlights of Selected OIML Activities

TC3 Metrological Control
A joint work group of the OIML, the International Bureau of Weights and Measures (BIPM), and the International Laboratory Accreditation Cooperation (ILAC) revised OIML D1 “Elements for a Law on Metrology.” This document presents the various elements that should be considered when preparing laws related to metrology. It gives advice on general laws covering all the aspects of legal metrology, as well as specific laws related to some distinct aspects of metrology, such as legal units and traceability. OIML D1 has been published and is available for free on the OIML website.

TC3/SC1 Pattern Approval and Evaluation
The subcommittee has approved the U.S. proposal for a combined revision of OIML D19 and D20 into a single document “Principles of metrological control of measuring instruments: type approval and verification.” Key elements of OIML D3 “Legal Qualification of Measuring Instruments,” R34 “Accuracy Classes of Measuring Instruments,” and R42 “Metal Stamps for Verification Officers” will also be incorporated.

The revised documents will incorporate recent developments such as the OIML certificate system, D27 “Initial verification of measuring instruments utilizing the manufacturer's quality management system,” and the “Framework for a mutual acceptance arrangement (MAA) on OIML type evaluations.” Consideration will be given to the appropriate conformity assessment options, including quality systems, product certification, and accreditation, as well as information technology and statistical methods to increase or decrease verification intervals based upon proven instrument performance. For more information on this activity, contact Dr. Ambler Thompson at 301-975-2333 or at <ambler@nist.gov>.

TC5/SC1 Electronic Instruments (Netherlands)
The final Draft Document of D11 “General Requirements for Electronic Measuring Instruments” was approved by CIML postal ballot in 2004 and has been published. This is an especially important document in the OIML system because its testing requirements will become general guidance for all OIML Recommendations for electronic measuring instruments.

TC5/SC2 Software
An early draft of the document "Software in Legal Metrology" was circulated in October 2004 by the Secretariat. When complete, the document will serve as guidance for OIML technical committees addressing software requirements in Recommendations for software-controlled instruments. U.S. comments on the draft were sent in February 2005, and the next draft is expected late in 2005.
Please contact Wayne Stiegel at 301-975-4011 or by email at <stiegel@nist.gov> if you would like to participate in this project.

**TC8/SC1 Static Volume Measurement**

The Secretariat submitted 1st CD revisions in January 2005 for OIML R71 "Fixed Storage Tanks," R80 "Road and Rail Tankers," and R85 "Automatic Level Gages for Measuring the Level of Liquid in Fixed Storage Tanks." U.S. comments, including those of the American Petroleum Institute, on all three of these documents were sent in April 2005. Please contact Wayne Stiegel at 301-975-4011 or at <stiegel@nist.gov> if you would like copies of the documents or to participate in these projects.

**TC8/SC3 + SC4 Measuring Instruments for Liquids other than Water**

OIML R117 "Measuring Instruments for Liquids other than Water" is undergoing an extensive revision that incorporates new instrument technologies and merges the document with two other OIML Recommendations. The U.S. National Work Group on flowmeters is working closely with Germany, the Netherlands, and Canada on this effort. A 2nd CD of R117 received over 90% international "yes" votes. The Draft Recommendation (DR) will be circulated to OIML member nations in the late summer of 2005 with an objective of receiving approval on R117 in 2006. If you have questions or would like to become involved in this effort, please contact Mr. Ralph Richter by email at <ralph.richter@nist.gov> or at 301-975-4025.

**TC8/SC7 and SC8 Gas Metering**

Comments are due back in November 2005 on the 4th CD "Measuring Systems for Gaseous Fuel." This Recommendation is intended for large pipelines with large flowrates and high operating pressures. OIML R6 "General provisions for gas volume meters," R31 "Diaphragm Gas Meters," and R32 "Rotary Piston Gas Meters and Turbine Gas Meters" have been revised and combined into a single Recommendation. The Secretariat circulated a 2nd CD of this document, and U.S. comments were returned in March 2005. A subcommittee meeting to discuss the document was held in June 2005 in the Netherlands. Please contact Wayne Stiegel at 301-975-4011 or at <stiegel@nist.gov> if you would like to participate in this project.

**TC9/SC1 Non-automatic Weighing Instruments (Germany and France)**

The current review cycle of R76 "Non-automatic Weighing Instruments" is of major importance to U.S. interests because the Recommendation serves as the foundation for a majority of the laws and regulations that govern weighing instruments around the world. This review is significant for U.S. weighing instrument manufacturers because international harmonization of requirements would eliminate technical barriers to trade and reduce the delays and the cost of getting new weighing instruments into the global marketplace. It is also important for legal metrology officials considering participation in the OIML Mutual Acceptance Arrangement (MAA) for type evaluations. A first committee draft was circulated to the USNWG and a U.S. response with comments was sent to the Secretariat in April 2005. If you would like to participate in this effort, please contact Steve Cook at 301-975-4003 or <stevan.cook@nist.gov>.

**Mutual Acceptance Arrangement (MAA) on OIML Type Evaluations**

The OIML MAA has now entered the implementation phase. The first provisional Committee on Participation Review (CPR) has been established for OIML R60 (Load Cells) and R76 (Non-automatic Weighing Instruments).

The first meeting of the CPR was held in June 2005, in Lyons, France, in conjunction with the 40th CIIML Meeting and the 50th Anniversary Celebration of OIML. Twenty-one countries had representatives at the meeting, and the committee reviewed the application files of the nine countries wishing to be Issuing Participants. A draft implementation document on using ISO/IEC 17025 (requirements for testing laboratories), to be used for conducting the legal metrology audits, was also discussed. Another implementation document on ISO Guide 65 (requirements for issuing authorities) was circulated to the CPR for comment after the meeting. These implementation documents will ultimately be distributed as Working Drafts to OIML TC3/SC5 to be developed as OIML Documents.

The U.S. does not currently plan to issue OIML Certificates under the MAA for these categories of instruments, but may utilize those issued by other countries in the future. For further information on the MAA and its implementation, please contact Dr. Charles Ehrlich at <charles.ehrlich@nist.gov> or at 301-975-4834 or by fax at 301-975-5414.

**Upcoming OIML Meetings**

The 41st CIIML Meeting will be hosted by South Africa in Capetown in October 2006. The People's Republic of China will likely host the 42nd CIIML Meeting in China in October 2007.

********

**EUROPEAN COOPERATION FOR ACCREDITATION (EA)**

Graham Cameron, Liaison Delegate

Graham reports that the Standards Council of Canada did not renew its Agreement of Cooperation with the EA this year. Due to the reduced level of communications between SCC and EA, Graham is tendered his resignation as Liaison Delegate for the EA.

********

**INSTITUTE OF ELECTRICAL & ELECTRONICS ENGINEERS, INSTRUMENTATION AND MEASUREMENT (IEEE I&M)**

Dave Braudaway, Liaison Delegate

At the 2005 NCSLI Conference, the IEEE I&M Society had available a listing of the 13 conferences and workshops it annually supports. Also, Norm Belecki has been available to talk about the CPEM rather than just have literature available. NCSLI works with CPEM, a special IEEE conference, but the archivable papers are published in a special issue of the I&M Society Transactions.

Also tried again at the NCSLI 2005 Symposium was a provision by the I&M society for a year’s membership in IEEE for any attendee who signs up during the Symposium or at other conferences. The I&M Society has made this offer before but the results have been limited and mixed. Most who signed up stayed only for the year and did not renew but we do not have reliable statistics.
AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION (A2LA)
Dana S. Leaman, Liaison Delegate

The NCSLI Executive V.P. is taking action to re-name this Liaison Delegate the Accreditation Body Liaison Delegate. Dana Leaman has accepted the position as the representative delegate. The delegate’s responsibility will be to seek reports from all relevant accreditation bodies to compile for the NCSLI board of directors.

A2LA Transition to ISO/IEC 17025:2005

ILAC has confirmed the transition period of two years for the implementation to ISO/IEC 17025:2005. Therefore, A2LA is implementing a transition plan as follows:

- A2LA will purchase and distribute to every A2LA applicant and accredited laboratory copies of ISO/IEC 17025:2005 as soon as it is publicly available (expected by mid-August);
- A2LA will begin performing assessments or gap assessments to the 2005 version on October 1, 2005, according to the laboratory’s usual assessment schedule. If laboratories meet the new requirements, they will be accredited to the 2005 version. If they do not, they will be re-accredited to the 1999 version until acceptable corrective action to the gap requirements is provided (with acceptable resolution required at least by the laboratory’s annual review);
- Beginning on October 1, 2006, all assessments will be performed to the 2005 version, and the laboratories will follow the usual corrective action process;
- For those currently accredited laboratories seeking accreditation to the new version prior to their on-site assessment, the laboratory will need to provide objective evidence that they have implemented the new requirements and A2LA staff will perform a desk audit of the submitted documentation. A2LA will charge a flat fee of $400 for this service and will update the laboratory’s accreditation once all requirements are deemed adequately implemented.

For additional information and guidance on implementing these new requirements and the objective evidence required to meet the 2005 version, please visit “Understanding ISO/IEC 17025: A2LA Specific Applications of the Standard,” which is available on the A2LA website, www.a2la.org.

******

ISA INTERNATIONAL
Mike Suraci, Liaison Delegate

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

<http://www.isa.org/Template.cfm?Section=Events&template=/Calendar/CalendarEventDisplay.cfm&CalendarEventID=542>

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

Walt Bajek, Past ISA President, has inquired status re/IMEKO. This was forwarded to Dave Agy for attention.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
Roxanne Robinson, Liaison Delegate

ASTM has joined with NCSLI and ASQ in the adoption of ISO/IEC 17025 (2005) as an American National Standard. This document should be ready for release by each of these organizations by mid-August 2005.

ASTM is also offering a new feature on its website to Committee members. At the close of each ballot, ASTM officers and members are currently able to access a closing report. Now however, these folks will also be able to access the negative votes and comments resulting from a particular technical ballot.

ASTM is also working to be more efficient in determining the reason why a committee member has been given a non-voting status. The reasons can include redundancy (another member holds the vote); lack of classification; special requests; conflicts of interest, etc. With the reason now entered with a database code, committee roster questions and new committee member questions can be more easily answered.

ASTM is also establishing a program to assist the sponsors of inter-laboratory comparisons in the administrative and statistical tasks associated with developing, implementing, tracking and reporting inter-laboratory comparison results.

******

JOINT LOGISTICS COMMAND (JLC/CCG)
Arman Hovakemian, Liaison Delegate

Assessment Criteria for Cal Labs

None of the services require their labs to be accredited to ISO 17025

The Navy is interested in joint criteria and assessments - POC is Mr. Doty

The Army is interested as well - POCs Jim Hudson & Ron Gelik

Possible Joint Support of Conferences (MSC, NCSLI, etc.)

The Army & AF expressed little to no interest in funding of a joint service booth at conferences.

Merits of a Joint Program

The topic was raised by the Army and centered on the idea of “centers of excellence” for specific measurement areas.

The Group agreed that the services should take advantage of existing capabilities in other services when feasible and cost effective rather than develop new capabilities.

It was pointed out that these opportunities already exist and are being utilized (AF use of Army cal in support of gas mask testers for example). However, it was noted that the services must pay for these calibrations.
PAMS Demo

The Army and Navy have expressed an interest in exploring the possible use of PAMS in their calibration labs. At present it appears that the interest is currently higher in the Army than the Navy.

The Army has a concern about using PAMS at deployed locations and would like some information on Portal Down Time as it relates to PAMS usage.

AFMETCAL Det 1/MLLI to make available info on down time or identify appropriate point of contact at OSSG to Army.

From discussions, it appears that the Army will implement PAMS for processing the AF N49 (radiation hazard meter) workload in the near future as a pilot effort.

********

INTERNATIONAL MEASUREMENT CONFEDERATION (IMEKO)
Chester Franklin, Liaison Delegate

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

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

********

ASIA-PACIFIC LABORATORY ACCREDITATION COOPERATION (APLAC)
Peter Unger, Liaison Delegate

APLAC Multilateral Mutual Recognition Arrangement

The list of signatories to the APLAC MRA is provided on the last page of this report.

APLAC General Assembly

The annual general meeting of the Asia Pacific Laboratory Accreditation Cooperation (APLAC) will meet in Chiang Mai, Thailand, 14-18 November 2005.

APLAC MRA Council

The APLAC MRA Council met in Narita, Japan in April. The March 2005 workshop recommendation to establish an MRA for the accreditation of reference materials producers was approved by the MRA Council at this meeting.

MRA peer evaluation training on ISO/IEC 17011 was held in April 2005, with 42 lead evaluators and other APLAC members in attendance. The key changes and transition plan for ISO/IEC 17011:2004 for accreditation bodies was agreed.

There are twenty signatories to the APLAC MRA (20 for testing; 18 for calibration; and 8 for inspection accreditation).

APLAC Publications

APLAC documents and membership lists are available as PDF files from the APLAC web site: <www.aplac.org>.

"APLAC News Notes," published bi-monthly, is available only by electronic distribution (as a PDF) and via the APLAC web site.

APEC Funded Projects

The Asia Pacific Economic Cooperation (APEC) has funded 6 calibration and 15 testing proficiency testing programs to be run over 3 years.

Board of Management of APLAC

The following officers serve on the APLAC Board of Management for 2005:

Chair: Tony Russell (NATA, Australia)
Officers: Jeffrey Horlick (NVLAP, USA)
Terence S S Chan (HKAS, Hong Kong)
Katuo Seta, (IAJapan, Japan)
Chang Kwei Fern (SAC, Singapore)
Wei Hao (CNAL, China)
MRA Council Chair: Terence Chan (HKAS, Hong Kong)
Immediate Past Chair: Peter Unger (A2LA, USA)
The APLAC Committee Chairs are:
Proficiency Testing Mr Philip Briggs, NATA (Australia)
Public Information Mr Ian Roy, IANZ (New Zealand)
Technical Yoshimoto Uematsu, JNLA (Japan)
Training Mr Wei Hao, CNAL (People's Republic of China)
Nominations Committee: Chuck Ramani (IAS, USA)
## NEW NCSLI MEMBERS

### NEW ENGLAND REGION
- **Pratt & Whitney**  
  E. Hartford, CT 06108  
  Member Delegate:  
  Wayne T. Logee  
  (860) 565-2989

- **Pratt & Whitney Measurement Sys., Inc.**  
  Bloomfield, CT 06002  
  Member Delegate:  
  Daniel Tycz  
  (860) 286-8181

- **Volt Services Group**  
  Chelmsford, MA 01824  
  Member Delegate:  
  Melanie Fenochetti  
  (978) 256-8909

### NY/PAINJ REGION
- **VWR International, Inc.**  
  Bridgewater, NJ 08014  
  Member Delegate:  
  Kenneth Bonnell  
  (856) 241-7288

### MID- ATLANTIC US REGION
- **Acterna**  
  Germantown, MD 20876  
  Member Delegate:  
  David E. Marr  
  (240) 404-3524

### NORTH CENTRAL US REGION
- **Bombardier Aviation Services**  
  Wichita, KS 67277  
  Member Delegate:  
  Cory L. Tourville  
  (316) 946-3154

### SOUTH CENTRAL US REGION
- **Chevron USA**  
  Picayune, MS 39466  
  Member Delegate:  
  Doris Good  
  (601) 749-4059

- **El Paso Pipeline Group**  
  Hockley, TX 77447  
  Member Delegate:  
  Robert J. Runyan  
  (713) 336-5080

### RED RIVER ARMY DEPOT
- **Rohman Services, Inc.**  
  San Antonio, TX 78222  
  Member Delegate:  
  Ronald W. Boone  
  (210) 359-1707

### NORTHEAST US REGION
- **Day Wireless Systems**  
  Wenatchee, WA 98801  
  Member Delegate:  
  Anthony F. Hillock

### CANADA REGION
- **Environment Canada**  
  Toronto, ON M3H 5T4  
  Member Delegate:  
  Rodica Nitu  
  (416) 739-4133

---

### 2006 NCSLI INTERNATIONAL WORKSHOP & SYMPOSIUM

**August 6-10, 2006**  
**Nashville, TN**

- **VP/Conference Management**  
  Carol Hockett  
  (651) 215-5823  
  FAX (651) 639-4014

- **2006 Conference Director**  
  Edward Pritchard  
  (651) 574-4261  
  FAX (651) 574-2802

- **Minutes**  
  Lynn Matthews  
  (651) 446-5530  
  FAX (651) 446-5992

- **Meeting Planner**  
  Tom Huttemann  
  (252) 255-1690  
  FAX (252) 255-1927

- **Exhibits**  
  Craig Gulka  
  (303) 440-3399  
  FAX (303) 440-3384

- **Registration**  
  Joan Wilshire  
  (303) 440-3399  
  FAX (303) 440-3384

- **Technical Program**  
  Karen Semer  
  (740) 788-5150  
  FAX (740) 788-5021

- **Tutorials Program**  
  Klaus Jaeger  
  (408) 867-1743  
  FAX (408) 867-3705

- **Guest Program**  
  Tom Huttemann  
  (252) 763-1600  
  FAX (252) 255-1927

- **Publicity/Marketing**  
  Jesse Morse  
  (425) 446-5468  
  FAX (425) 446-5992

- **Finance**  
  Jack Ferris  
  (231) 334-4891  
  FAX (231) 334-3788

- **Best Paper Selection**  
  Doug Sugg  
  (909) 273-5380  
  FAX (909) 273-5500

- **Conference Evaluation**  
  Terry Conder  
  (651) 736-4331  
  FAX (651) 736-7325

- **Entertainment**  
  Carol Hockett  
  (651) 215-5823  
  FAX (651) 639-4014

- **Door Prizes**  
  Steve Doty  
  (951) 273-5221  
  FAX (951) 273-5175

- **Site Selection**  
  Tony Anderson  
  (407) 333-3327  
  FAX (407) 333-3309

- **VP Operations**  
  Tom Wunsch  
  (505) 644-4359  
  FAX (505) 644-7699

- **VP Education & Training**  
  Georgia Harris  
  (301) 975-4014  
  FAX (301) 926-0647

---
## EXECUTIVE BOARD

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Company/Address</th>
<th>Phone/FAX/Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 PRESIDENT</td>
<td>Harry Moody</td>
<td>Harry J. Moody Enterprises 155 Harrisburg Ln.</td>
<td>(208) 522-9774 FAX(208) 522-9774 e-mail: <a href="mailto:harryjmoozy@cs.com">harryjmoozy@cs.com</a></td>
</tr>
<tr>
<td>20 EXECUTIVE VICE PRESIDENT</td>
<td>Jeff Gust</td>
<td>Quametec Corporation Proficiency Testing Services 01 W. Van Buren, Unit C Columbia City, IN 46725</td>
<td>(260) 244-7450 FAX(260) 244-7905 e-mail: <a href="mailto:gust@quametec-pt.com">gust@quametec-pt.com</a></td>
</tr>
<tr>
<td>30 PAST PRESIDENT</td>
<td>Dave Agy</td>
<td>Fluke Corporation MS: 275G P.O. Box 9090 Everett, WA 98206-9090</td>
<td>(425) 446-5471 FAX(425) 446-5992 e-mail: <a href="mailto:Dave.Agy@fluke.com">Dave.Agy@fluke.com</a></td>
</tr>
<tr>
<td>40 SECRETARY</td>
<td>Dave Abell</td>
<td>Agilent 1021 Diamond Dr. Arcata, CA 95521 (707) 825-0440 FAX(707) 825-0440 e-mail: <a href="mailto:dave_abell@pacbell.net">dave_abell@pacbell.net</a></td>
<td></td>
</tr>
<tr>
<td>50 TREASURER</td>
<td>Jack Ferris</td>
<td>Sleeping Bear Metrology P.O. Box 691 Glen Arbor, MI 49636-0691 (213) 334-4891 FAX(231) 334-3788 e-mail: <a href="mailto:sleeping_bear@hotmail.com">sleeping_bear@hotmail.com</a></td>
<td></td>
</tr>
</tbody>
</table>

## NMI REPRESENTATIVES

<table>
<thead>
<tr>
<th>Region</th>
<th>Name</th>
<th>Address/Contact</th>
<th>Phone/FAX/Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>61 NIST (USA)</td>
<td>Beinda Collins</td>
<td>NIST 100 Bureau Dr., Stop 2000 Gaithersburg, MD 20899-2000 (301) 975-4500 FAX(301) 975-2183 e-mail: <a href="mailto:beinda.collins@nist.gov">beinda.collins@nist.gov</a></td>
<td></td>
</tr>
<tr>
<td>63 CENAM (MEXICO)</td>
<td>Dr. Salvador Echeverria-Villagomez</td>
<td>CENAM A.P. 1-100, Centro Queretaro, Qro. C.P. 76000, Mexico (52-442) 211-0550 FAX(52-442) 211-0553 e-mail: <a href="mailto:saleche@cenam.mx">saleche@cenam.mx</a></td>
<td></td>
</tr>
<tr>
<td>70 BIPM (FRANCE)</td>
<td>Prof. Andrew Wallard</td>
<td>Bureau Int. des Poids et Mesures Pavillon de Brevet Sevres, Cedex 92312 France 33-145-07-70-00 FAX:33-145-34-86-70 e-mail: <a href="mailto:awallard@bipm.org">awallard@bipm.org</a></td>
<td></td>
</tr>
<tr>
<td>71 SIM (SOUTH AMERICA)</td>
<td>Joao Alzirio Herz de Jornada</td>
<td>INMETRO DIMCI Rua Santa Alexandria, 416 Rio de Janeiro, RJ 20261-232 Brazil 55-21-2563-2905 FAX.55-21-2293-6559 e-mail: <a href="mailto:jajornada@inmetro.gov.br">jajornada@inmetro.gov.br</a></td>
<td></td>
</tr>
<tr>
<td>72 DIRECTOR TO ILAC/NACLA</td>
<td>Anthony Anderson</td>
<td>Gulf Calibration Services, Inc. 103 Commerce St., Suite 160 Lake Mary, FL 32746 (407) 333-3327 FAX(407) 333-3309 e-mail: <a href="mailto:tanderson@ncsl.org">tanderson@ncsl.org</a></td>
<td></td>
</tr>
<tr>
<td>73 EUROMET (UK)</td>
<td>Seton Bennett</td>
<td>National Physical Laboratory Hampton Road Teddington, M dx, TW11 0LW UK 44-20-8943-6520 FAX.44-20-8943-6802 e-mail: <a href="mailto:seton.bennett@npl.co.uk">seton.bennett@npl.co.uk</a></td>
<td></td>
</tr>
<tr>
<td>74 EUROLAB (EUROPE)</td>
<td>Horst Czichos</td>
<td>c/o BAM Fed. Inst. Mat. Res. &amp; Test. Unter den Eichen 97 12205 Berlin, Germany 49-30-81-04-10-00 FAX,49-30-81-04-10-07 e-mail: <a href="mailto:horst.czichos@bam.de">horst.czichos@bam.de</a></td>
<td></td>
</tr>
</tbody>
</table>

## OPERATIONS VICE PRESIDENTS

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Company/Address</th>
<th>Phone/FAX/Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>120 VP - OPERATIONS</td>
<td>Tom Wunsch</td>
<td>Sandia National Laboratories Primary Standards Lab P.O. Box 5600 Albuquerque, NM 87185-0665 (505) 844-4359 FAX(505) 844-4372 e-mail: <a href="mailto:twunsch@sandia.gov">twunsch@sandia.gov</a></td>
<td></td>
</tr>
<tr>
<td>130 VP - STANDARDS POLICY</td>
<td>Doug Sugg</td>
<td>NSWC Corona Div. MS: PE00 P.O. Box 5000 Corona, CA 92878-5000 (951) 273-4404 FAX(951) 273-5500 e-mail: <a href="mailto:douglas.sugg@navy.mil">douglas.sugg@navy.mil</a></td>
<td></td>
</tr>
<tr>
<td>140 VP - MEASUREMENT SCIENCE &amp; TECHNOLOGY</td>
<td>Dr. Richard Pettit</td>
<td>7808 Hendrix NE Albuquerque, NM 87110-1522 (505) 292-0789 FAX(505) 292-0789 (call first) e-mail: <a href="mailto:randepettit@comcast.net">randepettit@comcast.net</a></td>
<td></td>
</tr>
<tr>
<td>150 VP - INDUSTRIAL PROGRAMS</td>
<td>Roxanne Robinson</td>
<td>American Asns. for Lab Accreditation 5301 Buckeytown Pike, Suite 350 Frederick, MD 21704 (301) 844-3208 FAX(301) 662-2974 e-mail: <a href="mailto:crobinson@azla.org">crobinson@azla.org</a></td>
<td></td>
</tr>
<tr>
<td>160 VP - EDUCATION &amp; TRAINING</td>
<td>Georgia Harris</td>
<td>NIST Office of Weights &amp; Measures 100 Bureau Dr., Stop 2690 Gaithersburg, MD 20899 (301) 975-4014 FAX(301) 926-0647 e-mail: <a href="mailto:gharris@nist.gov">gharris@nist.gov</a></td>
<td></td>
</tr>
<tr>
<td>170 VP - DOCUMENTARY STANDARDS APPLICATIONS</td>
<td>Larry E. Nielsen</td>
<td>Southern California Edison Metrology 7320 Fenwick Ln. Westminster, CA 92683 (714) 895-0489 FAX(714) 895-0686 e-mail: <a href="mailto:larry.nielsen@sce.com">larry.nielsen@sce.com</a></td>
<td></td>
</tr>
<tr>
<td>180 VP - MARKETING</td>
<td>Jesse Morse</td>
<td>Fluke Corporation MS: 275-G P.O. Box 9090 Everett, WA 98206 (425) 446-5486 FAX(425) 446-5992 e-mail: <a href="mailto:jesse.morse@fluke.com">jesse.morse@fluke.com</a></td>
<td></td>
</tr>
<tr>
<td>190 VP - CONFERENCE MANAGEMENT</td>
<td>Carol Hockert</td>
<td>MN Dept. of Commerce Weights &amp; Measures Div. 2277 Highway 36 Roseville, MN 55113 (651) 215-5823 FAX(651) 639-4014 e-mail: <a href="mailto:carol.hockert@state.mn.us">carol.hockert@state.mn.us</a></td>
<td></td>
</tr>
</tbody>
</table>
### NCSL INTERNATIONAL BOARD OF DIRECTORS (Cont’d)

#### DIVISION VICE PRESIDENTS

<table>
<thead>
<tr>
<th>Division</th>
<th>Vice President</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100 VP - NORTHEASTERN US</td>
<td>Lonnie Spries</td>
<td>Dynamic Technology 1200 N. Old US 23 P.O. Box 559 Hartland, MI 48353-0559 (810) 225-4601 x277 FAX(810) 225-4602 e-mail: <a href="mailto:lsories@dynamictechnology.com">lsories@dynamictechnology.com</a></td>
</tr>
<tr>
<td>1200 VP - SOUTHEASTERN US</td>
<td>Ed Fritchard</td>
<td>Western Environmental Corp. 6954 Westerly Winds Rd. Knoxville, TN 37931 (865) 938-0385 FAX(865) 938-0385 e-mail: <a href="mailto:efritch@tuds.net">efritch@tuds.net</a></td>
</tr>
<tr>
<td>1300 VP - CENTRAL US</td>
<td>Terry Conder</td>
<td>3M Center Corporate Metrology Services Bldg. 205-1-01 St. Paul, MN 55144-1000 (651) 736-4331 FAX(651) 736-7325 e-mail: <a href="mailto:tmconder@mms.com">tmconder@mms.com</a></td>
</tr>
</tbody>
</table>

#### NCSL INTERNATIONAL COMMITTEE CHAIRS 2005

<table>
<thead>
<tr>
<th>Committee</th>
<th>Chair</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 US GOVERNMENT AFFAIRS</td>
<td>George Rodrigue</td>
<td>ARTEL 25 Bradley Dr. Westbrook, ME 04092-2013 (207) 591-6358 FAX(207) 595-0867 e-mail: <a href="mailto:prodrigue@artel-usa.com">prodrigue@artel-usa.com</a></td>
</tr>
<tr>
<td>41 BY-LAWS</td>
<td>Dave Abell</td>
<td>1021 Diamond Dr. Arcata, CA 95521 (408) 553-4425 FAX(707) 825-0444 e-mail: <a href="mailto:dave_abell@agilent.com">dave_abell@agilent.com</a></td>
</tr>
<tr>
<td>120 VP - OPERATIONS</td>
<td>Thomas Wunsch</td>
<td></td>
</tr>
<tr>
<td>121 NCSLI BUSINESS MANAGER</td>
<td>Craig Gulka</td>
<td>NCSL International 2995 Wilderness Place, Suite 107 Boulder, CO 80301-5404 (303) 440-3339 FAX(303) 440-3384 e-mail: <a href="mailto:cgulka@ncsli.org">cgulka@ncsli.org</a></td>
</tr>
<tr>
<td>126 ANSI SECRETARIAT</td>
<td>Craig Gulka</td>
<td>NCSL International 2995 Wilderness Place, Suite 107 Boulder, CO 80301-5404 (303) 440-3339 FAX(303) 440-3384 e-mail: <a href="mailto:cgulka@ncsli.org">cgulka@ncsli.org</a></td>
</tr>
<tr>
<td>128 PUBLICATIONS OVERSIGHT</td>
<td>Michael Lombardi</td>
<td>NIST Div. 847 325 Broadway Boulder, CO 80305-3328 (303) 497-3212 FAX(303) 497-3228 e-mail: <a href="mailto:lombardi@boulder.nist.gov">lombardi@boulder.nist.gov</a></td>
</tr>
<tr>
<td>130 VP - STANDARDS POLICY</td>
<td>Doug Sugg</td>
<td></td>
</tr>
<tr>
<td>131 U.S. MEASUREMENT REQUIREMENTS</td>
<td>Jeff Walden</td>
<td>Naval Warfare Assessment Station Measurement Science Directorate P.O. Box 5000 Corona, CA 92878-5000 (951) 273-4481 FAX(951) 273-5446 e-mail: <a href="mailto:jeffrey.walden@navy.mil">jeffrey.walden@navy.mil</a></td>
</tr>
<tr>
<td>132 CANADIAN MEASUREMENT REQUIREMENTS</td>
<td>Dave Stevens (Co-Chair)</td>
<td>Pulse Engineering, Ltd. 1137 Keewatin St. Winnipeg, MB R2X 2Z3 Canada (204) 633-4321 FAX(204) 697-2264 e-mail: <a href="mailto:sales@pulse-engineering.com">sales@pulse-engineering.com</a></td>
</tr>
<tr>
<td>133 GLOSSARY</td>
<td>Emil Hazarian</td>
<td>NSWC MS: 23C P.O. Box 5000 Corona, CA 92878-5000 (951) 273-4802 FAX(951) 273-4279 e-mail: <a href="mailto:emil.hazarian@navy.mil">emil.hazarian@navy.mil</a></td>
</tr>
<tr>
<td>134 LEGAL METROLOGY</td>
<td>Val Miller</td>
<td>NIST MS: 2600, Room 232 100 Bureau Dr. Gaithersburg, MD 20899 (303) 975-3602 FAX(301) 926-0647 e-mail: <a href="mailto:val.miller@nist.gov">val.miller@nist.gov</a></td>
</tr>
</tbody>
</table>

### 2005 NCSLI BUSINESS MANAGER CANDIDATES

- **Craig Gulka**
- **Dave Abell**
- **Michael Lombardi**

### 2005 ANSI SECRETARIAT CANDIDATES

- **Craig Gulka**

### 2005 PUBLICATIONS OVERSIGHT CANDIDATES

- **Michael Lombardi**

### 2005 STANDARDS POLICY CANDIDATES

- **Doug Sugg**

### 2005 U.S. MEASUREMENT REQUIREMENTS CANDIDATES

- **Jeff Walden**

### 2005 CANADIAN MEASUREMENT REQUIREMENTS CANDIDATES

- **Dave Stevens (Co-Chair)**

### 2005 GLOSSARY CANDIDATES

- **Emil Hazarian**

### 2005 LEGAL METROLOGY CANDIDATES

- **Val Miller**
170 DOCUMENTARY STANDARDS APPLICATIONS Larry Nielsen

171 LABORATORY EVALUATION RESOURCES
TBD

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>

172 LABORATORY FACILITIES
Doug Cooper (Co-Chair)
TAC Americas
1770 Mason Morrow Rd.
Lebanon, OH 45036
(513) 770-5713 FAX(513) 398-9048
e-mail: <doug.cooper@tac.com>

173 METROLOGY PRACTICES
Howard Castrup
Integrated Sciences Group
14838 Gastas Canyon Rd.
Bakersfield, CA 93386
(661) 872-1863 FAX(661) 872-3669
e-mail: <hcastrup@isgmax.com>

174 WRITING COMMITTEE
Jesse Morse
Fluke Corporation
MS: 275-G
P.O. Box 9090
Everett, WA 98206
(425) 446-5468 FAX(425) 446-5992
e-mail: <jesse.morse@fluke.com>

174 WRITING COMMITTEE
Bob Fritzschke (Co-Chair)
Naval Surface Warfare Center
MS: 008
P.O. Box 5000
Corona, CA 91718-5000
(951) 273-4404 FAX(951) 273-5500
e-mail: <robert.fritzschke@navy.mil>

174.2 WORKING GROUP #1
Del Caldwell
Caldwell Consulting Group
908 Pomone Ct.
Claremont, CA 91711-3864
(909) 624-8685
e-mail: <delcaldwell@compuserve.com>

176 ACCREDITATION RESOURCES
James Jenkins
Quametec Corp.
17800 Collinson Ave.
Eastpointe, MI 48021
(586) 775-5495 FAX(585) 775-5123
e-mail: <jenkins@quametec.com>

176 CALIBRATION/CERTIFICATION PROCEDURES
Dale Varner
Lockheed Martin Technical Operations
MS: P9882
P.O. Box 179
Denver, CO 80201
(303) 977-5523 FAX(303) 971-5635
e-mail: <dale.varner@lmco.com>

180 MARKETING Jesse Morse

181 HONORS & AWARDS
Jack Somppi
Fluke Corporation
6920 Seaway Blvd.
Everett, WA 98206
(425) 446-5469 FAX(425) 446-5992
e-mail: <jack.somppi@fluke.com>

182 BENCHMARKING PROGRAMS
John Wade Keith III
Boeing
MS: H014-C422
5301 Bolsa Ave.
Huntington Beach, CA 92647
(714) 896-2070 FAX(714) 896-5534
e-mail: <wade.keith@boeing.com>

183 MEMBERSHIP
Jack Somppi
Fluke Corporation
6920 Seaway Blvd.
Everett, WA 98206
(425) 446-5469 FAX(425) 446-5992
e-mail: <jack.somppi@fluke.com>

184 PUBLICITY
James E. Smith
The Boeing Company (TEMC)
MS: H021-F144
5301 Bolsa Ave.
Huntington Beach, CA 92647-2099
(714) 896-1670 FAX(714) 896-5534
e-mail: <james.e.smith@boeing.com>

190 VP CONFERENCE MANAGEMENT Carol Hockert

191 SITE SELECTION
Anthony Anderson
Gulf Calibration Services, Inc.
103 Commerce St., Suite 160
Lake Mary, FL 32746
(407) 333-3327 FAX(407) 333-3309
e-mail: <tanderson@ncsl.org>

192 WORKSHOP AND SYMPOSIUM STAFF

2005 TECHNICAL PROGRAM
Dr. Richard Pettit (Co-Chair)
7808 Hendrix NE
Albuquerque, NM 87110-1522
(505) 292-0789 FAX: same (call first)
e-mail: <randepettit@comcast.net>

Karen Semer (Co-Chair)
AFMETCAL Det 1
Primary Standards Lab
813 Irving-Wick Dr.
Heath, OH 43056
(740) 788-5150 FAX(740) 788-5021
karen.semer@afmetalcal.af.mil

2005 TUTORIAL PROGRAM
Klaus Jaeger
Jaeger Enterprises
13685 Calle Tacuba
Saratoga, CA 95070-4918
(408) 867-1743 FAX(408) 867-3705
e-mail: <jaegerenterprises@comcast.net>

2005 CONFERENCE DIRECTOR
Gary Jennings
Northrop Grumman
MS: M21
P.O. Box 746
Baltimore, MD 21203-0746
(410) 993-5400 FAX(410) 993-5001
e-mail: <gary.jennings@ngc.com>

2006 CONFERENCE DIRECTOR
Edward Pritchard
Western Environmental Corp.
6954 Wisterly Winds Rd.
Knoxville, TN 37931
(865) 938-0365 FAX(865) 938-0365
e-mail: <epritch@tds.net>

2007 CONFERENCE DIRECTOR
Harry Spinks
Boston Scientific
2 Scemed Place
Maple Grove, MN 55111-1566
(763) 494-1945 FAX(763) 494-1404
e-mail: harry.spinks@bsci.com
NCSL INTERNATIONAL REGION COORDINATORS 2005

1100 VP NORTHEASTERN US Lonnie Spires

1122 Upstate New York Section
Bradley J. Darois
CallSource Metrology Solutions
1005 W. Fayette St., Suite D
Syracuse, NY 13204
(315) 425-1151 FAX(315) 425-1175
e-mail: <brad@callsourc.com>

1130 Mid-Western US Region
Lloyd Baker
Dynamic Technology, Inc.
P.O. Box 559
Harland, MI 48335
(810) 226-4601 FAX(810) 225-4802
e-mail: <l baker@dynamictechnology.com>

1133 Central Indiana Section
Charles Andrew
Eli Lilly and Company
MC263/DC2607
Lilly Corporate Center
Indianapolis, IN 46285
(317) 276-1459 FAX(317) 276-2038
e-mail: <andrew_charles_c rc@illy.com>

1120 NY/PA/NJ Region
Kyle Laukaitis
CalSource
1005 W. Fayette St., Suite 4D
Syracuse, NY 13204
(315) 425-1151 FAX(315) 425-1175
e-mail: <kyle@callsource.com>

1123 Philadelphia Section
Joe Moran
Henry Troenmer LLC
P.O. Box 87
Thorofare, NJ 08086
(856) 836-4261 FAX(856) 686-1601
e-mail: <jmoran@troenmer.com>

1131 Northern Ohio Section
Tom Powia
Broadview Instrumentation Svc., Inc.
7632B Hub Pkwy.
Valley View, OH 44125
(216) 525-0050 FAX(216) 525-0051
e-mail: <tpowia@calibrationservice.com>

1134 Northern Indiana Section
Laboratory Accreditation Bureau
906 Main St., 3rd Floor
New Haven, IN 46774
(260) 493-0822 FAX(260) 493-0812
e-mail: <dleonard@j-a-b.com>

1121 New York City Section
Don Bansen
Dayton T. Brown, Inc.
Calibration Lab. Dept. 14
1195 Church St.
Bohemia, NY 11716-5301
(631) 589-6300 /723 FAX(631) 244-6234
e-mail: <dbansen@dtb.com>

1124 Pittsburgh Section
Karl Kleevens
Process Instruments
615 E. Carson St.
Pittsburgh, PA 15203
(412) 431-4600 FAX(412) 431-3792
e-mail: <kkleevens@procinst.com>

1200 VP SOUTHEASTERN US Edward Pritchard

1210 Mid-Atlantic US Region
Dana Leaman
American Assn. for Lab Accreditation
Suite 350
5301 Buckeystown Pike
Frederick, MD 21704
(301) 644-3248 FAX(301) 662-2974
e-mail: <deaman@2a2.org>

1213 Virginia Section
Tom Hettenhouiser
1413 Patrick Cir. SW
Vienna, VA 22180
(703) 909-3966
e-mail: <thettenhouiser@cox.net>

1220 Southern US Region
Robert Gangaware
Gulf Calibration Services, Inc.
103 Commerce St., Suite 160
Lake Mary, FL 32746
(407) 333-3327 FAX(407) 333-3309
e-mail: <bgangaware@gcalibration.com>

1222 Central Florida Section
Ray Minchin
Lockheed Martin Information Systems
MP 829
12506 Lake Underhill Rd.
Orlando, FL 32825-5002
(407) 306-1270 FAX(407) 306-2271
e-mail: <raymond.l.minchin@lmco.com>

1223 Huntsville Section
Greg St. Charles
Boeing Huntsville
MS: JY-66
P.O. Box 240002
Huntsville, AL 35824
(256) 461-5456 FAX(256) 772-2613
e-mail: <gregory.st.charles@hsbboeing.com>

1224 Tennessee Section
Ada McConnell
Eastman Chemical Co.
Tennessee Eastman Div. Bldg. 277A
P.O. Box 511
Kingsport, TN 37662
(423) 229-1041 FAX(423) 229-5516
e-mail: <ada@eastman.com>

1211 Maryland Section
Rudy Stirm
Northrop Grumman Corp.
ESSD - MS: 751
P.O. Box 746
Baltimore, MD 21203
(410) 993-3074
e-mail: <henry.stirm@ngc.com>

1212 North Carolina Section
TBD

1221 Atlanta Section
Mark Kramer
Marine Corps Logistics Base
Maintenance Center, Code 883
814 Radford Blvd., Suite 20325
Albany, GA 31704-0325
(229) 639-6049 FAX(229) 639-6172
e-mail: <mark.a.kramer@usmc.mil>

1225 Puerto Rico Section
Angel Pabelon
Advanced Instruments
P.O. Box 29502
San Juan, PR 00929
(787) 622-1133 FAX(787) 762-1833
e-mail: <apabelon@advpr.com>
<table>
<thead>
<tr>
<th>Region/note</th>
<th>Name</th>
<th>Company/Role</th>
<th>Address</th>
<th>Phone</th>
<th>Fax</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310 North Central US Region</td>
<td>Jay Bucher</td>
<td>Promega Corp.</td>
<td>5445 E. Cheryl Pkwy, Madison, WI 53711</td>
<td>(608) 277-2522 FAX(608) 277-2516</td>
<td></td>
<td><a href="mailto:jay.bucher@promega.com">jay.bucher@promega.com</a></td>
</tr>
<tr>
<td>1311 Twin Cities Region</td>
<td>Shawn Mason</td>
<td></td>
<td>St. Jude Medical 177 E. County Rd. B St. Paul, MN 55117</td>
<td>(651) 490-4476 FAX(651) 490-4498</td>
<td></td>
<td><a href="mailto:shmason@sm.com">shmason@sm.com</a></td>
</tr>
<tr>
<td>1312 Chicago Region</td>
<td>Andrew Duchaine</td>
<td>J.H. Metrology Co., Inc.</td>
<td>1801 Hicks Rd., Unit E Rolling Meadows, IL 60008</td>
<td>(847) 991-0290 FAX(847) 991-0348</td>
<td></td>
<td><a href="mailto:andyj@metrology.com">andyj@metrology.com</a></td>
</tr>
<tr>
<td>1313 St. Louis Region</td>
<td>Brent W. Griffith</td>
<td>Boeing Company</td>
<td>MC: S102-2199 P.O. Box 516 St. Louis, MO 63166-0516</td>
<td>(314) 232-9247 FAX(314) 232-3445</td>
<td></td>
<td><a href="mailto:brent.w.griffith@boeing.com">brent.w.griffith@boeing.com</a></td>
</tr>
<tr>
<td>1314 Kansas City Region</td>
<td>Roger Burton</td>
<td>Honeywell FM&amp;T</td>
<td>E14 BR28 P.O. Box 419159 Kansas City, MO 64141-6159</td>
<td>(816) 997-5431 FAX(816) 997-3856</td>
<td></td>
<td><a href="mailto:rburton@kc.com">rburton@kc.com</a></td>
</tr>
<tr>
<td>1315 Central Illinois Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TBD</td>
</tr>
<tr>
<td>1316 Rockford Illinois Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TBD</td>
</tr>
<tr>
<td>1320 South Central US Region</td>
<td>Christopher Grachanen</td>
<td>Hewlett Packard Co. Corp. Metrol., MS: 070110 P.O. Box 692000 Houston, TX 77070-2698</td>
<td>(281) 518-6486 FAX(281) 518-7275</td>
<td></td>
<td></td>
<td><a href="mailto:chris.grachanen@hp.com">chris.grachanen@hp.com</a></td>
</tr>
<tr>
<td>1321 Central Texas Region</td>
<td>Gregg Shuman</td>
<td>Verizon ERS Metrology 4255 Patriot Dr., Suite 401 Grapevine, TX 76051</td>
<td>(972) 724-6036 FAX(972) 724-6344</td>
<td></td>
<td></td>
<td><a href="mailto:gshuman@verizon.com">gshuman@verizon.com</a></td>
</tr>
<tr>
<td>1322 South Texas Region</td>
<td>Keith Scoggins</td>
<td>South Texas Project Nuclear Oper. Co. MS: L-1001, Metrol. &amp; Radiol. P.O. Box 289 Wadsworth, TX 77144</td>
<td>(361) 972-7742 FAX(361) 972-8368</td>
<td></td>
<td></td>
<td><a href="mailto:ksscoggins6@hotmail.com">ksscoggins6@hotmail.com</a></td>
</tr>
<tr>
<td>1323 Boulder/Denver Region</td>
<td>Dale Varner</td>
<td>Lockheed Martin Technical Operations MS: P9682 P.O. Box 179 Denver, CO 80201</td>
<td>(303) 977-5523 FAX(303) 971-5635</td>
<td></td>
<td></td>
<td><a href="mailto:dale.varner@lmlco.com">dale.varner@lmlco.com</a></td>
</tr>
<tr>
<td>1324 Albuquerque Region</td>
<td>Tom Wunsch</td>
<td>Sandia National Laboratories Primary Standards Laboratory P.O. Box 5800 Albuquerque, NM 87185-0665</td>
<td>(505) 844-4359 FAX(505) 844-4372</td>
<td></td>
<td></td>
<td><a href="mailto:twunsch@sandia.gov">twunsch@sandia.gov</a></td>
</tr>
<tr>
<td>1325 Gulf Coast Region</td>
<td>Ken Garcia</td>
<td>Lockheed Martin Technical Operations Bldg. 5100, Rm. M110 Stennis Space Center, MS 38952</td>
<td>(228) 813-2073 FAX(228) 813-2073</td>
<td></td>
<td></td>
<td><a href="mailto:kenneth.i.garcia@lmlco.com">kenneth.i.garcia@lmlco.com</a></td>
</tr>
<tr>
<td>1400 VP WESTERN US Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1410 Central California/Nevada Region</td>
<td>Richard Fertell</td>
<td>Proteus Industries, Inc. Quality Assurance Dept. 340 Pioneer Way Mountain View, CA 94041</td>
<td>(650) 964-4183 FAX(650) 965-9355</td>
<td></td>
<td></td>
<td><a href="mailto:richard@proteusind.com">richard@proteusind.com</a></td>
</tr>
<tr>
<td>1412 LA/Orange Co. Region</td>
<td>Marjory Heron</td>
<td>The Boeing Company (TEMC) MS: H021-F-144 5301 Bolsa Ave. Huntington Beach, CA 92647-2099</td>
<td>(714) 896-1021 FAX(714) 896-5534</td>
<td></td>
<td></td>
<td><a href="mailto:marjory.t.heron@boeing.com">marjory.t.heron@boeing.com</a></td>
</tr>
<tr>
<td>1413 San Diego Region</td>
<td>Martin D. Bakker</td>
<td>Anmar Metrology, Inc. 7726 Agons Dr., #B SanDiego, CA 92126-4365</td>
<td>(858) 621-2630 FAX(858) 621-6019</td>
<td></td>
<td></td>
<td><a href="mailto:marty@anmar.com">marty@anmar.com</a></td>
</tr>
<tr>
<td>1414 Phoenix-Tucson Region</td>
<td>Rob Parchinski</td>
<td>The Boeing Company M/S: M543-D152 5000 E. McDowell Rd. Mesa, AZ 85215</td>
<td>(480) 891-6651 FAX(480) 891-8197</td>
<td></td>
<td></td>
<td><a href="mailto:rob.parchinski@boeing.com">rob.parchinski@boeing.com</a></td>
</tr>
<tr>
<td>1415 Southwest US Region</td>
<td>James E. Smith</td>
<td>The Boeing Company (TEMC) MS: H021-F-144 Att’n: Jim 5301 Bolsa Ave. Huntington Beach, CA 92647-2099</td>
<td>(714) 896-1670 FAX(714) 896-5534</td>
<td></td>
<td></td>
<td><a href="mailto:james.e.smith@boeing.com">james.e.smith@boeing.com</a></td>
</tr>
<tr>
<td>1421 LA/Valley Region</td>
<td>Miguel Cerezo</td>
<td>Amgen, Inc. MS: 21-2-C 1 Amgen Center Thousand Oaks, CA 91320-1789</td>
<td>(805) 447-1126 FAX(805) 499-8733</td>
<td></td>
<td></td>
<td><a href="mailto:mcerezo@amgen.com">mcerezo@amgen.com</a></td>
</tr>
<tr>
<td>1422 Utah Region</td>
<td>Bernard Morris</td>
<td>Hart Scientific, Inc. 799 E. Utah Valley Dr. American Fork, UT 84003-9775</td>
<td>(801) 763-1600 FAX(801) 763-1010</td>
<td></td>
<td></td>
<td><a href="mailto:bernie_morris@hartscientific.com">bernie_morris@hartscientific.com</a></td>
</tr>
<tr>
<td>1430 Northwest US Region</td>
<td>Carolyn Johansen</td>
<td>JJ Calibration, Inc. 7007 SE Lake Rd. Portland, OR 97287-2105</td>
<td>(503) 786-3005 FAX(503) 786-2994</td>
<td></td>
<td></td>
<td><a href="mailto:carolynj@jjcalibrations.com">carolynj@jjcalibrations.com</a></td>
</tr>
<tr>
<td>Region</td>
<td>Full Name</td>
<td>Company</td>
<td>Address</td>
<td>Phone</td>
<td>Fax</td>
<td>Email Address</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------------------</td>
<td>-----------------------</td>
<td>----------------------------------------------</td>
<td>-------</td>
<td>-----------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Canada</td>
<td>Jim Mullins</td>
<td>Pylon Electronics Inc</td>
<td>147 Collonade Rd Nepean, ON K2E 7L9 Canada</td>
<td>(613)</td>
<td>226-7920</td>
<td><a href="mailto:jmullins@pylonelectronics.com">jmullins@pylonelectronics.com</a></td>
</tr>
<tr>
<td>Quebec</td>
<td>Robert Armand</td>
<td>Hydro-Quebec/IREQ</td>
<td>1800, Boul. Lionel-Boulet Varennes, QC J3X1S1 Canada</td>
<td>(450)</td>
<td>652-8036</td>
<td><a href="mailto:armand.jord@ireq.ca">armand.jord@ireq.ca</a></td>
</tr>
<tr>
<td>Mexico</td>
<td>Roberto Benitez</td>
<td>Metrica, S.A. de C.V</td>
<td>Monterrey, N.L 64280 Mexico</td>
<td>52-81</td>
<td>8370-2600</td>
<td><a href="mailto:roberto@metrica.com.mx">roberto@metrica.com.mx</a></td>
</tr>
<tr>
<td>Caribbean</td>
<td>Hermon Edmondson</td>
<td>Jamaica Bureau of Standards</td>
<td>6 Winchester Rd P.O. Box 113 Kingston, 10, Jamaica</td>
<td>(876)</td>
<td>929-3140</td>
<td><a href="mailto:hedmondson@bs.org.jm">hedmondson@bs.org.jm</a></td>
</tr>
<tr>
<td>Atlantic</td>
<td>João Alzoro Herz de Jornada</td>
<td>INMETRO</td>
<td>Rua Santa Alexandria, 416 Rio de Janeiro, RJ 20261-232 Brazil</td>
<td>55-212</td>
<td>2563-2904</td>
<td><a href="mailto:jj@inmetro.gov.br">jj@inmetro.gov.br</a></td>
</tr>
<tr>
<td>Europe</td>
<td>Haakan Nilsson</td>
<td>Swedish Nat. Test. &amp; Res. Institute Measurement Technology</td>
<td>P.O. Box 857 Boras, Sweden SE-501 15 46-33-16-53-87 FAX-46-33-16-56-20</td>
<td>(46)</td>
<td>33-44-16-53-87</td>
<td><a href="mailto:hakahnilsson@smtp.se">hakahnilsson@smtp.se</a></td>
</tr>
<tr>
<td>Ireland/UK</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Europe</td>
<td>Ionel Udrea Marcus</td>
<td>National Institute of Metrology</td>
<td>11, Sos. Vitu-Barzesti 75669 Bucharest, Sect. 4, Romania</td>
<td>40-21-334-5060</td>
<td>x167 FAX-40-21-334-5345</td>
<td><a href="mailto:curdea@inm.ro">curdea@inm.ro</a></td>
</tr>
<tr>
<td>Middle East/Africa</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>Israel</td>
<td>Dr. Ilya Kuselman</td>
<td>National Physical Lab of Israel</td>
<td>Givat Ram Jerusalem, 91904 Israel 972-2-652-1856 FAX-972-2-652-0797</td>
<td>(972)</td>
<td>2-652-1856</td>
<td><a href="mailto:ilya.kuselman@moilt.gov.il">ilya.kuselman@moilt.gov.il</a></td>
</tr>
</tbody>
</table>

**1000 VP INTERNATIONAL DIVISION** Malcolm Smith

**1700 CANADA REGION**

**1700.1 Canada Region Secretariat**

Wayne Sampson
Pylon Atlantic, Inc.
201 Wright Ave.
Dartmouth, NS B3B 1V6 Canada
(902) 468-3344 x244 FAX(902) 468-1203
e-mail: <w sampson@pylon electronics.com>

**1710 Eastern Canada Section**

Wayne Sampson
Pylon Atlantic, Inc.
201 Wright Ave.
Dartmouth, NS B3B 1V6 Canada
(902) 468-3344 x244 FAX(902) 468-1203
e-mail: <w sampson@pylon electronics.com>

**1720 Eastern Ontario Section**

Carlos Sannzaros
Atomic Energy of Canada, Ltd.
CPFS Sheridan Park SP3 2251 Speakman Dr.
Missisauga, ON L5K 1B2 Canada
(905) 823-9040 x2199 FAX(905) 823-6448
e-mail: <sannzaros@aecl.ca>

**1730 Quebec Section**

Robert Armand
Hydro-Quebec/IREQ
Lab d'étalonage et reparation 1800, Boul. Lionel-Boulet Varennes, QC J3X1S1 Canada
(450) 652-8036 FAX(450) 652-8041
e-mail: <armand.jord@ireq.ca>

**1740 Western Ontario Section**

TBD

**1750 Western Canada Section**

Dr. Malcolm Smith
Wescan Calibration Services
12240 Horseshoe Way, Unit 9 Richmond, BC V7A 4X9 Canada
(604) 275-0600 FAX(604) 275-0610
e-mail: <msmith@wescan cal.com>

**1800 Mexico Region**

Roberto Benitez
Metrca, S.A. de C.V.
Alfonso Reyes #2620
Fracc. B. Reyes
Monterrey, N.L 64280 Mexico
52-81-8370-2600 FAX:52-81-8129-6466
e-mail: <roberto@metrica.com.mx>

**2000 Latin/South America Region**

**2100 Caribbean**

Hermon Edmondson
Jamaica Bureau of Standards
6 Winchester Rd
P.O. Box 113
Kingston 10, Jamaica
876-929-3140 FAX 876-929-4736
e-mail: <hedmondson@bs.org.jm>

**2200 South Atlantic**

Joao Alzoro Herz de Jornada
INMETRO
DINCI
Rua Santa Alexandria, 416
Rio de Janeiro, RJ 20261-232 Brazil
55-212-2563-2904 FAX:55-212-2293-6559
e-mail: <jj@inmetro.gov.br>

**2300 Ecuador**

Felipe Uresta
Ecuadorean Standards Institute
454 Baquerizo Moreno St.
P.O. Box 17-01-3999
Quito, Ecuador
011-593-256-5626 FAX:011-593-256-7815
e-mail: <inenfu@andinanet.net>

**3000 European Region**

**3100 Ireland/United Kingdom**

TBD

**3200 Nordic**

Haakan Nilsson
Swedish Nat. Test. & Res. Institute Measurement Technology
P.O. Box 857
Boras, Sweden SE-501 15 46-33-16-53-87 FAX-46-33-16-56-20
e-mail: <hakahnilsson@smtp.se>

**3300 Southern Europe**

Jean Claude Krynicky
Agilent Technologies France
11 rue Ambroise Croizat
ZAE Les Glaises
Palaiseau, 91873 France
33-1-64-53-5617 FAX:33-1-64-53-5618
e-mail: <jean-claude_krynicky@agilent.com>

**3400 Central Europe**

Liviu Masalar
Metrology Lab. Univ. Liege
Chemin des Cheveuils 1, B52
4000. Liege, Belgium
32-4-3669168 FAX:32-4-3669166
e-mail: <l.masalar@ulg.ac.be>

**3500 Eastern Europe**

Ionel Udrea Marcus
National Institute of Metrology
11, Sos. Vitu-Barzesti
75669 Bucharest, Sect. 4, Romania
40-21-334-5060 x167 FAX:40-21-334-5345
e-mail: <curdea@inm.ro>

**4000 Middle East/Africa Region**

**4100 Egypt**

TBD

**4200 Near East**

TBD

**4300 South Africa**

Dr. Wynand Louw
CSIR - National Metrology Laboratory
P.O. Box 396
Pretoria 0001, South Africa
27-12-841-4227 FAX:27-12-841-2131
e-mail: <wlouw@csir.co.za>
22.12 AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
Roxanne Robinson
American Assn. for Lab Accreditation
5301 Buckeystown Pike, Suite 350
Frederick, MD 21704
(301) 644-3208 FAX(301) 662-2974
e-mail: <robinson@asla.org>

22.15 INTERNATIONAL MEASUREMENT CONFEDERATION (IMEKO)
Chester Franklin
CSC Norco
2727 Hammer Ave.
Norco, CA 92860-1995
(951) 313-3866 FAX(951) 736-7390
e-mail: <cfranklin@cscnorco.com>

22.19 AMERICAN PHYSICAL SOCIETY
Dr. Klaus Jaeger
Jaeger Enterprises
13685 Calle Tacuba
Saratoga, CA 95070-4918
(408) 867-1743 FAX(408) 867-3705
e-mail: <jaegerenterprises@comcast.net>

22.21 INTERNATIONAL LABORATORY ACCREDITATION COOPERATION (ILAC)
Anthony Anderson
Gulf Calibration Services, Inc.
103 Commerce St., Suite 160
Lake Mary, FL 32746
(407) 333-3327 FAX(407) 333-3309
e-mail: <anderson@ncsli.org>

22.26 ASIA/PACIFIC METROLOGY PROGRAM
Dr. Takashi Usuda
Natl. Metrology Institute of Japan
1-1-4 Umezono, Tsukuba Science City
Ibaraki, Japan 305-8563
81-298-61-4363 FAX:81-298-61-4393
e-mail: <s-apmp@maist.go.jp>

22.27 ASSOCIACION MEXICANA DE METROLOGIA (AMMAC)
Roberto Benitez
MetroLab S.A. de C.V.
Alfonso Reyes #2620
Fracc. B. Reyes
Monterrey, N.L. 64280 Mexico
52-81-8-702600 FAX:52-81-8-129-4646
e-mail: <roberto@metrica.com.mx>

22.28 AMERICAN SOCIETY FOR QUALITY (ASQ)/MEASUREMENT QUALITY DIVISION
Christopher L. Grachanen
Hewlett Packard Co.
Corporate Metrology, MS: 070110
P.O. Box 692000
Houston, TX 77070-2698
(281) 518-8486 FAX(281) 518-7275
e-mail: <chris.grachanen@hp.com>

22.29 NORTH AMERICAN CALIBRATION COOPERATION/ NORTHERN AMERICAN METROLOGY COOPERATION (NACC)
Doug Faison
NIST
Stop 2140
100 Bureau Dr.
Gaithersburg, MD 20899-2140
(301) 975-5304
e-mail: <faisonnd@nist.gov>

22.30 INSTITUTE OF ENVIRONMENTAL SCIENCE & TECHNOLOGY
Robert L. Melkie
Abbott Laboratories
Dept. 736, M4
1400 Sheridan Rd.
N. Chicago, IL 60064
(847) 938-9111 FAX(847) 937-4634
e-mail: <robert.melkie@abbott.com>

22.31 JLC/CCG
Arman Hovakimian
Naval Surface Warfare Center
MS00
P.O. Box 5000
Corona, CA 92878-5000
(951) 273-5221 FAX(951) 273-4904
e-mail: <arman.hovakimian@navy.mil>

22.32 SII/SAIF
Peter Unger
American Assn. for Lab Accreditation
5301 Buckeystown Pike, Suite 350
Frederick, MD 21704-8373
(301) 644-3212 FAX(301) 662-2974
e-mail: <puunger@asla.org>

22.35 BRAZILIAN SOCIETY OF METROLOGY (SBM)
Julio Felix
Sociedade Brasileira de Metrologia
Av. Nilo Pecanha, 50 - Grupo 2517
Rio de Janeiro, RJ 20020-906 Brazil
5521-544-5751 FAX:5521-544-5527
jfelix@hospitalidade.org.br

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

**PUBLICATIONS PRICE LIST -- 2006**

<table>
<thead>
<tr>
<th>Standards:</th>
<th>Members</th>
<th>Non-Members</th>
<th>Available Formats</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI/NCSL Z540-1-1994 (R2002)</td>
<td>40.00</td>
<td>90.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>(Calibration &amp; Measurement &amp; Test Equip. General Requirements)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANSI/NCSL Z540-1-1994 Handbook</td>
<td>40.00</td>
<td>90.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>(U.S. Guide to the Expression of Uncertainty in Measurement)</td>
<td>70.00</td>
<td>90.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>ANSI/ISO/IEC 17025: 2005</td>
<td>70.00</td>
<td>90.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>(General Requirements for the Competence of Testing and Cal Labs)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NCSLI Recommended Practices:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RP’s on CD-ROM</td>
<td>200.00</td>
<td>400.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-1 “Establishment &amp; Adjustment of Calibration Intervals” (1/96)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-3 “Preparation of Calibration Procedures” (1/90)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-6 “Calibration Control Systems for the Biomedical and Pharmaceutical Industry” (5/99)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-7 “Laboratory Design” (11/00)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-8 “An Individual Equipment Evaluation Guide” (10/88)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-9 “Calibration Laboratory Capabilities Documentation Guidelines” 7/89</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-10 “Establishment &amp; Operation of Electrical Utility Metrology Laboratory” (1/04)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-12 “Determining &amp; Reporting Measurement Uncertainties” (4/95)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-13 “Computer Systems in Metrology” (2/96)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-14 “Guide to Selecting Standards-Laboratory Environments” (3/99)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RP-15 “Guide for Interlaboratory Comparisons” (3/99)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NCSLI Recommended Intrinsic/Derived Standards Practices:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>RISP’s on CD-ROM</td>
<td>50.00</td>
<td>150.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RISP-1 “Array Josephson Junction” (1/02)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RISP-2 “Triple Point of Water Cell” (5/95)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RISP-3 “Quantized Hall Resistance” (8/97)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RISP-4 “Deadweight Pressure Gauges” (7/98)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>RISP-5 “Two-Pressure, Two Temperature Humidity Generator” (3/02)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>Catalog of Intrinsic and Derived Standards (3/99)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Laboratory Management Publications:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory Management Publications CD</td>
<td>100.00</td>
<td>200.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>Calibration Laboratory Manager’s Guidebook (11/90)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>Acronym List (7/99)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>NCSLI Glossary of Metrology-Related Terms (9/99)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>1999, 2001, or 2003 Benchmarking Survey (PDF Only)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>U.S. or Canadian Nat. Meas. Req. Comm. Report (on Lab Mgmt. CD only)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>Guide to Achieving Laboratory Accreditation (3/02)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>Companion Volume to Guide to Achieving Lab. Accred. (4/04) (PDF only)</td>
<td>75.00</td>
<td>150.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>Guide to Measurement Uncertainty for Calibration Laboratories – DRAFT</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NCSL Workshop &amp; Symposium Proceedings:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-1997 Composite (CD-ROM only)</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>1998, 2000, 2001 or 2002 (CD-ROM only) per CD</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>2003, 2004 (CD-ROM only) per CD</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>2005 (CD-ROM only)</td>
<td>100.00</td>
<td>200.00</td>
<td>CD, PDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Newsletter:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NCSLI Newsletter (single copy)</td>
<td>10.00</td>
<td>20.00</td>
<td>CD, PDF</td>
</tr>
<tr>
<td>One-year NCSLI Newsletter Subscription</td>
<td>20.00</td>
<td>50.00</td>
<td>CD, PDF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Duplicate or Replacement Plaques (members only)</td>
<td>100.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royal Egyptian Cubit &amp; Poster set (supply limited)</td>
<td>45.00</td>
<td>75.00</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Bound (HC) copies of all NCSLI publications are available only as supplies last. Otherwise, Print On-demand (OD) copies will be available at cost plus a $20.00 handling charge.*

Payment: Please remit payment with order (in U.S. funds only). Make checks payable to: NCSL International. Purchase Orders are accepted. Or charge to your Visa, MasterCard, Discover, or American Express by phone.

Shipping: Member prices include shipment to U.S. locations via U.S. Mail or UPS Ground. Non-Member and Overseas shipments are sent via U.S. Mail, UPS Ground, or by using an alternate courier. Contact the NCSLI Business Office for rates.
NCSL International is a nonprofit association of laboratories or organizations that maintain or have an interest related to measurement standards and calibration facilities. Each Member Organization appoints a “Member Delegate” who has the responsibility of representing the member company or organization in NCSL International.

Member Company or Organization (Enter name above as it is to appear on membership certificate and wall plaque)

<table>
<thead>
<tr>
<th>Member Delegate information:</th>
<th>Appointing Officer* information:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Member Delegate’s Name</td>
<td>Appointing Officer’s Name</td>
</tr>
<tr>
<td>Title</td>
<td>Title</td>
</tr>
<tr>
<td>Department or Division</td>
<td>Department or Division</td>
</tr>
<tr>
<td>Delegate’s Business Mailing Address</td>
<td>Mailing Address (if different from Member Delegate)</td>
</tr>
<tr>
<td>City</td>
<td>City</td>
</tr>
<tr>
<td>State</td>
<td>State</td>
</tr>
<tr>
<td>Postal Code</td>
<td>Postal Code</td>
</tr>
<tr>
<td>Country</td>
<td>Country</td>
</tr>
<tr>
<td>Telephone Number</td>
<td>Telephone Number</td>
</tr>
<tr>
<td>Extension</td>
<td>Extension</td>
</tr>
<tr>
<td>Fax Number</td>
<td>Fax Number</td>
</tr>
<tr>
<td>E-mail address</td>
<td>E-mail address</td>
</tr>
<tr>
<td>Company’s URL Address</td>
<td>Signature of Appointing Officer</td>
</tr>
<tr>
<td></td>
<td>Date</td>
</tr>
</tbody>
</table>

*The Appointing Officer is the individual from the above company who is appointing the Member Delegate, and is usually the Member Delegate’s supervisor.

- New Corporate Member Fee (Jan-Dec 2005) $400
- New Educational Institution Member Fee (Jan-Dec 2005) $400

New Membership above plus annual dues renewal (Advance payment is guaranteed at $325 per year. No refund for advance payment.)
- New Member $400 + 2006 dues $325 = $725
- New Member $400 + 2006/2007 dues $650 = $1,050
- New Member $400 + 2006/2007/2008 dues $975 = $1,375
- New Member $400 + 2006/2007/2008/2009 dues $1,300 = $1,700

No Purchase Orders...Please

Please remit with Application the amount shown above (in U.S. funds).
Make checks payable to: NCSL International.

Or charge your: ___ Visa ___ MasterCard ___American Express ___Discover

Full name as it appears on card

Card Number: ___________________________ Expiration Date: __________

Date: ___________ Signature: __________
NCSL INTERNATIONAL STAFF

Craig Guilka  
Business Manager  
<cgulka@ncsl.org>

Joan Wilshire  
Office Manager  
<jwilshire@ncsl.org>

Doris Schaffer  
Admin. Support Asst.  
<dschaffer@ncsl.org>

Larry Johnson  
Computer Specialist  
<lajohnson@ncsl.org>

NCSL International Business Office  
2995 Wilderness Place Suite 107  
Boulder, CO 80301-5404  
(303) 440-3339  
Fax: (303) 440-3384  
NCSLinfo@ncsl.org

NEWSLETTER EDITORIAL SCHEDULE FOR 2006

<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>Jan 06</td>
<td>10 Jan. 06</td>
<td>15 Dec. 05</td>
<td>1 Dec. 05</td>
</tr>
<tr>
<td>Apr 06</td>
<td>10 Apr. 06</td>
<td>15 Mar. 06</td>
<td>1 Mar. 06</td>
</tr>
<tr>
<td>Jul 06</td>
<td>10 Jul. 06</td>
<td>15 Jun. 06</td>
<td>1 Jun. 06</td>
</tr>
<tr>
<td>Oct 06</td>
<td>10 Oct. 06</td>
<td>15 Sep. 06</td>
<td>1 Sep. 06</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

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

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

Abstracts are required for Workshops, Panels, and Papers. For more information contact:  
NCSL International Business Office  
2995 Wilderness Place, Suite 107  
Boulder, CO 80301-5404  
(303) 440-3339  
Fax: (303) 440-3384  
E-mail: <info@ncsl.org>

NCSL MEETING PLANNER

Tom Huttemann  
170 Chicahauk Trail  
Southern Shores, NC 27949  
(252) 255-1690 FAX(252) 255-1927  
e-mail: <thuttemann@aol.com>

BOARD OF DIRECTORS’ MEETING DATES

October 24-26, 2005  
Radisson Plaza Hotel  
Myrtle Beach, SC

January 16-18, 2006  
Marriott San Antonio River Center  
San Antonio, TX

April 24-26, 2006  
NCSLI Headquarters  
Boulder, CO

August 6, 11-12, 2006  
Renaissance Nashville  
in conjunction with the NCSLI International Workshop & Symposium, August 6-10, 2006

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. The Publications Club grants NCSLI organizational member delegate the right to post NCSLI publications on an Intranet site for the Publications Club annual fee. Posting publications for organization use - without authorization - is a violation of the NCSLI copyright policy regarding 1) unlimited distribution and 2) systematic and multiple reproduction. Contact the Business Office for details - (303) 440-3339. See inside for application, or visit the NCSL International web site at <www.ncsl.org>
NCSLI International thanks the following companies for their sponsorship of the 2005 Conference in Washington, DC:

**Platinum Sponsors:**

- NIST
  - National Institute of Standards and Technology
  - Technology Administration, U.S. Department of Commerce

- EDISON METROLOGY
  - Quality Assured Test Services

- Mudcats
  - Calibration Services

- GCS
  - Calibration Services

- DH·Budenberg
  - The Pressure Reference

**Gold Sponsors:**

- Agilent Technologies

- Interscan

- Boeing

- UI
  - Unified Industries Incorporated

- Mensor

**Silver Sponsors:**

- Tour Andover

- Northrop Grumman

- Lockheed Martin

**President’s Reception Sponsor:**

- FLUKE