JULY 2006

NCSLI Newsletter

NCSL International

Serving the World of Measurement Since 1961

NCSLI's 45th Anniversary Special Commemorative Edition

NCSL International 1961 – 2006

Special 45th Anniversary Commemorative Edition July 2006

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On the cover: Most convention city photos courtesy of their local convention bureaus. Toronto picture credit of Tourism Toronto.

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Editor's Message

A Year in the Life of NCSLI

John Minck
Editor

What is NCSL International? It is one year of professional challenges and personal friendships. **45 Times!**

So here is a problem for you. Try to think of a SINGLE photo which will represent the essence of the global operations and reach of NCSLI! I'll give you 1 minute.

Not so easy is it? I thought of the front lawn shot of our business office. I thought of the friendly gatherings of our annual conference receptions. Of the crowded technical sessions. Of the networking that our members were experiencing throughout the exhibit floor. Of the technical and business interactions with major global standards organizations. I thought of the dozens of our regional meetings around the world.

As I began the early plans for this 45th anniversary issue, I decided to browse through the last 20 issues of the newsletter going back to 2001. I found it very difficult to portray the global activities of NCSLI in just a few photos. So I concluded that perhaps a "photo essay" might do a better job in recounting just how important our work is in this global metrology environment. It's a direct steal from "A Day in the Life of America." The story starts on page 15a.

So happy 45th birthday NCLSI. You've done well for middle age.

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PRESIDENT'S MESSAGE

Jeff Gust
NCSLI President

Serving the World of Measurement for 45 Years

As NCSL International celebrates its 45th anniversary, it is important for us to take a moment to reflect on the accomplishments of our organization.

One of our organizations earliest historical documents states: "The Conception of an "association of standards laboratories" was presented to a group of people active in the precision measurements field at a special meeting in Boulder, Colorado, subsequent to the final meeting of the 1960 Conference on Standards and Electronic Measurements at the National Bureau of Standards – Boulder Laboratories." Some of the original topics of discussion were:

- Obtaining and/or training measurement specialists
- Dissemination of information pertaining to measurement techniques and to the operational management problems of measurement activities
- Establishment and acceptance of recognized capabilities of laboratories active in the measurements fields

Some of the big issues in 1960 that drove the establishment of the National Conference of Standards Laboratories are still some of the big issues for us today. NCSLI has played a major role in each of these activities, using our annual workshops as a place to provide training and dissemination of information on measurement techniques. The acceptance of recognized capabilities of laboratories is now called Laboratory Accreditation. NCSLI has developed many documents pertaining to the concept of Laboratory Accreditation, and presently Roxanne Robinson, Vice President of the American Association for Laboratory Accreditation, is a member of the NCSLI Board of Directors.

Since many of the major accomplishments of our organization have been covered in previous anniversary publications such as our 40th anniversary newsletter, I would like to focus on our more recent history. In the years since our 40th anniversary, the world has become a smaller place. Almost every member of NCSLI has witnessed the effects of globalization firsthand. Many companies have merged into a few large organizations. Other businesses have moved parts of their operations to other countries. For NCSLI to remain a vigorous organization, we have had to react accordingly.

In order to best serve the interests of our membership, NCSL International has put forth significant effort in making our organization truly representative of the measurement needs of the world. Since 2001, NCSLI has held our Board of Directors meetings in Canada and Mexico, and our Executive Board has met with Senior Staff at the INMS in Canada and CENAM in Mexico.

NCSLI has developed relationships with other pertinent organizations around the world, such as ILAC, where we supported our Past President and Wildhack Award winner Anthony Anderson for two terms as the Chair of the ILAC Laboratory Committee. NCSLI has established relationships with EUROMET, the organization of European National Measurement Institutes, and EUROLAB, the professional organization for European Test Laboratories. We now have EUROMET and EUROLAB representatives on our Board of Directors, and NCSLI is represented at their annual General Assemblies.

NCSLI's most significant accomplishment of the last five years is the formalization of a relationship with the International Bureau of Weights and Measures (BIPM), in which the Director of the BIPM, Professor Andrew Wallard, has become the BIPM representative to the NCSLI Board of Directors.

In addition to our international activities, the leadership of NCSLI has maintained a close relationship with NIST, with the Executive Vice President, President, and Past President meeting annually with NIST senior leadership.

NCSLI has worked hard to represent our membership by forming consensus positions of the membership through development of position papers on "Laboratory Accreditation, Registration, and Certification" and "SI Units."

NCSLI has also realized several initiatives in the last five years to increase member benefits. We have relocated our business office in order provide services such as a training facility for our members to use. The NCSLI website has been improved greatly to become a vital resource for measurement professionals. We have added Tutorials to our annual workshop and symposium to provide additional opportunities for training. As of March 2006, we have launched MEASURE, a new technical magazine that provides our membership with practical and up-to-date information on calibration techniques, uncertainty analysis, measurement standards and laboratory accreditation.

NCSLI has accomplished a great deal in the last five years; however, none of this would have been possible without the efforts of every person who volunteers their time to NCSLI and every organization that supports these volunteers. We come together, giving of ourselves to improve the world of measurement, doing our small part to make the world a better place in which to live.

Happy 45th Anniversary NCSL International

Jeff C. Gust
President

CONGRATULATORY MESSAGES

NIST | UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899
OFFICE OF THE DIRECTOR

MAY 0 9 2006

Mr. Jeff Gust
President, NCSLI
Quametec Proficiency Testing Services
501 West Van Buren, Unit A
Columbia City, IN 46725

Dear Mr. Gust:

I am delighted to congratulate NCSL International (NCSLI) on its 45th Anniversary. This year's Workshop and Symposium in Nashville, TN, is a unique opportunity for NCSLI to celebrate its contributions to the world of metrology.

As society becomes increasingly dependent upon the technological infrastructure provided by measurements and standards, the programs of the National Institute of Standards and Technology (NIST) must rely heavily upon NCSLI and other organizations to meet critical U.S. measurement needs where rapid technological change and complexity are constants. Indeed, the 45th Anniversary of NCSLI is a unique opportunity to thank the multitude of member organizations for 45 exciting years of collaboration with NIST for the benefit of industry, science, and technology.

As the measurement community addresses the measurement needs of the 21st century, I am confident that NCSLI and NIST will grow and strengthen our partnership. Working together to provide the measurements and standards needed to foster innovation and support competitiveness will benefit all our stakeholders—in industry, government, and academia.

Best wishes for a successful and memorable anniversary year.

Sincerely,

William Jeffrey

William Jeffrey
Director

19 May 2006

FROM THE DIRECTOR
TO: Mr Jeff Gust, President, NCSLI

Dear Jeff,

I'm delighted to have the chance to offer my personal congratulations, as well as those of the BIPM, to NCSLI on its 45th Anniversary.

I've had the pleasure of being involved with NCSLI for more than 10 years and have always found the annual Conferences to be a high point of the metrological year. More recently, I've had the honour of representing the BIPM on your Board of Directors.

NCSLI is, I believe, unique. It builds bridges between the laboratory world and the metrology infrastructure at a national as well as an international level. I find it a quite remarkable and lively group which gives me a chance to pass on the latest news from the BIPM as well as to listen to informed and thoughtful views from the laboratory and industrial metrology world which we all serve.

I wish you well for the future and look forward to continuing collaboration under the letter of agreement which I signed with Mr Charles Motzko when he was President in 2002.

With best wishes

Andrew Wallard

ANDREW WALLARD

BUREAU
INTERNATIONAL
DES POIDS ET MESURES

ORGANISATION
INTERGOUVERNEMENTALE
DE LA CONVENTION
DU METRE

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International Laboratory Accreditation Cooperation

www.ilac.org

25 April 2006

Mr Jeff Gust
President, NCSL International
2995 Wilderness Place #107
Boulder, CO 80301

Dear Mr Gust,

On behalf of the International Laboratory Accreditation Cooperation (ILAC) I am very pleased to have the opportunity to congratulate NCSL International on the occasion of your 45th Anniversary.

The importance and value of laboratory accreditation is being increasingly recognised by regulators and industry specifiers, as is the importance of having reliable and traceable measurements to underpin the accreditation process. The role of NCSL International, in promoting and supporting the importance of reliable calibration and traceable measurements in the global conformity assessment community has been substantial. On the occasion of your 45th Anniversary I am pleased to acknowledge this valuable contribution on behalf of ILAC.

ILAC and NCSL International have had close links for many years, with NCSL International holding Stakeholder status in ILAC and actively participating in the work of the ILAC Laboratory Committee. This link was further strengthened in 2003 when Mr Anthony Anderson, NCSL International representative on the ILAC Laboratory Committee, became the Committee Chair and took up a seat on the ILAC Executive Committee.

In closing, I would like to thank NCSL International for your continued support of the work and objectives of ILAC and for your dedication to the promotion and maintenance of a reliable and traceable measurement infrastructure.

Congratulations and continue with the good work.

Yours sincerely

Daniel Pierre
ILAC Chair

ILAC:SEC-218.0.2006(NCSLI letter)

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METROLOGY TRENDS FOR THE FUTURE– A VIEW FROM AN NMI

Belinda L. Collins, Ph.D.
Director, Technology Services
National Institute of Standards and Technology

What might the next five years and beyond hold for NIST and other National Measurement Institutes (NMIs) - and the entire measurement community world-wide?

We can be certain of one thing: there will be change! We can expect change not only in what we provide, but also in the **ways in which** we provide measurements and metrology services. We can anticipate changes in measurement capabilities - and the need to provide ever new capabilities to address such issues as nanoscale measurements.

We have already seen some convergence of unrelated scientific disciplines, and can expect further combinations of biology, chemistry, and physics applied to emerging technologies and industries, including nanotechnology and biotechnology. These will pose new questions about how to measure their combined impact on the performance and safety of existing and new materials.

Need will drive change in the ways in which we listen to, learn from, and work with colleagues in industry, academia, and government agencies. At the same time, not every NMI will be able to make every measurement needed by its own economy, so we should expect increased collaboration among NMIs and with industry laboratories. We can anticipate, and work towards, greater synergy among the key players to create the standards needed to support the global economy.

In the following pages, I'll describe some ideas emerging from my, albeit imperfect and cloudy, crystal ball. We can revisit all this in 2011 to see how on target these predictions were!

Measurement Science

I'm going to begin with advances in measurement science and delivery, starting with the NMI at which I've spent my career. NIST recently revised its mission statement as follows:

> *To promote U.S. innovation and competitiveness by advancing measurement science, standards and technology in ways that enhance economic security and improve our quality of life.*

This mission focuses us squarely on metrology and standards. It is coupled with a long-range planning effort that concentrates on advancing measurement science to support innovation and competitiveness. Concomitant efforts will include creation and dissemination of physical standards and input into the documentary standards needed to support emerging technologies.

The areas that NIST is choosing for concentration are familiar to all of us from the daily newspaper, internet and TV. The first area, nanotechnology, involves the measurement science needed to enable nanotechnology from discovery to manufacture. NIST has just created its Center for Nanoscale Science and Technology to foster development of measurements and standards in support of nano-manufacturing and other technologies at the nanoscale. We are partnering with industry on appropriate user facilities at NIST/Gaithersburg, including the Advanced Measurement Laboratory, and at NIST/Boulder and elsewhere to strengthen and deepen our research focus.

The subject of new, reliable energy sources, including hydrogen fuels, is also of great public interest at this time. NIST recognizes that creating a viable hydrogen economy will require new measurements and standards, as well as the supporting technologies required to improve the efficiency, durability, and manufacture of hydrogen fuel cells. Standards and calibrations are needed for pipeline safety and reliability, as well as for the legal metrology infrastructure essential for commercial sales of hydrogen fuel. Ensuring that consumers actually receive the labeled amount of hydrogen fuel is complex … and every bit as challenging as for petroleum products.

The biotechnology and healthcare industries are hot areas that are badly in need of sound metrology to underpin advances in disease treatments, pharmaceuticals, and agriculture, to name only a few opportunities for NMIs. NIST is partnering with National Institutes of Health and the bio-imaging industry to improve molecular imaging for understanding bioprocesses and for assessing the behavior of biomaterials in the body. This effort is essential for developing the measurement foundation for converting pictures of biological materials and systems into data that can be used reliably for diagnosis and analysis.

At the other end of the bio-spectrum is the need for measurement data and procedures for biometrics for identifying individuals, helping us to protect our borders and moving people through checkpoints more efficiently. NIST has already developed expertise in face recognition and fingerprints … but the development of new standards and test methods will be required to use this technology effectively.

The 20th century was dominated by advances in computing power, and we can anticipate continuing advances as we move forward in the 21st century. NIST is poised to conduct revolutionary research in quantum information science; to develop new measurement tools and methods that can be applied to new, ultra powerful computers; and to achieve "unbreakable" codes to protect financial and other transactions.

This is accompanied by society's need for the measurement science and technologies essential for providing the cyber security that is required for protecting the nation's productivity and infrastructure including transportation systems, financial systems, power grids, etc. Earlier NIST research in encryption technologies is estimated to have saved these and other industries as much as $1B, but many more threats to cyber security remain to be addressed.

Although not all NMIs explicitly support the construction and building industries, NIST has a mandate to develop the measurements and standards for providing structural safety in hurricanes, fires, earthquakes and other disasters. This continuing effort calls for improvements in the modeling of measurements of extreme winds coupled with fire and smoke, as well as development of innovative techniques for earthquake-resistant design and construction.

We have worked collaboratively with Japan for more than 20 years on the measurements and standards needed to improve construction to resist fires and earthquakes - and to enhance human safety in the built environment. This collaboration has benefited people throughout the world as building codes have been enhanced to address issues of seismic safety and fire resistance.

NIST has long supported manufacturing innovation through measurements and standards for better supply chain integration. These ongoing efforts center on better exchange of product designs and data through improved standards and test methods (ensuring compatibility with international standards). Along with other research institutions and NMIs, NIST has worked to embed our research findings and technologies into the standards needed by industry to create tomorrow's products and systems. We will continue these joint endeavors to ensure that industry standards are accepted globally.

These advances in measurement science and standards recognize the need for NIST and other NMIs to focus on new types and approaches to the measurements and standards to support competitiveness and innovation!

Learning from our customers and stakeholders

The foregoing concepts have arisen from the practitioners of measurement science, but additional ideas stem from customer needs and requirements. To assess these, NIST recently embarked on an ambitious review of the U.S. Measurement System (USMS) to determine how we can effectively address the multiplying needs for ever-more-exacting and more reliable measurement tools and associated services to support innovation. NIST is working with stakeholders across the U.S. to identify unmet or emerging needs for measurements to support emerging technologies of all types - from nanotechnology to biotechnology to energy to information technology and beyond.

Technological innovation sustains U.S. competitiveness in the world while underpinning national security and defense. It has accounted for half of our economic growth, with productivity in "high tech" manufacturing growing three times as fast as for manufacturing as a whole. Measurements are needed to support innovation and growth. Test-equipment manufacturers, standards developers, product certifiers, accredited laboratories and all participants in the measurement system at the national level will have to address these issues.

NIST has surveyed the USMS from different cross-cutting perspectives, including specific sectors, technologies, SI Units, and disciplines to explore measurement needs and the state of the entire U.S. measurement system. We plan to report specific industry measurement needs, analysis of trends and commonalities among specific innovation-limiting measurement needs, findings on the state of the system, and any identified systemic problems, with recommendations for follow-up actions that will achieve solutions.

The NIST report will help to focus stakeholder attention on systemic issues that undermine the performance and utility of the whole system, catalyze further efforts to identify measurement needs and systemic problems that weren't identified initially, and enable efficient use of both public and private sector resources to resolve measurement problems.

The analysis of all the data gathered in the USMS effort promises to provide a wealth of information that will assist NIST and other NMIs around the world as we plan to accomplish the measurements and standards that will facilitate innovative technologies over the next five years and beyond!

Collaboration to address measurement challenges

We should see much more enhanced collaboration in the years ahead. Others, such as Andrew Wallard, Director of the BIPM, have talked about collaboration among NMIs, but what about collaboration within an economy among different types of laboratories?

NIST has just initiated such collaboration with the Oak Ridge National Laboratory (ORNL) to promote measurement accuracy for nuclear medicine imaging driven by the need for calibrations of short-lived atomic species. In this effort, NIST scientists will use the NIST/ORNL Nuclear Medicine Calibration Laboratory to prepare and measure radioactivity standards used for Positron Emission Tomography (PET). PET is a non-invasive technique that helps doctors diagnose diseases (such as cancer), plan medical treatment, and measure the efficacy of therapies. In this procedure, a low-dose radiopharmaceutical (such as glucose molecules with radioactive particles attached) is injected and metabolized in the part of the body to be imaged by the PET scanner.

As the scanning technology has improved and image analysis has become more sophisticated, demand has grown for more precise determination of the administered dose. The NIST/ORNL program will for the first time provide direct traceability of these radioactivity measurements to national standards. The NIST program will be carried out regionally because the short half-lives of most PET radiopharmaceuticals prevent shipment of standard test samples over long distances. We anticipate the need for additional such partnerships in the future!

NIST has also had excellent success in collaborating with others in several unique NIST facilities, including the NIST Center for Neutron Research. We anticipate expanding this center to provide an additional cold source and new generation of world-class instruments to conduct research into protein structures and functions as well as trace chemical analysis.

Another opportunity for collaborative research is with the national synchrotron light source at Brookhaven national lab where joint work in imaging and analysis of chemical, electronic and structural properties will support the development of innovative materials

NIST has previously discussed the capabilities of the Advanced Measurement Laboratory (AML) with NCSLI members; suffice it to say that the AML is being extensively used to support not only metrology for nanotechnology, but for all technologies requiring precision control over the environment in which the measurements are made.

Continued on page 22a

A MEASUREMENT MANUFACTURER LOOKS TO THE FUTURE OF METROLOGY

Preserving the Truth in Times of Continuous Change

John Herniman
V.P. Quality, EMG
Agilent Technologies

We all operate amidst the turmoil and challenges driven by industrial globalization, technology evolution, and regulatory expansion. Fortunately, we can feel pride and stability in being affiliated with calibration laboratories that have unwaveringly addressed "metrology," the art and science of identifying, measuring, maintaining, and reporting the truth.

Market-driving forces that disrupt processes, redistribute staffing, alter geographical deployment, change hardware and software architectures, and mandate compliance to complex standards have direct effects on the business condition of a worldwide OEM supplier of measurement technology. These forces also significantly impact the hardware, software, and intellectual property (IP) an OEM must provide to customers so that they too can successfully contend with the same forces in the context of their own business environments.

The geographic diversification of manufacturing and R&D for many companies has created a challenge in maintaining quality and consistency. "New products designed in one country may be prototyped in another and manufactured in yet another or even on another continent," said our Pat Byrne, president of Agilent Technologies' Electronic Measurements Group. "The push to take advantage of the rich diversity of talent across the globe has increased our dependence upon robust measurement tools and techniques to ensure that the performance inherent in designs from the country of origin are maintained across the world at the end of the production line."

As financial operating margins have thinned, companies involved in research or manufacturing are relying upon metrology to "remove all doubt" as they make decisions on product performance, reliability and predictability. Calibration labs, whether internal parts of a company or external service providers, serve a critical need in reducing the risk of product and process failure and thereby in assuring the financial health of the companies they serve.

Product reliability and accuracy must meet market expectations for a company to maintain the loyalty of its customers. In addition, and process reliability must meet internal expectations for a company to maintain its profitability and the loyalty of its stockholders. It is with this knowledge that metrologists and calibration laboratory personnel can strive to maintain the robust tools and techniques needed to characterize the ever-broadening set of truths to be addressed. The tools and techniques must be portable, delivering consistent results worldwide.

If technology would stand still, metrology could ultimately prevail over all the problems that contribute to the risk of measurement error. Yet, the evolution of technology continues to accelerate, introducing both new challenges and new solutions to the world of measurement. Over the last few years, the most noticeable change has been in the blurring of the lines between the analog and digital worlds. As the size, cost and power consumption of digital components has dropped, the speed of those same components has increased even more dramatically. Measurement hardware that once could be realized only in analog form can now be implemented digitally with processing bandwidths that fully address major sets of measurement requirements.

Some measurement errors such as logarithmic amplifier accuracy in spectrum analyzer IF sections - errors that metrology once had to address - have been eliminated since that function is now performed by Pentium-class processors. Still, the perfect digital measuring instrument - a single super-fast ADC with enough linearity and resolution to cover any application - is yet to be achieved. Instead, combined analog/digital solutions are often still required to measure and characterize some phenomena.

The use of digital technology has enabled manufacturers to squeeze ever greater performance out of hardware components. These are characterized during design and manufacture, and compensation for their behavior (even drift) is included in normal instrument operation. As a result, customers can now buy more measurement capability for their money because some hardware is now replaced with software algorithms, increasing performance and reliability while simultaneously driving down manufacturing costs.

The move to software-intensive architectures introduced challenges of its own, of course. Just as you can no longer adjust the mixture in the carburetor of your automobile (most have long since gone to microprocessor-controlled fuel injection), you no longer find "screwdriver tweaks" in your measurement instruments. The specified performance of the instruments depends on providing real-time compensation for component drift or aging. Adjusting the actual performance (if verified as inadequate) requires complex closed-loop iterative calculations to characterize the components and change the measurement loop calculations.

The robust measurements used to verify the overall performance of today's instrument must be able to feed back the results into an automated routine that uses them to make the necessary algorithmic adjustments. What once could be adjusted in a calibration lab with perhaps a scope and a screwdriver must now be done under automated control using external lab standards. On the plus side, though, no amount of manual tweaking could approach the instrument performance made possible by today's microprocessor-controlled architectures.

The increased performance of today's instruments manifests itself in other changes in the typical calibration lab. OEMs gain a competitive advantage by squeezing more performance out of hardware and

thereby tightening the instrument specifications. As the specs tighten and the feature sets increase - due in large part to digital signal processing - the process of completing a "performance verification" often entails an increasing number of tests and test points. Manual calibration procedures that formerly were reasonable have grown to be untenable for many modern instruments. In particular, "general purpose" instruments have extremely broad sets of functionality, all of which must be verified in the absence of specific advance knowledge of how the product will be used. Automatic calibration routines are virtually mandated if the performance verification is to be completed with high confidence in reasonable time.

This is especially important for mission-critical instruments, which cannot be removed from service for extended periods without adversely impacting costs, schedules or both. Should something drift out of alignment, the automated routines can be used to provide the necessary data for adjustment, and the instrument can be returned to duty with minimal delay. For those reasons, every instrument introduced by Agilent must have calibration procedures that can be supported in our Service Centers at the time of introduction, with full traceability to SI units. In addition, we are making the required engineering investments to make those procedures available to equipment owners who prefer not to (or simply cannot) take advantage of our support services. Robust, automatic routines for both calibration and adjustment are critical tools for calibration labs that support modern instrumentation for equipment owners interested in minimizing turnaround time and overall support costs.

Perhaps the largest visible change in recent years has been the surge toward Web-based business. Web technology plays a critical role in providing global transportability of tools, manufacturer's intellectual property, and information. Current software tools can be downloaded from secure web sites, licenses for the use of IP can be purchased and delivered online, and data reports can be transmitted electronically and formatted to fit specific customer needs if they are to be printed.

Identical tools can be deployed worldwide, identical judgments can be applied in determining pass/fail, and identical techniques can be used to adjust or repair instruments that do not pass with the required margin. Whether operating on two systems, in two buildings, or across two continents, consistency is the key to credibility, and the entire metrology business is founded upon credibility. Automation in calibration can provide the same benefits automation pays in a manufacturing operation - speed, repeatability, and consistent accuracy. Calibration results can be more readily used to improve business results.

"But who checks the checker?" is a common question we get. Equipment suppliers strive for the highest possible performance and reliability, but things change; components age, environmental conditions vary, and unintentional abuse may occur. Calibration labs exist to ensure that the equipment in question can be compared to certified standards, and automated tools may ensure that comparison can be consistently performed. But who checks to make sure the tools are correctly applied, or that uncertainty analyses are properly performed, or that the end customer can indeed be confident his service provider has removed all doubt?

In large part, that role has been taken on by certifying and regulatory agencies.

The advent of international standards like ISO/IEC 17025 or the mandate of compliance with standards such as ANSI/NCSL Z540 have helped to unify terminology and document conditions under which calibrations are made. Convergence on the ISO Guide for Expression of Measurement Uncertainty (GUM) has had the benefit of stating under which conditions measurement uncertainty calculations are to be performed, and in what manner they are to be performed if they are to be considered "in compliance."

Accreditation bodies worldwide need our support in maintaining the credibility of our industry. No one wants to bear the burden of bureaucratic oversight, but we cannot afford to devalue in any way our hard-earned accreditations by allowing slipshod enforcement of the underlying standards. Even the most carefully written regulations or standards leave room for interpretation, so it falls to the metrology community to provide some level of self-policing to ensure that robust process control is maintained, and that "softer services" such as uncertainty calculations are developed and used in appropriate fashion.

That, of course, places an additional burden on anyone developing automated calibration routines because uncertainty calculations are complex. They depend heavily on the equipment being used as lab standards and, in many cases, on the internal operating conditions of both the lab standards and the instrument under test. The ultimate is, of course, dynamic measurement uncertainty calculation, which requires point-by-point computation as the calibration process proceeds. While this is made possible by automatic calibration routines, it is computationally intensive and requires careful development - but in the end it provides the highest confidence in pass/fail results. It also provides the highest degree of flexibility when choosing between various lab standards without compromising results.

Equipment suppliers and calibration software providers must work to present their products using industry-accepted standards for communication and computation to allow for the broadest possible set of lab standards and tools. Object-oriented design techniques can be used in both hardware and software to provide standard interfaces and minimize interactions. This makes it possible to substitute lab standards when needed, while still maintaining the highest level of calibration quality. Technology does not stand still, but much can be done to standardize on equipment and techniques that will minimize the expense when a calibration lab must install a new measurement capability. Change is inevitable, but we can control the cost of evolution through careful adherence to software and hardware standards.

Another common question is, "What does the future hold?" Pat Bryne's answer was, "Instruments will continue to get smarter and include an ever-increasing amount of digital signal processing. As that relates to metrology, that's good, because tasks performed digitally have great repeatability and are not subject to traditional calibration." However, as product functionality increases - for example digital I/Q modulation - some of the new "money specs" (those that matter most to end customers) can easily become more complex and require more exotic techniques for verification. Fortunately, the verification and adjustment software, along with other pertinent IP, can be easily moved from the equipment supplier to calibration labs in electronic form. Upgrades and repairs, coupled with targeted training, can all be delivered over the Web, making it possible to maintain a state of readiness that has never before been available when such deliveries had to be made via snail mail, printed manual, or classroom chalkboard.

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CELEBRATING NCSLI AT FORTY FIVE YEARS YOUNG: AN INSTITUTIONAL AND ORGANISATIONAL PERSPECTIVE ON THE FUTURE

Andrew Wallard,
Director of the International
Bureau of Weights and Measures (BIPM)
Sèvres, France

Forty five years ago, I was still at school grappling with the new-fangled International System of Units (SI) which replaced the old metre-kilogram-second-ampere (MKSA) system. The definition of the metre had just moved away from being based on a bar artifact to a definition based on the number of wavelengths of light. The second was a fraction of the tropical year. And the kilogram was (and still is!) a lump of platinum-iridium alloy. Metrology was primarily concerned with physics and engineering and there was virtually no chemistry--the SI mole wasn't added until 1971.

How times have changed!

When invited to contribute this short article, John Minck asked me to make a few remarks on the institutional aspects of world metrology. He wanted the theme of this 45th anniversary issue to look at the challenges to come, as well as, of course, to celebrate the achievements of the past.

For metrologists at the BIPM and the National Metrology Institutes, or NMIs, the need to be forward-looking is a normal part of our life. We always have to be one step ahead of the game; and the game normally wants a doubling of accuracy every ten years or so. If we aren't looking at least ten years ahead, we're probably not doing our job as well as we could be. Metrology, as we all know, requires a patient and careful approach to our work. It's a time-consuming business.

At the national or international standard level, these experiments--especially those to develop a new realization of a unit--frequently take a substantial proportion of a scientist's career. I vividly remember arriving at the UK's National Physical Laboratory, wet behind the ears from a University course and from experiments which could be completed on a Wednesday afternoon. I thought that my project, which was to develop a stabilized laser which could be used to realize a new definition of the metre, might, if it was really difficult, take a few weeks. It took ten years.

At that time, I never really thought about the formal bodies of the international framework which provided, and which still provide, for consistent measurements throughout the world. I was a young scientist, wasn't I, and don't young scientists just think about their research….

Forty years on, here I am at the head of the body which provides the coordination of the work of NMIs from 51 Member States of the Metre Convention and 20 Associates of the General Conference on Weights and Measures! I like to think that maturity and middle age have brought an appreciation of structures and international issues. I don't, however, imagine--even remotely--that today's young scientists think any more about them than I did. And maybe realism, or skepticism, suggests to me that neither do many of the metrologists in NCSLI member laboratories as they work away at providing traceable calibrations for customers. So if this article accomplishes anything, it should offer a glimpse of the sort of things we do, and the way in which we'll develop in the decades to come.

The BIPM is one of those bodies which, if it didn't exist, would have to be created. Someone has to take responsibility for the integrity of the SI and help it develop to meet national needs. Someone needs to be responsible for the comparisons of national standards that are essential if we are to know if there are any differences at national levels, and if these matter for science or for trade. And someone has to look after the international kilogram, made in the 1880s and still serving the world of measurement - although its days are numbered.

We were created in 1875. Those of you that have been here, or have browsed our web site <www.bipm.org>, will know that our laboratories are based around a lovely old French "pavillon" overlooking the Seine. It's on international territory, surrounded by France--the police or fire brigade, for example, have to ask my permission to come in! The metrologist of 45 years ago would find us similar, yet very different. Similar, to the extent that the old responsibilities are still there, but writ even larger; different because of the major international efforts to define all the base units of the SI using fixed values of the fundamental constants.

These efforts may see the kilogram prototype finally consigned, after a good many innings, to history, like the metre bar. Different also, because of the huge emphasis on measurements related to trade and on chemical metrology, traceabilility in measurements for climate change, hospital medicine, food and drugs. My predecessors mainly concentrated on the science. But today's job is a mixture of science, politics, commerce and the challenges of persuading our partners in these new areas of application that a severe dose of traceability and measurement uncertainty can improve their health and make their work more effective

A real challenge for us all, though, is to worry about where tomorrow's metrologists, for tomorrow's businesses, are to be trained and the extent to which our Universities and Colleges cover metrology in their curricula. Few do, yet we know that good metrology brings practical benefits. The huge military training programmes rarely, if at all, exist these days, when outsourcing and the spinning-out of metrology labs is common business practice.

Optimistically, perhaps we shall see a swing back, and the big medical, pharmaceutical and food companies who nowadays drive so much of the added value in the world economy, will help sponsor training if they are convinced of the economic and business benefits. But it will be hard to convince them to do so. Our success stories are past history and, as ever, metrology is a relatively unglamorous

and unsung activity. Personally, I don't think we sing our own praises loudly enough to tell others of the excitement which is at the heart of metrology. Whether it's the understanding of what to do to help make a process line deliver a better product or, whether, as Steve Chu said, when delivering one of his post Nobel-prize speeches, "accurate measurement is at the heart of physics, and in my experience new physics begins at the next decimal place." Tomorrow's metrologist will have to be a publicist.

So what else will tomorrow's metrologist and tomorrow's metrology organisation be doing? Belinda Collins' NIST contribution to this edition may let us into some of these perhaps not-too-closely guarded secrets. For me, the institutional, as well as the scientific, challenge of the next decade or so is to deal with the still - evolving needs of the traditional areas, whilst at the same time coping with the new ones. Nothing stands still in our world. In engineering, it's noticeable that many "quantum-based" standards (stabilized lasers, Josephson voltage sources, atomic clocks) are becoming relatively commonplace and commercial devices can be found pretty close to the shop floor.

Ten years ago, they were still in the national laboratories and required the green fingers of experienced metrologists to squeeze the best out from them. They're still not easy systems to operate and there are many possibilities of error if they need to perform at, or near, the highest levels. So one of our challenges is to recognise the developing competences in the best high-tech companies. NCSLI is already addressing some of this through its voltage comparisons but it seems to me, it is just the beginning of a trend that could see national standards-level capabilities become the best industrial levels. The other trends which Belinda will no doubt highlight are the new manufacturing technologies at the nanoscale, where it is still not clear what the calibration needs at the national and international level are.

The process side of our work is also challenged by an increasing dependence on Information Technology and software. Already the internet is making it possible for some instruments to be calibrated remotely and some national accreditation bodies are accepting internet - based calibrations as evidence of traceability to the SI.

Finally, I suspect that tomorrow's metrologists will be pressed harder and harder to deliver smaller uncertainties on a routine basis. This matters enormously where large sums of money are involved in areas like flow or commercial lighting, and where NMI's don't have that traditional comfort factor of a factor of ten or so away from what industry needs.

In the ionizing radiation world, there will clearly be new needs in homeland security, but as more and more of us require radiation therapy, then medical practitioners will want better diagnostics and smaller uncertainties so as to treat cancers more effectively. Better uncertainties reduce the death rate and better control gives clinicians better data on which to evaluate treatments. As we all worry about healthcare when we travel, international consistency of the delivered dose is becoming more crucial. In some areas like accelerator therapy we can't yet give the same level of control as in X-ray dosage from cobalt 60 or similar sources. But the accelerator-based treatments are more attractive medically and are moving into our hospitals, so more effort is still needed.

Gas metrology is now fairly well established as a core metrology discipline but we need to develop our organizational links and commitments with those responsible for monitoring climate change and the effects of global warming. These are measurements of small changes in what can be large background measurement levels in a context in which it's essential to be 100% sure that what we want to measure **is** what we are measuring.

Traceability to the SI is essential, and yet there's not yet a single absolute radiometer in space to measure the real changes in the sun's activity--one of the most crucial factors in modeling. BIPM and the World Meteorological Organisation are teaming to address the problems but NMIs need dollar commitments to fly the necessary instruments in a world where the scientific competition for resources and launches is high.

Our standards writing colleagues in organisations like ISO or ASTM will also have to pay more attention to the metrology needs and consequence, of their work--especially where it is to be used in regulation or legislation. Tomorrow's metrologist has to be a canny seller of his or her expertise and has to convince colleagues, who have been "getting by" in other ways for decades.

Not many NMIs have in-depth skills in the "new" areas, and so need partnerships to collaborate with experts in the field. Metrology now needs the chance to show what it can do, and the first step is, and will be, to compare techniques or the results from comparisons. Many of these are held at the international level and reveal some surprises. But, often, simple attention to good metrological practice can reap dividends in better results. Some of the challenges, though, are not so easy. How are we going to deal with public concerns in areas like Genetically-Modified Organisms? The response of many legislators is to say "zero level." But legislators are not metrologists and I doubt if any metrologists are legislators.

How are we going to deal with rigorous and accurate DNA testing which may give insurance companies personal information which may make them reluctant to provide life coverage for certain people with the inherited potential for early life-threatening illnesses? How do we all deal with the notion of uncertainty and risk in a legal and legislative sense? To some extent it's a cultural, institutional and educational problem. But, just as was the case in legal metrology, the courts or the legislators want a yes/no, conformity assessment type approach--which is anathema to the metrologist who lives in a GUM world of uncertainty, probability, and sources of error.

It could be easy for an NMI or the BIPM to turn away from these difficult issues but then we fail our future world if we retreat to our traditional comfort zone. Institutional persuasion may therefore be the hallmark of much of the metrologist's work over the next decade or more. And we need to do it without frightening the general public who would feel better in a Panglossian risk-free world of certainty. Won't the "compleat" metrologist and the institutions in which he or she works, also need to be better at PR, better at communication and be better attuned to the needs and concerns of society? We have come to understand customers in the last quality-system driven 45 years: now we need to go a step further.

Continued on page 37a

A CONCISE HISTORY OF U.S. LABORATORY ACCREDITATION

Peter Unger
A2LA President

Foreword: Any history is colored by the author's access to source documents, and, in this author's case, his personal experience. The views expressed are his own. Any errors of fact or omissions are his responsibility and his responsibility alone.

Introduction

"Laboratory accreditation is like the weather. It comes in many varieties. It is much discussed; and nobody does anything about it; or more accurately, no one has yet found a way to control it." (Earl Hess, January 1986, ASTM Standardization News)

The international (and national) standard for accreditation bodies, ISO/IEC 17011:2004, defines accreditation as a third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks. For the purposes of this standard, conformity assessment includes testing, inspection, certification and, in the context of the standard, calibration. Both testing and calibration laboratories are included since procedures for assessing testing laboratories are used, with only a few additions, for assessing calibration laboratories and proper calibration of measurement processes is the foundation of competent testing.

The accreditation of laboratories in the United States is a competitive business mostly among nonprofit associations and government bodies, although there have been a number of substantial industry programs over the years.

Laboratory accreditation in the United States has a long history. It developed in many market sectors at different times and under different circumstances. As the assessments began to overlap and become duplicative, ways for consolidating the assessments have been explored. Since the mid-1970's two primary multi-purpose national systems resulted, but still new systems continue to develop.

This "history" article will cover three themes: efforts at coordination of laboratory accreditation; efforts to develop a national system; and development of international cooperation starting from 1970 to the present with brief speculation on the future. My main focus is on calibration laboratory accreditation. In the interest of brevity, there inevitably are several elements of the history left out.

Editor's Note: Unger worked on the NVLAP Program at NBS from 1978 to 1986.

At press time, we learned that Peter survived a heart attack on June 5. He is doing well after certain procedures and we wish him a speedy recovery.

The Seventies

Coordination Efforts. Efforts to coordinate accreditation began in earnest in 1970. Laboratories were being forced into assessment by more and more accreditation systems. Some claimed they are accredited or assessed by over 100 organizations per year. It is very difficult to design a management system in a laboratory that meets these different requirements, some of which may be conflicting. Small laboratories that are not subject to multiple accreditations because they work in only one state or market sector prefer this situation because it requires that the larger laboratories working in a number states or sectors to become accredited by each state or sector if the want to do business in that state or sector.

Thus larger laboratories typically demand coordination of accreditation activities. A significant group of laboratories takes the position that competition among laboratory accreditation systems will keep costs down and provide alternatives. The problem with this position is that, if a user is familiar with only one accreditation system and is a significant purchaser of testing services, a laboratory may be forced to be accredited by this particular system or the user will not accept it.

If there are several users like this, the laboratory can be forced into multiple accreditations. An effort to address coordination came at a "National Conference on Laboratory Accreditation" hosted by the National Bureau of Standards (NBS) on 22 September 1970. In his keynote address, Lawrence M. Kushner, NBS Deputy Director, noted emerging needs for the evaluation and accreditation of testing laboratories. "That current dialogue in the Congress and in the administration over the welfare of the U.S. consumer had focused attention on the voluntary standards system. There is a search for mechanisms to assure that the system can function more effectively on behalf of the total public interest . . . . In several pieces of legislation that have been introduced to the Congress, there are provisions for Government accreditation of laboratories that would perform tests on consumer products and certify them with respect to conformance to standards."

Dr. Kushner identified several organizations then currently involved, including the American National Standards Institute (ANSI), the American Society of Testing and Materials (ASTM), the American Council of Independent Laboratories (ACIL), the American Association of State Highway & Transportation Officials, the Department of Housing and Urban Development and the National Conference of States on Building Codes and Standards. He noted that in international trade, the agreements among nations to accept each other's test results identify the need to provide confidence (by means of accreditation) in the competence of laboratories used by the exporting country rather than having products retested in each importing country's laboratories. Dr. Kushner concluded by summing up the NBS role:

> "NBS should not set itself up as a laboratory evaluation agency. First, we don't have the necessary skills in all the areas involved. Second, injecting ourselves into an authoritarian posture such as would be involved is alien to the tradition

of the Bureau. Third, and most important, we have confidence that the private sector bodies, with appropriate participation by the Government, can get the job done."

No specific direction was suggested at the NBS conference, but concern for the situation was clearly demonstrated. Major independent and supplier laboratories kept pressing the need for coordination and several wanted the development of a comprehensive multidiscipline national system administered by Government. NBS was continually pressed to take the lead and explored various alternatives for creating a national accreditation system, but action languished until the Assistant Secretary of Commerce for Science and Technology, Betsy Ancker Johnson, decided to implement some form of program.

Development of a National System. The first announcement in the Federal Register in 1975, was for a system dominated by government. Numerous comments were received complaining about the predominant government role in the process and the approach was considerably modified to include private sector involvement in various advisory capacities. Product certification bodies and some industry sectors demanded that a laboratory accreditation program (LAP) should only be developed if a need for such a program in a particular product area could be demonstrated and then only for specific tests or types of tests.

The result was the National Voluntary Laboratory Accreditation Program (NVLAP) announced in February 1976. NVLAP required that, in order to accredit laboratories in a particular area, a "finding of need" had to be established through announcement and comment on a proposed program. The first two programs (or LAPs) were established for 36 tests of thermal insulation and 6 tests for freshly mixed concrete. Advisory committees were set up to recommend accreditation requirements.

All this effort afforded the independent and supplier laboratories little hope of accreditation for all testing areas in the near future. A group of 60 people met in January 1978, and concluded that the NVLAP program would not meet their needs. They agreed to establish a private sector system.

The American Association for Laboratory Accreditation (originally AALA, but changed to A2LA in 1987) was established in July 1978, providing accreditation in several disciplines for virtually all types of testing. A single criteria document (originally ISO Guide 25 and now ISO/IEC 17025:2005) based on the work of the International Laboratory Accreditation Conference was established. ILAC was originally a conference but now is a formal incorporated international "Cooperation." The system was designed to accredit each laboratory for the specific mix of tests it performed. A2LA was modeled after the successful Australian system, the National Association of Testing Authorities (NATA), the first national system of its kind established in 1946.

Development of International Cooperation. The first International Laboratory Accreditation Conference (ILAC) was held in Denmark in 1977. The second ILAC conference was held in Washington DC, at which agreement on a general accreditation requirements (the eventual ISO Guide 25) was reached. The focus of ILAC was to develop the concept of accreditation as a trade facilitation tool. If the global accreditation community were to accept the outcomes of each other's accreditations, it would need to operate with equivalent criteria and processes.

The Eighties

Coordination Efforts. The demand for coordination continued in the early eighties. NBS held another conference "Laboratory Accreditation: Future Directions in the United States" in November 1981. There was a push for NVLAP to merge under the auspices of A2LA. The major points proposed were:

- There should be a single national laboratory accreditation system that is both practical and efficient covering all disciplines of testing; and
- Laboratory accreditation is not inherently a governmental function, so it belongs in the private sector and will be conducted there much more effectively and efficiently.

This 1981 proposal was rejected by NBS, as there was no consensus to proceed in this fashion. Nonetheless, efforts to reduce duplication persisted. In March 1985, NBS published an "Accreditation Guideline Implementing Federal Standards Policy" which endorsed the use of an ASTM standard (equivalent to the ISO standard) for recognition of accreditation bodies. This policy encouraged federal agencies to rely on the private sector to supply Government needs in laboratory accreditation. There is little evidence that Federal agencies ever accepted or implemented this guidance.

In a 1986 paper, John Locke, President of A2LA, called for coordination of laboratory accreditation systems in the U.S. The problem was particularly acute in the environmental testing market as Congress had already passed the Safe Drinking Water Act granting primacy for laboratory accreditation to each of the 50 states. The result was that, while NVLAP and A2LA were still struggling to formulate a sensible unified national laboratory system, Pandora's box had been opened. The history of coordination efforts in the environmental area has resulted in a National Environmental Laboratory Accreditation Program (NELAP) basically dominated by state accreditation authorities. NVLAP and A2LA were excluded and continue to be excluded from NELAP.

Progress on the National System. Both national systems (NVLAP and A2LA) focused their attention on accreditation of testing laboratories. Initial efforts to start accreditation of calibration laboratories were initiated with formal findings of need for NVLAP accreditation of microwave and pressure calibration laboratories at the turn of the decade. Not withstanding the significant opposition to such programs from many members of the National Conference of Standards Laboratories (NCSL), NVLAP attempted to establish these two LAPs. However, the technical arm of NVLAP, NBS, proposed technical criteria for the assessment of these laboratories that were deemed unacceptable to the interested market of laboratories. Thus, both LAPs were never implemented.

A2LA informally encouraged NVLAP to develop a comprehensive calibration accreditation program, noting the need to work with NVLAP and the desire for NIST involvement in establishing an authenticated traceability system for measurements. These would underpin U.S. test results and the need for an accreditation system to confirm traceability to the international market. This idea continued to be resisted by NCSL.

Continued on page 37a

A YEAR IN THE LIFE OF NCSLI — A PHOTOESSAY

Who we are and what we do.

As I pointed out in my page 2 editorial message, I wanted this essay to reveal the wide variety of activities that NCSLI is all about. We are motivated to build a better measurement system in this world, better measurement assurance, less costly, more dissemination of successful techniques, more re-use of known processes, and more widely-implemented, with better coordination with world standards and accreditation bodies. Much of our progress is based on communication. Between nations, between members and manufacturers and each other, between NMIs and affiliated standards labs, accreditation and certification entities, between all of us who are active in our NCSLI work. Just review the roster of volunteer committees and read the reports of the NCSLI regions and committees, and you begin to understand how globally pervasive is our influence.

These photos are symbolic of one year of our life cycle. New officers in January, four Board meetings, dozens of committee meetings, maybe a hundred region and section meetings. Then the annual conference and its "meeting of the clan." Several dozen liaison organizations interacting. International travel of our NCSLI executives to meet with global standards and accreditation organizations. The photos themselves came from many different years.

MONTH-TO-MONTH ORGANIZATIONAL ACTIVITIES BOARD, COMMITTEES, REGIONS, LIAISONS

The backbone of the NCSLI organization is the region/section meetings. They give a friendly and welcoming local flavor to our member delegates, guests, hosts, speakers, and sometimes informal exhibitors. I am fascinated by the variety of product manufacturers who are members of our organization. Here Section Coordinator Roger Burton called a meeting to be hosted by the Harley Davidson Motor Company. Sorry, the "Harley motorcycle" shown was NOT a door prize.

With recent organizational attention on uncertainty theory and practice, some of our region/section speakers have had to endure a literal "road show." Here, at one section meeting, for 7 volunteer speakers, they ALL had "uncertainty" in their paper titles. Some came from quite a distance to contribute. (l - r) Warren Lewis, Tom Wiandt, Jeff Gust, Charlie Francis, Carol Hockert, Mike Searle and Dr. Jim Salsbury. Our willing speakers deserve our sincere thanks.

Communication with NCSLI headquarters at the Boulder Business Office has been greatly facilitated by installation of a comprehensive website for the use of our members. Committee progress, organizational volunteer contacts, and a wealth of up-to-date information is available instantly, a huge advantage over our early days of faxes and snail mail.

Passing the responsibility of NCSLI leadership from our outgoing President (Steve Stahley) to the incoming President (Dave Agy) is more than handing over the gavel. The Board now goes through a coronation ceremony, here in April, 2004.

NIST has been crucial to NCSLI since its founding in 1961, when NBS assumed our sponsorship. This year 2006 view of the NIST campus in Gaithersburg shows great expansion from 1966. New construction has been recently authorized by Congressional budget committees to keep NIST at the forefront of the world's technologies, from fire-research to semi-conductor test to dental technology. Our Board executives have an annual (Spring) meeting with the top management of NIST to discuss issues of common interest.

Central Georgia Technical College offers metrology training with hands-on experience for various disciplines of metrology. With the falling enrollments of metrology students, our industry has taken notice, and NCSLI's Education Committees are hard at work on solutions.

Our numerous committees meet year round, often taking advantage of a region gathering or for sure at the annual conference. Face to face meetings are crucial, although with our new Internet technologies, many committees can provide some functioning with teleconferences.

Belonging to the NCSLI Board of Directors is hard work; long and challenging. Yet, when your organization commits to supporting your time and travel, you do end up in some nice places. In this case, the Board met on the Pacific Ocean at Monterey, CA. They took a short break from the interminable meetings to gather by the ocean.

In October, 2001, Ramona Saar called her region 3 meeting for Patuxent River Naval Air Center, and as a result got to pose for their attendance photo beneath a Navy F-14 Tomcat, the star of the movie, "Top Gun."

For his May, 2004 region 1430 meeting, Keith Cable called the location for the Seattle Museum of Flight, natural enough since it is the home of Boeing Airplane Company. But Keith posed his attendees under the retired European Supersonic Transport from the United Kingdom.

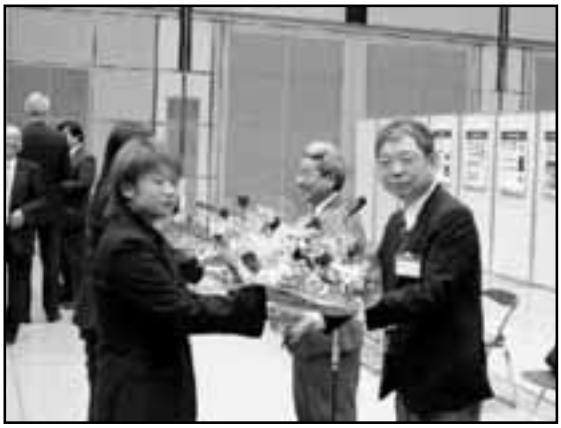
GLOBAL CONNECTIONS

With our increasing global reach in the standards arena, NCSLI has worked steadily with International organizations, such as the International Standards Organization, whose headquarters are shown here in Geneva, Switzerland. ISO's 17025 and NCSLI's 540Z interactions are just one example of these significant and crucial technical connections.

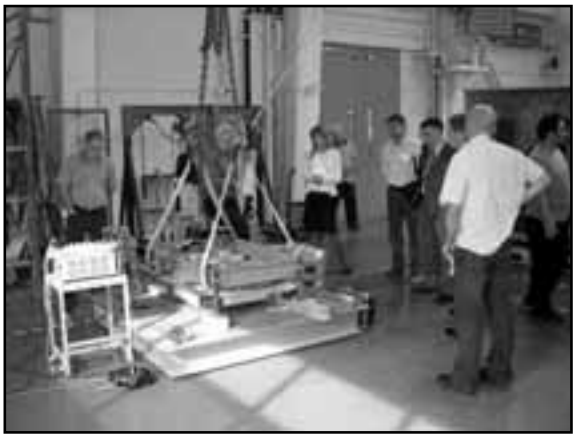
BIPM Director Andrew Wallard (c) welcomes several NCSLI visitors to his headquarters in Paris. Wallard was a recent Keynote Speaker at our Salt Lake City conference in 2004. He provides close international coordination for the activities of NCSLI.

In 2001, Dr. Hector Nava, Director General of CENAM, welcomes NCSLI visitors John Ragsdale (front center left) and Charlie Motzko to Mexico. He had his senior staff members of CENAM attend the briefings and the social evening.

The Japanese conference and forum, hosted jointly with NCSLI, annually amazes all of us with a national technical meeting, last year drawing 515 attendees. It boasts a large exhibitor floor, full technical paper schedule and the wonderful opportunity to network with a whole country full of technical experts.



I don't think most of our national cultures are as advanced in the niceties of protocol as this. Retiring co-chairman Kazumi Yokoi of Agilent (r) and Mr. Tsuchiya, who served as a chairman of NCSLI Japan succeeding Mr. Yokoi (in back), receive flowers as a recognition of their service. Yokoi was instrumental in starting NCSL Japan in 1992.



NCSLI conferences and local meetings usually offer technical tours of those local metrology facilities. For the Canada Conference in October, 2004, Measurement Canada hosted a tour of their operations, this being their High Capacity Mass facility.

In an interesting and useful lecture at the same Canada Conference, Lawyer Deidre Martin presents an overview of legal liability considerations for metrologists. Now there is a subject we metrologists don't often think about. One useful aspect of our regional reports are for our readers to learn about important current metrology topics.

In our entire 45-year history, there has never been a more peripatetic NCSLI traveler than International V.P Ed Nemeroff. His travel to Egypt led to NCSLI participation in local conferences. His suggestions also led to the NCSLI publishing a poster and document about the venerable measurement of the ancient CUBIT.

Another of Ed's treks led him to the Mongolian National Metrology and Standards Institute in the capital city of Ulaanbaatar. Mongolia became a sovereign nation in 1921 and their Center for Standardization was created in 1924.

Ed also found himself working in far outposts of standards on projects for the U.S. Agency for International Development. In this trip, he visited the Standards Agency for Afghanistan, housed in a fortified facility behind sandbags. Imagine that process for going to work every morning to measure volts.

Still another project took Ed to Central Asia to Kyrgyzstan, where he worked with local government organizations to set up a Central Asia Region for NCSLI. This meeting was hosted by the National Institute on Standards and Metrology (NISM). Attendees came from Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, and they included scientists with high responsibilities in their nations.

The NCSLI Board has made a practice of meeting at various cities for their 4 gatherings per year. By doing this, they visit important cities with future conference sites, or the homes of important region or section groups, such that they can visit the region meeting during their 3 days of meetings. Since our initiatives to internationalize, the Board has also met in Quebec in Canada and in this case Mexico City, as a guest of the CENAM organization, during one of their national conferences.

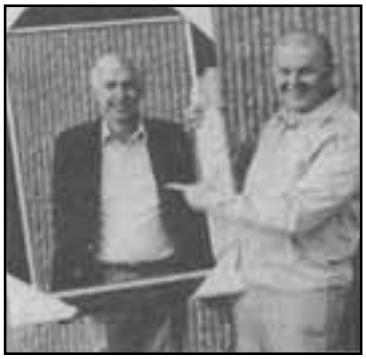
THE ANNUAL CONFERENCE

Imagine walking up to the convention center in Salt Lake City, and being greeted by 10 LARGE silver and black flags flying out front, with NCSLI's name and logo imprinted on them. Makes you feel the city is happy to see you visit.

NCSLI has invited a number of global standards leaders to present the keynote speeches for the annual conference; Canada's Arthur Carty for 2000, ISO's Graeme Drake for 2004 and BIPM Director Andrew Wallard, here, from the 2002 conference.

The conferences often serve to bring together the leaders of a number of Global National Measurement Institutes (NMIs). This group came from many nations. It is stunning to know that our organization has good relations with the thought leaders and managers of so many National Measurement Institutes.

One of the main events at each year's annual conference is the award of the William Wildhack Prize. We recognize one of our NCSLI contributors or an Industry figure who has had the most professional impact during the last decade. In 2005, Richard Pettit, retired of Sandia National Labs, was selected for his many years of general contributions as well as the difficult management job of technical papers chairman for the conference.



The personal friendships which go along with the professional side of NCSLI Board have always been a major characteristic of NCSLI activity. During one of the social times for this Board meeting in 1986, someone bought a new picture frame and cast Ralph Bertermann in the picture. Jim Ingram is holding the frame. It is likely that neither of these men realized in those earlier years of hard work on the Board that they both would later rise to the NCSLI Presidency.

A 1968 NCSL Annual Conference skit featured Bryan Werner (l) as the R&D scientist with Ralph Berra as the Metrology Lab Manager, trying to communicate with each other. Our metrology community has learned well over the years, how to communicate the value of metrology and measurement assurance to the government organizations who support our standards needs, and to our own industry's upper management teams.

At the 2005 annual conference, a luncheon entertainer crafted a skit involving a "measurement expert." As it happened, the 2005 Wildhack Award winner, Dr. Richard Pettit was enlisted for the skit, and given a hat captioned "Genius." The chronicles do not tell us whether he solved any proposed measurement problem.

Aside from the notoriety and self-satisfaction one gets from presenting a technical paper at the annual Workshop and Symposium, you also get a free breakfast. Here Technical Program Chairman Dick Pettit meets with the authors for the day to brief them on best lecture principles and his orders of the day.

At the 2005 conference, the International Dinner event was held aboard an evening cruise ship, offering friendly receptions for a large crowd. They motored along the Potomac, with grand views of the downtown Washington, DC from sun-down to dark. A wonderful opportunity to learn other cultures and friends.

Imagine cruising along the Potomac River in Washington, DC, as the sun goes down and offering these stunning views of the major Washington, DC national monuments and buildings that are arrayed along the journey. It is amazing how far the "International Dinner Event" has come from the first small gathering of maybe 20 people 20 years ago.

For the spouse program tours at the 2004 conference, they visited the home of the legendary Mormon Tabernacle Choir and this massive pipe organ. For these measurement experts, they might wish to measure the overpressure of the audio power of those ranks of pipes at full output.

Social activities at conferences vary according to the location. Barbeque in Colorado, Square Dancing in Salt Lake City. I recall one conference where there were Country and Western line-dancing lessons. Sometimes one does a double-take to see a staid, technical, metrologist by day exhibiting considerable dancing skills by night.

Those 4-5 days at the annual conference are a mad scramble of activity. Our multitudes of committees take advantage of the attendance of many of their members to gather and work on the committee projects while all are in town. With a roster of 62 committees, the technical and business reach of NCSLI is pretty impressive.

SHOWTIME! Often the booth setup chaos is a family affair as the exhibitor arrives a couple of days early to be sure all the cartons and cases got there. Speaking from experience of setting up dozens of exhibits, one is never relaxed until the opening bell the morning of the conference, when the rugs are down and the whole place looks wonderful.

The summer conferences are established so that our metrologist members can bring along their spouses and families to enjoy with them the cultures of the various cities in our nation. Tours and programs offer educational and cultural advantages to kids, such as the Smithsonian Institution and national government tours offered in Washington, DC.

Our loyal exhibitors who support the NCSLI annual conference deserve our hearty thanks because a major revenue factor in our annual budget is supplied by the exhibit income each year.

Our conference organizers have arranged the days and evenings to maximize the chance for metrologists and their spouses to network and enjoy meeting others with the same life work. This Fluke-sponsored reception is arranged to be near the exhibit floor, so crowds can wander and interact while finding new products for their work, if they wish.

The products and services presented at the conferences are truly amazing. Our technologies are the state of the art, which makes the career of metrology one of the most stimulating and challenging.

For several decades, Mike Suraci (left, behind the table) managed the ever-popular door prize event at the close of our annual conferences. Lately, Steve Doty, Navy Corona, and Monique Moi have stepped up to run the fun times offered to attendees who stay to the last afternoon. Prizes are plentiful and chances of winning are high.

As you walk around an annual conference, from the registration process to the huge banquet event, and the expansive exhibit floor, you have a suspicion that it didn't just happen. Here is the group of people who are behind the organization of the affair. And these are just the visible heroes. We also thank the hundred+ paper presenters and exhibit companies that support our organization.

When I saw this picture of Armstrong, the service dog of attendee Mark Ruefenacht, in the 2005 conference pictures, I asked for the rest of the story. Mark reported, "Armstrong is my service dog and has been specially trained to detect acetones that are emitted by a diabetic person in a hypoglycemic state. Armstrong is able to detect hypoglycemia at 60-70 mg/dL and alert the person. As a working service dog he accompanies me in my travels throughout the United States. There are a number of documented cases of pet dogs that have naturally alerted their owners to hypoglycemia. However, Armstrong is one of the few, if not the only dog in the United States that has been formally trained to perform this service." I say, "Amazing, and certainly a different kind of measurement sensor than we are used to."

A View from an NMI (Continued from page 8a)

Developments in the SI

We are on the brink of seeing the emergence of an electronic kilogram within the next five years, as well as ever more precise measurements of time - perhaps down to the femtosecond level. Researchers in nanotechnology foresee a need for mass measurements even at the zeptogram and yoctogram levels - precise enough to measure the mass of an individual hydrogen atom. The measurement uncertainty required of such measures seems to defy belief - and yet NMIs are likely to need to address such concerns in the future.

We expect to need new combinations of measurements for work across disciplines as the lines between physics, chemistry and biology blur. Using quantum dots to identify bacteria is only one possibility. Metrology for carbon nanotubes may well underpin the bio-nano materials and technologies of the future.

NIST is a member of the Comité international des poids et mesures (CIPM) and a signatory to its Mutual Recognition Arrangement (MRA). We take great pleasure in the Sistema Interamericano de Metrologia (SIM) acceptance of the NIST quality system for measurement services, first for calibrations and now for Standard References Materials (SRMs). However, we can't rest on our laurels; we, and all the NMIs of the world, must figure out how to weave together the measurement results from accredited laboratories, both in industry and at the sub-federal level.

Finally, NIST has already seen the emergence of requests for unusual Standard Reference Materials (SRMs), ranging from ephedra to nanotubes; such requests are likely to increase exponentially. Yet, industry still needs the early SRMs developed by NIST for metals such as iron and steel, and materials such as Portland cement. NIST, and its sister institutions, must continue to satisfy the needs of existing and emerging industries, recognizing and anticipating new and different measurement needs.

Having a reliable crystal ball is possible only when the NMIs and industry work closely together, as they do in NCSLI, to dream of new measurement capabilities needed to foster innovation!

THE VISION OF HARVEY LANCE

Harvey Lance, in retirement, in 1986

The true hero, with the founding vision for NCSLI, was Harvey Lance, of the Boulder Labs of NBS. It was his paper, presented in that well-reported measurement conference on June 22, 1960, which created the immediate popular support for taking some sort of action. This resulted, a year later, in the establishment of our measurements-oriented organization.

Excerpts from:

"THE NATION'S ELECTRONIC STANDARDS PROGRAM: WHERE DO WE STAND?"

by Harvey Lance

In this paper, recent progress in the nation's electronic standards program is noted. Some current problems which have arisen in connection with the program are discussed, and suggestions are made regarding the solution of these problems.

What Constitutes a Good Standards Laboratory?

In keeping with general government policy, NBS provides calibration services only for standards of the highest quality and provides only those services which the laboratories cannot reasonably be expected to provide for themselves or to secure elsewhere. It is implied, then, that only a limited number of laboratories ordinarily should receive services directly from NBS, that those laboratories should serve additional laboratories of a lower level, and so on, until all standardization needs are met. This is, in fact, the system now in use.

There is a considerable variation in the procedures and methods of operation of the top echelon laboratories. Some of the methods and practices which have been observed seem to be more widely applicable, and if adopted should result in improved accuracy of measurement.

There are several criteria for a good standards laboratory:

First, the importance of the laboratory must be recognized and supported by management, and it must have competent supervisory and operating staffs.

Second, the laboratory must have adequate facilities and equipment and must maintain the proper physical environment.

Third, to preserve accuracy of measurement, the laboratory's reference standards should be segregated from its working standards, shop standards, and test equipment and should be used only as reference standards.

Fourth, the laboratory's reference standards should be calibrated in terms of the national standards.

Fifth, the calibrations performed by the laboratory must be accurate, within the claimed limits of error.

In particular, there is a serious need for an association of standards laboratories. This association might be a new and distinct organization or it might be made a part of an existing professional or technical group. There are many needs which such an association could fulfill.

1. Traceability of Calibrations
2. Justification of Standards Requirements
3. Interim Standards and Calibration Services
4. Measurement Agreement
5. Self-Qualification of Standards Laboratories
6. Education and Training of Standards Personnel
7. Electronic Calibration Services of NBS

It was pointed out that the nation needs a broader recognition of the benefits of standardization; further improvements in the quality of top echelon standards laboratories and a greater supply of competent personnel; and a substantial increase in the calibration services available from NBS, together with the creation of the new standards on which these services must be based.

The latter need was emphasized in recent discussions with representatives of industry regarding measurement requirements existing now in a few specific fields. As a result of the discussion, it appears that if work at NBS in these fields were to continue at its present rate, and without concern for future needs, five or ten years would be necessary to meet current requirements. A further and startling result is this: preliminary estimates agree that even if greatly increased funding were available immediately, it would be possible only to cut in half the time required to meet current needs.

A prime concern of NBS must be to find ways of bettering these estimates, and, at the same time, to increase its efforts toward meeting future needs. NBS should concentrate on these basic tasks and should leave to others the responsibility for addition interesting and necessary work.

This is one of the reasons why an association of standards laboratories is urgently needed to assist in meeting the nation's standards needs. It is one reason why systems engineers must determine what standards needs are really urgent, and must explain why they are urgent. It is a reason why everyone must work together to establish, at the earliest possible date, an electronics standards program which will close the wide gap between capabilities and requirements, and which will anticipate and meet the needs of the future.

NBS ACCEPTS NCSLI SPONSORSHIP

L.B.W.
12/7(61)

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

ADDRESS REPLY TO
NATIONAL BUREAU OF STANDARDS
WASHINGTON 25, D. C.

December 4, 1961

IN YOUR REPLY
REFER TO FILE NO.
30.00

Mr. Lloyd B. Wilson, Chairman
Gen'l Committee, National Conference
of Standards Laboratories
c/o Sperry Gyroscope Company
Mail Station 1-37
Great Neck, L.I., N. Y.

Dear Mr. Wilson:

With reference to your letter of November 8, 1961, the National Bureau of Standards will be pleased to act as a sponsor for the National Conference of Standards Laboratories. Mr. William A. Wildhack will serve as the official liaison representative between NBS and the Conference.

The National Bureau of Standards is pleased to cooperate in this effort of standards laboratories throughout the country to further the development and application of standards for physical measurement.

Sincerely yours,

A. V. Astin
Director

In 1961, NBS Director, Allen Astin, authorized his Boulder Lab to assume sponsorship of our fledgling metrology organization of just under 100 member companies.

45 YEARS OF NCSLI HISTORY

The way we were

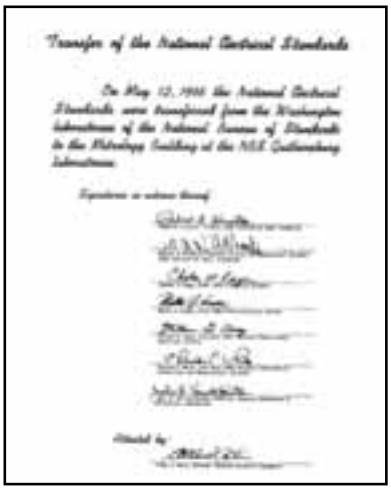
Executive Ad Hoc Committee attendees of the First NCSL Conference--August 1962. (L-R) Charles Johnson, Lloyd Wilson, Harvey Lance, Charles White and William Wildhack.

The location of NBS at the founding year of NCSLI was on Connecticut Avenue, in downtown Washington, DC, in really-old, typical "government" buildings. It was rapidly outgrowing its space.

A committee meeting from the early 1960's. Ivan Easton, General Radio, Lloyd Wilson, Sperry, William Wildhack, NBS, Charles Johnson, Boeing.

A meet-the-experts panel at a Conference forum in the mid-60's.

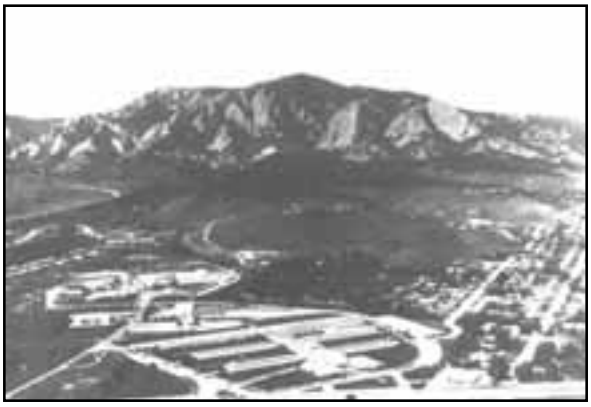
These two photos show the move, and the certificate documents the transfer of key national standards from downtown Washington, DC, to the brand new NBS campus at Gaithersburg on May 12, 1966. Presumably the scientists didn't want "professional" movers to handle their precious hardware, such as these saturated standards cells. But would you want your standards in the hands of these well-meaning amateurs? (IN SUITS!) The certificate shows that three NCSLI executives witnessed and certified the transfer; Bill Amey, Charlie White and John Van de Houten.


Transfer of the National Central Standards

This overview, shot in 1966, of NBS's magnificent new campus at Gaithersburg, MD, has served as home for NBS/NIST since their move from downtown. It was designed to house superior facilities for industry conferences across the many constituent groups that NIST serves.

A typical BOD meeting, July 1971. Seated (L-R): Bill Vandel, Jim Hadley, Dave Mitchell, Steve Kozich, Jerry Hayes, Marty Vyenielo, Mort Angelo, Wes McPhee and Ralph Barra. Standing: Carl Boyer, Don Greb, Don Hervig, Harvey Lance and Frank Dyce.

The June 1968 Newsletter reported the promotion of Dr. Ernest Ambler to Director of the Institute for Basic Standards of NBS. He would later assume the overall direction of NBS during their important growth years of NCSLI in the 1970's. Dr. Allen Astin had been NBS Director when NCSLI was created, and agreed to our sponsorship.



This aerial shot of NBS, Boulder shows a grand vista of NBS's high tech facility at the base of the Rocky Mountains. We used to truly enjoy those NCSLI technical conferences scheduled at the NBS facilities, the mountain air and those crisp mornings. The social events often included a Western theme, barbecue cookouts and square dancing lessons. When NBS agreed to sponsor our fledgling organization, the NCSLI Secretariat was established in NBS, Boulder, with Ken Armstrong as our administrator, when he wasn't working his real job as Press Officer at the Labs.

After his service as the first NCSLI Newsletter Editor, Charlie White left AVCO, and his metrology career to become Executive Editor of Telecommunications Magazine, a well-respected industry publication. He held that post for decades. Charlie passed away in 2004 at 93

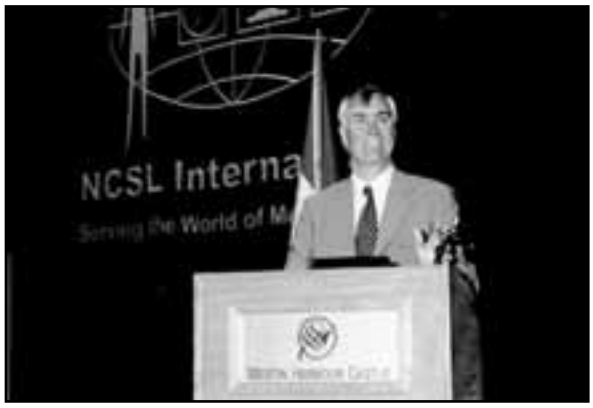
Along with general promotional efforts to publicize the importance of metrology to the nation, NCSL began effective informational testimony to U.S. Congressional Science Committees in 1983. Here, George Rice is shown at Capitol Hill before his testimony later that day. NCSLI officers also developed important technical contacts with those key committee staffs as well.

In 1986, after the National Bureau of Standards decided that it should no longer serve as a Sponsor for NCSL, our organization struck out on its own. The NBS Secretariat was moved from NBS, Boulder, to this office complex across town in Boulder. Ken Armstrong retired from NBS to become our first Business Manager, later succeeded by Wilbur Anson.

For years, the largest regional operation was Region 8 for the greater Los Angeles area, managed by Rolf Schumacher of Rockwell. In this meeting on the Queen Mary ship in Long Beach, Rolf invited Member Organization's Appointing Officers to attend, along with their Member Delegates, as a method of promoting the value of NCSL membership. Today's leading regions for meeting attendance probably is shared between the Twin Cities Section of Region 11 or the Japan or Canada regional meetings.

This hotel fire during a Board meeting in Ottawa, Canada was one of three fires, which interrupted the safety of our people during several decades. Other fires occured in Gaithersburg, during an Annual Conference, and in Montreal, Canada during another Board meeting. Luckily, none of our members was ever hurt.

Management of NCSLI Annual Conferences started with local volunteers, and did not include the technical exhibits, making it only half a back-breaker. The addition of exhibits did wonders for the NCSLI treasury, but also required a professional "volunteer," Dean Brungart, to manage those highly successful exhibitions. Later, Business Manager Wilbur Anson, shown here with his computer, took over all registration and proceedings activities, a major management overload once a year.



Finally, in the year 2000, NCSLI organized our first Annual Conference and Workshop outside the USA. A very successful conference was held in Toronto, Canada. Dr. Arthur Carty, President of Canada's National Research Council delivered the Keynote Address.

Our very first NCSL International Luncheon at the 1979 Annual Conference. This period was the beginning of stronger Member Organization recruitment outside the U.S. Today the International dinner draws several hundred guests.

In October of 2003, the NCSLI Business Office moved about a mile, to a larger facility, 2995 Wilderness Place. This provided accommodations for a training center, as well as less expensive facilities.

Joan Wilshire again does the honors in cutting the ribbon for the new office on Wilderness Place, with Larry Johnson, Doris Schaffner, Dave Agy and Manager Craig Gulka looking on.

****

Editor's Message (continued from page 2)

The Global Impact of NCSLI

Some of us older folks don't particularly welcome birthdays. But the 45th birthday for NCSLI is a welcome event indeed. It seems pretty certain that those first 100 or so organizations who signed on to the founding of our venture in 1961 had NO concept of where it would take us.

And looking back from our vantage point today, we must find considerable pride in the accomplishments our founders and the achievements that the long line of industrial volunteers have wrought. Historically we were founded because of the rather poor condition of the U.S. metrology infrastructure in 1960, which was revealed to the Boulder conference in that year. That led to the forum of the whole attendance at the conference to call for "some kind" of organization that could work to improve measurements and national (global) measurement assurance.

40th anniversary issue of July 2001 has NCSLI history stories.

For the NCSLI 40th anniversary issue in 2001, I collected several articles in which I tried to capture those conditions of metrology in the later 1950's and entering the 1960's. Jerry Hayes (U.S. Navy) and John Van de Houten (U.S. Navy) helped paint the conditions of what wasn't a very pretty picture. What existed were serious and endemic reports that measurements done in one place, perhaps a manufacturing plant couldn't be repeated at other places in the nation, with the required consistency. Needless to say, a missile system or the moon-shot programs couldn't long survive when there was no reliable way to trust your measurements. And there was no serious national measurement assurance or even the traceabilities we know and expect today.

So all those early years of our industry and government and global cooperation and committee work got the measurement assurance into rather good shape. NCSLI kept growing from 100 to more than 1400 in the 1990's. It became a global force, bringing aboard not just member delegates from companies around the world, but we also integrated most of the key National Measurement Institutes (NMIs) of the globally-important national laboratories into our activities.

To me, it is amazing to walk through the corridors of our metrology organization and see all the thought leaders of the world involved. It is fair to say that our once-fledgling group of the 1960's, which had to learn to organize, promote, market ourselves, gain political force, and work for a vision of international cooperation in measurements, has done pretty well. For a bunch of engineers, who probably were far more comfortable in their calibration lab, we had to learn most of the organizational traits that our business bosses learned in college. And I claim we learned pretty well, indeed.

For this commemorative edition, I have again collected some invited articles with a vision of where we are headed in the next 10 years. Certainly technology is leading the way, but in today's world, commerce and industry are SO global that our organization and its global reach are more important than ever. A manufacturing plant in a U.S. city has impact IN and IS impacted by activities in countries of the Far East. Global standards operations in Europe are disseminated to the world. Global accreditation organizations bring efficiency to cross-national borders.

John Minck
NCSLI Newsletter Editor

IN APPRECIATION OF WILLIAM WILDHACK

William Wildhack
1908 — 1985

William A. Wildhack was born in Breckenridge, Colorado, on September 24, 1908. He earned the B.S. in E.E. and the M.S. in Physics from the University of Colorado.

With NBS since 1935, Bill was first engaged in research and development in the Aeronautical Instrument Section headed by Dr. Brombacher. In 1948, he became Chief of the Missile Instrumentation Section, and later helped Dr. Huntoon to narrow somewhat the missile reliability gap of that era. Tutored by Dr. McPherson, Bill recorded many a meeting for the NBS Committee on Testing before he was appointed as Chief of the Office of Basic Instrumentation. In 1961, he became NBS Associate Director for Measurement Services, which brought him wide contacts with NBS customers in the Army, Navy, Air Force, NASA and the Defense Communication Agency.

When the NBS Institutes were established in 1964, Bill was named Associate Director of the Institute for Basic Standards. In that capacity he was responsible for coordinating the Institute's calibration and measurement services to science, industry and other government agencies concerned with basic physical quantities. Before the advent of the Measurement Assurance Program, the torrid word was "traceability." That is noted in the definitive article on Instrumentation which he wrote for the McGraw-Hill Technical Encyclopedia.

Back in 1961, when Harvey Lance opined that the industrial standards laboratories of the country ought to have an association, it was the three W's—Wilson of Sperry Gyro, Woodington of General Dynamics, and Wildhack of NBS---who became the prime movers. It was Wildhack who chaired the organization committee, developed the bylaws and the committee structure, and secured NBS Director Dr. Astin as godfather to the lusty infant, which has grown into the National Conference of Standards Laboratories of today.

Excerpts from H.L. Mason, July 25, 1985, an NBS colleague of Wildhack

The William Wildhack Award

This silver medallion and a modest honorarium are presented to the annual winner of the Wildhack Award, for meritorious service to metrology.

The William A. Wildhack Award was established in 1970 in recognition of William A. Wildhack who was very instrumental in the founding of NCSLI, and who served as the Sponsor's Delegate from 1961 to 1967. Through his wisdom, leadership, dedication and foresight, he helped shape the organization during its early formative years.

The Wildhack Award is the highest honor of NCSLI and is given annually (since 1970) to an individual or group for an outstanding contribution to the field of metrology and measurement science, and which is in consonance with the goals and purposes of NCSLI. The award carries an honorarium of $1,500 plus a bronze and silver medallion bearing the likeness of Wildhack.

1970	Jerry Glassman	Navy Metrology Engineering Ctr
1972	Dr. Robert Kamper	NBS, Boulder
1974	Jack A. Hall	Rockwell International
1976	Dr. Ernest Ambler	NBS
1977	Doug Strain	ESI, Inc.
1978	Frank McGinnis	Sperry Corp.
1979	Jerry Hayes	Navy Metrology Engineering Ctr
1980	J. David Mitchell	Rockwell International
1981	Forrest Harris	NBS
1982	Dr. Churchill Eisenhart	NBS
1983	John M. Fluke	Fluke Corp.
1984	Dr. Andrew Dunn	National Research Council
1985	Dr. Bruno Weinschel	Weinschel Engineering Co.
1986	Dean Brungart	Teledyne Systems Co.
1987	John L. Minck	Hewlett-Packard Co.
1988	David Braudaway	Sandia Corp.
1989	Peter M. Clifford	London City University
1990	David Packard	Hewlett-Packard Co.
1991	Ed Nemeroff	Datron/Wavetek Inc.
1992	Dr. Joe Simmons	NIST
1993	Graham Cameron	Canadian Dept of National Defense
1994	Henry Sostman	Thermometry Consultant
1995	J. Michael Suraci	Lockheed-Martin Co.
1996	Gary Davidson	Strand, Davidson and Stata
1997	Robert Weber	Lockheed-Martin Co.
1998	Dr. Klaus Jaeger	Lockheed-Martin Co.
1999	Dr. Norm Belecki	NIST
2000	Ernest Garner	NIST
2001	Dr. Clark Hamilton	NIST
2002	Dr. Howard Castrup	Integrated Sciences Group
2003	Peter Unger	A2LA
2004	Tony Anderson	GCS Company
2005	Dr. Richard Pettit	Sandia National Laboratories, retired

NCSLI MILESTONES

2001

- NCSL International celebrated its 40th Anniversary.
- Dr. Andrew Wallard appointed as BIPM Representative to the Board of Directors.
- Dr. Clark Hamilton was named recipient of the 2001 Wildhack Award.
- Continuing Education Units (CEU's) were awarded to conference and tutorial attendees for the first time in NCSLI's history.
- Members of the Executive Committee met with the Directors and senior staff at the Institute for National Measurement Standards (INMS, Canada) and Centro Nacional de Metrologia (CENAM, Mexico).
- Published a Position Paper on "Laboratory Accreditation, Registration, and Certification" and on "Appropriate Use of the NCSL International Logo and Name".
- Published a Position Paper on the "Use of the SI System of Units".
- NCSLI presented a commemorative plaque to Dr. Karen Brown, acting Director of NIST, recognizing NIST's century of technical and scientific accomplishments.
- NCSLI signed reciprocal agreements with the Measurement Science Conference and the Conference on Precision Electromagnetic Measurement to provide complimentary booth space at each organization respective conferences.
- NCSLI signed a Mutual Recognition Agreement with the Brazilian Society for Metrology.
- NCSLI was restructured to align its Regions and Sections with Regional Metrology Organizations throughout the world and to maximize the efficiency of the Operations Vice President's.
- Accreditation and Measurement Uncertainty workshops were held in conjunction with Region/Section meetings at numerous locations throughout the United States during the year.
- An Education initiative was developed to focus on solving the ongoing education requirements of NCSLI's member organizations.
- Completed and signed the Constitution for the Joe B. Simmons Memorial Scholarship.
- 40th Anniversary Newsletter Supplement published.
- 40th Anniversary Video Tape prepared and distributed at Annual Conference

2002

- Dr. Howard Castrup was named recipient of the 2002 Wildhack Award.
- Accreditation and Measurement Uncertainty workshops were held in conjunction with Region/Section meetings at numerous locations throughout the United States during the year.
- Tony Anderson appointed as Director ILAC/NACLA to the Board of Directors.
- Annual Conference held for the first time in San Diego, CA. Attendance was 1,132 from 34 countries. Keynote address by Dr. Andrew Wallard, Director BIPM. Held 12 Tutorials.
- Dr. Seton Bennett appointed as EUROMET Representative to the Board of Directors.
- Joined EUROMET as a corresponding organization.
- Z540-1-1994 was reaffirmed as Z540.1-1994 (R2002).
- Z540-2-1997 was reaffirmed as Z540.2-1997 (R2002).
- Brought on board a web programmer, milestones that where achieved: on-line document & membership ordering system, Directory of Standards Laboratories on-line, membership driven "Training Information Directory", training aid library on-line checkout, region/section coordinators support site.
- Implemented new membership database management system using SQL.
- Collaborated with ASQ to develop the Certified Calibration Technician body of knowledge.

2003

- Peter Unger was named recipient of the 2003 Wildhack Award.
- Annual Conference held for the first time in Tampa, FL. Attendance was 1,069 from 32 countries. Keynote address by Dr. Arden Bement, Director, NIST. Held 14 Tutorials.
- 1st Board of Directors meeting in Mexico at Quantereo hosted by CENAM
- Moved office to new location on Wilderness Place
- Next President, Dave Agy, presents NCSLI Story in Japan
- Signed an agreement with AIAG
- Initiated a new Individual Professional Membership, Student and Educational Inst. Categories

2004

- Tony Anderson was named recipient of the 2004 Wildhack Award.
- Annual Conference held for the first time in Salt Lake City, UT. Attendance was 1,046 from 24 countries. Keynote address by Mr. Graeme Drake, Head of Conformity Assessment ISO Central Secretariat.
- 2nd Board of Directors meeting in Ottawa, Canada
- Grand Opening and Board meeting at the new office in April 18-21
- The new NCSLI Training Facility hosted four member organizations training programs:
  Fluke Corporation - one, five day session
  High Current Technologies - one, three day session
  Integrated Science Group - two, four day sessions
  NIST Time & Frequency - one, four day session
- President, Dave Agy, presents NCSLI in Japan during their October Conference
- Published; RP-10 - Establishment & Operation of Electrical Utility Metrology Laboratory (1/04)
- Published COmpanion Volume to Guide to Achieving Laboratory Accreditation (4/04)
- Published COMPARISON between ANSI/NCSL Z540, 1-1994 (R2002) and ANSI/ISO/IEC 17025:2000 (10/04)
- Developed and released the “New Publications Download” site for members to get the latest publication as they’re released.
- Signed an agreement with EUROLAB

2005

- Dr. Richard Pettit was named recipient of the 2005 Wildhack Award
- Annual Conference held in Washington, DC. Attendance was 1,042 from 21 countries. Keynote address by Dr. Hratch G. Semerjian, Acting Director of NIST. Held 19 Tutorials.
- Published RP-9, RP14 and RP-15
- Published the Comparison between 17025:2000 and 17025:2005
- The 174 Writing Group adopted ISO/IEC 17025:2005
- Implemented a Digital Rights Management (DRM) system to control all of the NCSLI publications

A GALLERY OF NCSLI PRESIDENTS

1960-61
H. Curtis Biggs
Sandia Corp.

1961-62
Lloyd B. Wilson
Sperry Gyroscope Co.

1962-63
Charles E. Johnson
The Boeing Company

1963-64, 64-65
Andrew J. Woodington
General Dynamics

1965-66
John R. Van de Houten
Aerojet General Corp.

1966-67, 67-68
Charles E. White
AVCO Corp.

1968-69
Harvey W. Lance
NBS

1969-70, 70-71
Jerry L. Hayes
Navy Metrology Engineering

1971-72
Frank J. Dyce
Martin Marietta Corp.

1972-73
Ralph J. Barra
Westinghouse Electric

1973-74
Donald J. Greb
Lockheed Missiles & Space Co.

1974-75
J. Dave Mitchell
Rockwell International

1975-76
J. Michael Suraci
Lockheed Corp.

1976-77
John L. Minck
Hewlett-Packard Co

1977-78
Laurel Auxier
Beckman Instruments

1978-79
Ron Kidd
Microwave Associates

1979-80
James A. Valentino
Sanders Associates

1980-81
John Lee
U.S. Instrument Rentals

1982
Dean A. Brungart
Teledyne Systems

1983
Hartwell Keith
TRW

1984
George Rice
Rockwell International

1985
R.B. (Pete) England
General Dynamics Corp.

1986
H. Bryan Werner
Westinghouse Specialty

1986-87
Ed Nemeroff
Datron, Inc.

1988
Gary Davidson
TRW

1989
Del Caldwell
Navy Metrology
Engineering Center

1990
William Simmons
Sverdrup Technology Inc.

1991
Graham Cameron
Canadian Dept. of
Defence

1992
Robert Smith
Loral Aeronutronic

1993
James Ingram
Guildline Instruments

1994
Ralph Bertermann
Abbott Laboratories

1995
William F. Doyle
AT&T Capital Corp.

1996
Anthony Anderson
Guildline Instruments

1997
Kevin Ruhl
TRW Corp.

1998
William Quigley
Hughes Aircraft Company

1999
Dr. Klaus Jaeger
Lockheed-Martin Corp

2000
David Abell
Agilent Technologies Inc.

2001
John B. Ragsdale
Tennessee Valley Authority

2002
Charles Motzko
C.A. Motzko & Associates

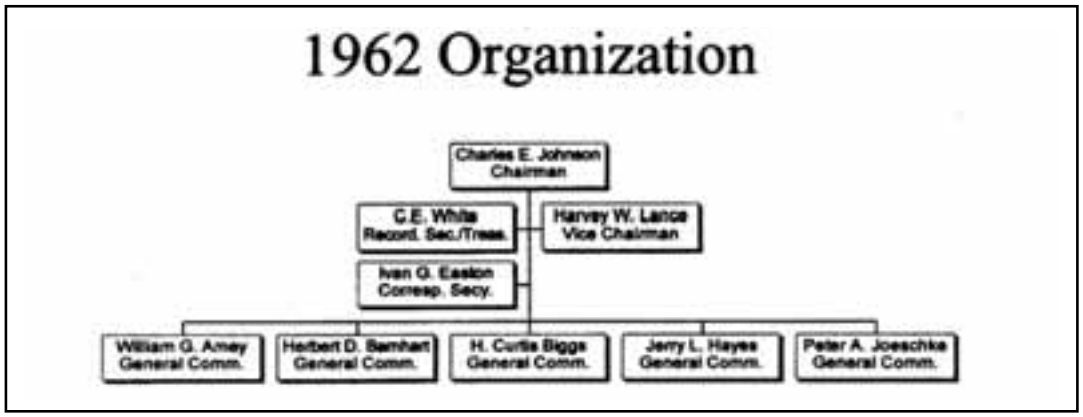
2003
Steve Stahley
Cummins, Inc

2004
Dave Agy
Fluke Corp.

2005
Harry Moody
Harry Moody Enterprises

2006
Jeff Gust
Quametec Corporation

THE 1962 NCSLI ORGANIZATIONAL CHART



Early Organization Efforts

By 1964, when the first "Directory of Standards Laboratories in the United States" was published, NCSLI had organized itself into working committees which met the needs of the time. The following committees were listed:

Standards Laboratory Work Load Control
Standards Laboratory Organization & Operation-Production
Standards Laboratory Organization & Operation-Commercial
Standards Laboratory Organization & Operation-R&D
Standards Laboratory Organization & Operation-Corporate Labs
Reliability of Measurements Standards & Instruments-Electronic
Reliability of Measurements Standards & Instruments-Electrical
Reliability of Measurements Standards & Instruments-Dimensional
Reliability of Measurements Standards & Instruments-Physical
Calibration Procedures, Specifications and Techniques
Evaluation, Selection and Training of Standards Lab Personnel
Recommended Practices for Standards Laboratories
Measurement Agreement & Calibration Traceability Organization
Measurement Standards Information Center

Regional Organization

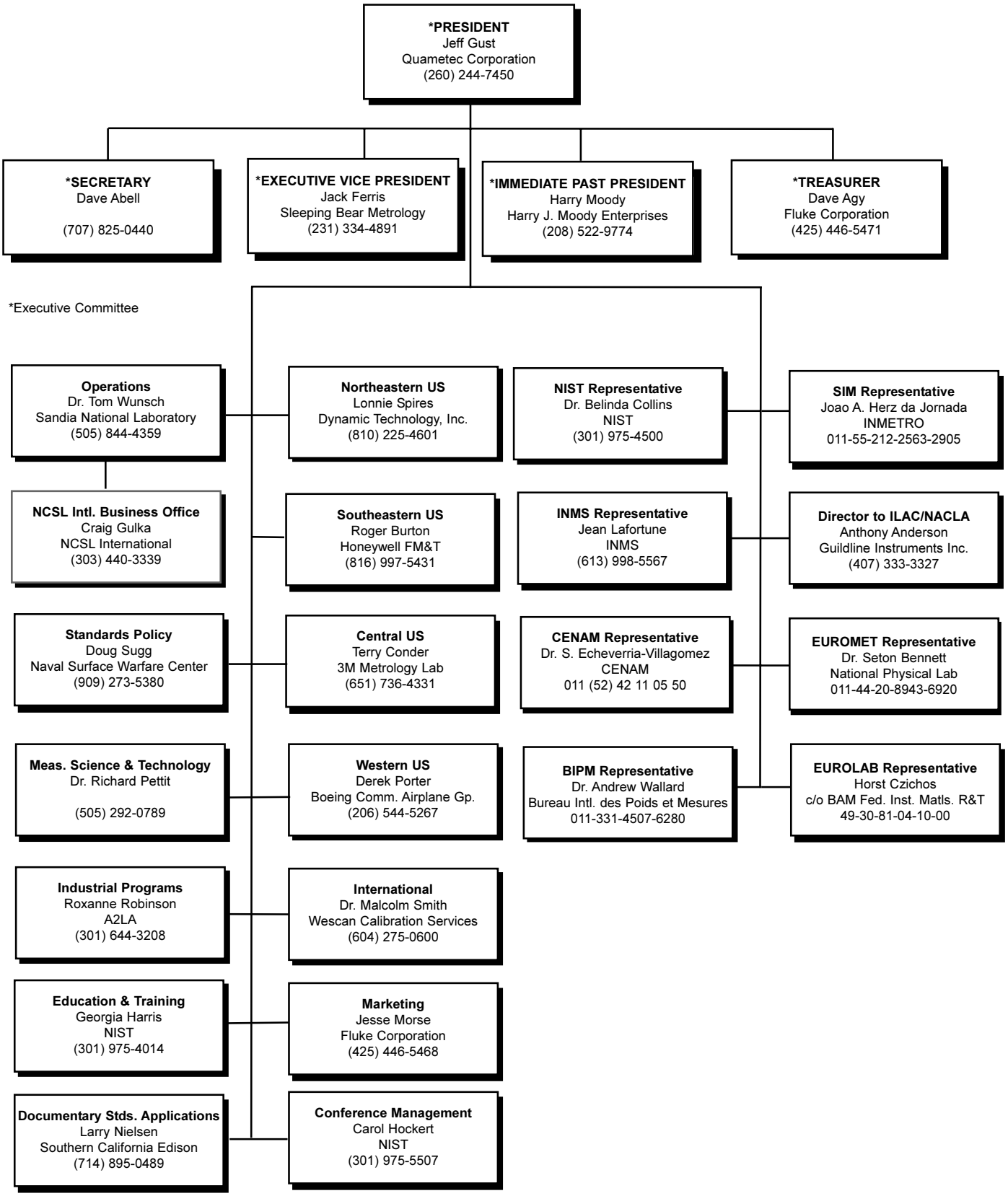
The first years' activities were accomplished without a formal regional structure.

For Contrast

The 2006 Worldwide activities of the NCSLI now include:

Volunteer Roster	146
Standing Committees	62
Regions and Sections	74
Liaison Delegates	23

THE 2006 NCSLI ORGANIZATIONAL CHART



AN HONOR ROLL OF CONTRIBUTORS

LEST WE FORGET

AN HONOR ROLE OF NCSLI CONTRIBUTORS

Forty-five years of NCSLI accomplishments happened because willing industrial volunteers put their time and energy into NCSLI. Over the years, some of those friends and associates have passed away. We feel that this anniversary retrospective should recognize the names of those who were friends and associates and contributors.

It should be noted that most of the original Founding Fathers, whose names are listed opposite, have passed on as well.

Editor's Note: The list has no particular order of service or of date of death.

Dr. Allen Astin
Jacquelyn A. Wise
Dr. Forest K. Harris
Max J. Unis
Bill Brenant
Algie Lance
Joe Cameron
Selden W. McKnight
Dr. Andrew Dunn
Dave O'Brien
John M. Fluke
Mario Maury
Jack Sutcliffe
Curtis Biggs
Joseph F. Keithley
Woodward G. Eicke, Jr.
Henry Sostman
Donald Greb
Hank Gonzales
Bill Quigley
Anthony Ulrich
Laurie Baker
Claude Miks
Lawrence Eicher
J. David Mitchell
Hank Daneman
Dr. Joseph Simmons
Dr. Churchill Eisenhart
Jim Valentino
Lloyd B. Wilson
Chuck Gardner
Herb Barclay
William A. Wildhack
Peter M. Clifford
Andy J. Woodington
Malcolm Shelton
David Packard
Dr. Peter Lacy
Donald Martin
William Hewlett
Ken Armstrong
James A.Harmon
Bascom Birmingham
Norbert L. Kusters
Charlie White
Phil Stein
Kent Crow
Barry Bell
Doug Severance
Jim Cross
Tom Tromanhauser

THE BIRTH OF NCSLI

The first reference to the formation of a standards laboratory organization was made by Harvey Lance, of NBS, Boulder, CO, on June 22, 1960, at the Conference on Standards and Electronic Measurements held at Boulder, June 22-24, 1960. In his paper titled, "The Nation's Electronic Standards Program: Where Do We Now Stand?" Harvey posed six problems concerning standards laboratories operations and concluded by suggesting the need for some sort of association of standards laboratories to help solve these problems.

In the discussion which followed, several people requested a meeting to consider Harvey's suggestion. This meeting was held at 8:00 am in the Boulder Laboratories Auditorium the next day, with Harvey Lance presiding and Wilbur F. Snyder of NBS, Boulder as Secretary Pro Tem. Attendence was 132 (the attendence list still exists) and the meeting concluded with the motion by Bill Wildhack, also of NBS, "that the General Conference Committee appoint a steering committee to investigate the possible organization, scope, and objectives appropriate for an organization of standards laboratories." The motion was unanimously approved.

The General Arrangements Committee, Ivan Easton of General Radio was Chairman, met at noon on June 24, 1960 and appointed an Ad Hoc Committee with Curt Biggs as Chairman, Harvey Lance as Executive Secretary, and Messrs. Amey, Geist, Wildhack, and Wilson as the other members. The Arrangements Committee also directed that the nucleus of six should increase the Ad Hoc Committee membership to twelve (later increased to 20). The Ad Hoc Committee membership was as follows:

H.C. Biggs, Chair	Sandia Corporation	Albuquerque, NM.
Harvey W. Lance,	NBS Exec. Secretary	Boulder, CO.
W.G. Amey,	Leeds & Northrup	North Wales, PA.
W.K. Geist,	W.K. Geist Co.	Los Angeles, CA.
William A. Wildhack,	NBS	Washington, DC.
Lloyd B. Wilson,	Sperry Gyroscope,	Great Neck, NY.
Ivan Easton,	General Radio Co.,	West Concord, MA.
W.R. Holmes,	Convair,	San Diego, CA.
O.L. Linebrink,	Battelle Memorial Institute	Columbus, OH.
J. Marks,	Office of Secretary of Defense	Washington, DC.
M.A. Mason,	George Washington University	Washington, DC.
J.W. McNair,	American Standards Association	New York, NY.
R.S. Chernoff,	Bell Aerosystems Co.	Buffalo, NY.
Jerry L. Hayes,	Bureau of Naval Weapons,	Pomona, CA.
R. C. Hill,	Hughes Aircraft Co.	Culver City, CA.
Charles Johnson,	The Boeing Company,	Seattle, WA.
Col. R. Stolle,	USAF, Air Material Cmd	Dayton, OH.
A.F. Welch,	General Motors Tech Center	Warren, MI.
Charlie E. White	AVCO R&D	Wilmington, MA.

The Ad Hoc Committee held four meetings as follows:

Sept 27, 1960	New York
Feb 13-14, 1961	Albuquerque
May 23, 1961	Boulder
Sept 15, 1961	Los Angeles

FOUNDING MEMBER ORGANIZATIONS

Founding Member Organizations of NCSLI are a bit hard to identify after all these years. The following organizations were listed in the first "Directory of Standards Laboratories in the United States," 1964 Edition, or were companies with member delegates listed as committee chairmen, or they were listed as paying members in the 1965 edition of the directory. And, since the Founding Members supported our fledgling NCSLI with annual dues and with a commitment of their "Industrial Volunteer" Member Delegate's time and travel expense, it is proper to recognize them here.

A & M Instrument, Inc.,	Long Island, NY.
Aerojet-General Corp,	Sacramento, CA.
Wm. Ainsworth & Sons, Inc.,	Denver, CO.
Airesearch Mfg. Co.,	Phoenix, AZ.
Allegany Ballistics Laboratories,	Cumberland, MD.
Allied Amphenol Products,	Sidney, NY.
Allied Bendix Aerospace,	Kansas City, MO.
American Instrument Co.,	Silver Spring, MD.
Automation Industries, Vitro Labs,	Silver Springs, MD.
AVCO/Textron,	Wilmington, MA.
Battelle Memorial Institute,	Columbus, OH.
Bausch & Lomb, Inc.,	Rochester, NY.
The Bendix Corp.,	Sidney, NY.
James G. Biddle Co.,	Plymouth Meeting, PA.
Boeing Aerospace Co.	Seattle, WA.
Brush Instruments Co.,	Cleveland, OH.
Bunker Ramo Corp.,	Canoga Park, CA.
Charles Stark Draper Labs,	Cambridge, MA.
Collins Radio Co.,	Cedar Rapids, IA.
Daystrom, Inc.,	Newark, NJ.
Douglas Aircraft Co.,	Santa Monica, CA.
EG&G, Inc.,	Las Vegas, NV.
Electro-Scientific Industries Inc.,	Portland, OR.
Endevco,	San Juan Capistrano, CA.
The Eppley Laboratory, Inc.,	Newport, RI.
Federal Electric Corp.,	Paramus, NJ.
John Fluke Mfg. Co.,	Seattle, WA.
Garrett Turbine Engine Co.,	Phoenix, AZ.
General Dynamics Corp.,	San Diego, CA.
General Electric Co.,	Richland WA.
General Electric Co.,	Oklahoma City, OK.
General Electric Co.,	Palo Alto, CA.
General Electric Co.,	Schenectady, NY.
General Electric Co.,	Pittsfield, MA.
General Electric Co.,	West Lynn, MA.
General Precision Aerospace,	Little Falls, NJ.
General Precision, Inc.,	Van Nuys, CA.
GenRad,	Concord, MA.
Grumman Aerospace Corp.,	Bethpage, NY.
Hercules, Inc.,	Magna, UT.
Hewlett-Packard Co.,	Palo Alto, CA.
Holt Instrument Laboratories,	Oconto, WI.
Honeywell, Inc.,	Philadelphia, PA.
Hughes Aircraft Co.,	El Segundo, CA.
IBM,	Kingston, NY.
Inland Testing Laboratories,	Morton Grove, IL.
Julie Research Laboratories, Inc.,	New York, NY.
Lawrence Livermore Nat'l Lab.,	Livermore, CA.
Lear Siegler, Inc.,	Grand Rapids, MI.
Lear Siegler, Inc.	Grand Rapids, MI.
Leeds & Northrup Co.,	North Wales, PA.
Ling-Temco-Vought,	Honolulu, HI
Ling-Temco-Vought,	Dallas, TX.
Lockheed California,	Burbank, CA.
Lockheed-Georgia Co.,	Marietta, GA.
Lycoming,	Stratford, CT
Martin-Orlando,	Orlando, FL.
MIT,	Cambridge, MA.
Melpar, Inc.,	Falls Church, VA.
Memcor,	Huntington, IN.
Mettler Instrument Corp.,	Princeton, NJ.
Midwest Gage Lab.,	Chicago, IL.
Motorola, Inc.,	Phoenix, AZ.
National Astro Labs,	Pasadena, CA.
Niagara Mohawk Power Corp.,	Syracuse, NY.
Northrop-Norair,	Hawthorne, CA.
Pan Am World Services Co.,	Los Angeles, CA.
RCA,	Cambridge, OH.
RCA,	Camden, NJ.
RCA,	Patrick AFB, FL.
Raytheon Co.,	Charleston, SC.
Rockwell International,	Anaheim, CA.
Sandia National Labs.,	Albuquerque, NM.
Singer Co., Kearfott Div.,	Little Falls, NJ.
Soiltest, Inc.,	Evanston, IL.
Sperry Gyroscope Co.,	Great Neck, NY.
Sperry Rand Corp.,	St. Paul, MN.
Sperry Rand Corp.,	Troy,MI.
SSCO Standards Labs., Inc.,	Southfield, MI.
Stoddart Aircraft Radio Co.,	Hollywood, CA.
TRW,	Redondo Beach, CA.
U.S. Air Force, Aerospace Guidance and Metrology,	Newark, OH.
U.S. Air Force,	Vandenberg AFB, CA.
U.S. Navy, Metrology Engineering Div.,	Pomona, CA.
U.S. Navy, Eastern Primary Std Lab.,	Washington, DC.
U.S. Navy, Western Primary Std Lab.,	San Diego, CA.
U.S. Pacific Missile Range,	Point Mugu, CA.
Vitro Laboratories,	Silver Spring, MD.
Varian Associates,	Palo Alto, CA.
Western Electric Co. Inc.,	Winston Salem, NC.
Yellow Springs Instrument Co.,	Yellow Springs, OH.

A Measurement Manufacturer (Continued from page 10a)

The automated tools used by OEMs to characterize and manufacture new products can be shared with customers - but only if those tools are developed with customer use in mind. Calibration labs can take advantage of automation, capitalize on IP provided by product-focused metrologists, and provide results that help their customers contend with the myriad of market forces.

Pat continued, "New measurement challenges will be found and answered in RF/microwave and optical communications, in genome research, in transportation and utilities, in healthcare, and in other markets striving to use technology to provide improvements in lifestyle, life quality, and life security." While equipment providers are the source of fundamental measurement capability, calibration labs around the world are the means by which we ensure that technology is consistently and reliably applied.

The movement of IP from OEM to calibration labs to customers is becoming as important as the movement of the measurement hardware that has been the mainstay of the Test and Measurement business. Embodied in software tools, training, and techniques, that IP completes a synergistic relationship between OEM suppliers and their customers. It is the only way the full power of OEM metrology can be offered to customers fighting business battles in their own unique environments.

As mentioned earlier, there is an immense satisfaction in being affiliated with an organization whose mission it is to provide and preserve the truth in measurements. As metrologists, test engineers and technology providers, an unwavering commitment to the accuracy, repeatability and correct interpretation of measurements is at the core of our mission. As we strive to continuously improve and to exceed expectations, we always know the target. That is comforting in an otherwise tumultuous world.

About the author

John Herniman began his career in 1985 at British Telecom Research Laboratories. In 1992, he took a senior engineer position with the Hewlett-Packard Fiber Optics Components Operation in the United Kingdom, formerly BT&D Technologies. He joined HP's Fiber Optics Communication Division in 1997, moving to project manager for the division's R&D and production group. In 2003 he became Agilent's Wireless Business Unit Quality Manager, and in 2005, V.P. for Quality in the Electronic Measurements Group.

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BIPM (Continued from page 12a)

Perhaps the major management and organisational problem which faces us is how to squeeze more quarts out of the pint pot--or the metric equivalent. No Government, however well converted on the Damascus road to metrology, is going to double our budgets so we can deal with a doubling of our work. No NMI can do everything, and I'm seeing the start of a sharing out of responsibilities for primary realizations of the SI units so that NMIs are becoming selective and may well serve more than one country's needs. It's a natural response to the market, but it will require an even-handed approach when dealing with possible competitor companies which require calibrations from the same NMI.

At the international level, we took steps to lay the groundwork for this about 5 years ago with the Mutual Recognition Arrangement set up by the International Committee for Weights and Measures. This CIPM MRA assures the equivalence of national standards and ensures that all 160 or so signatories accept calibration certificates from each other at whatever level of uncertainty meets national needs and which has been peer reviewed by experts world-wide. Legislators and regulators are picking up on the benefits this brings, and the contribution it can make to the reduction of technical barriers to trade. To improve our standard of living we all need to increase trade and reduce the obstacles that metrology could introduce if tests and measurements are not accepted. It is a big challenge for us all. So tomorrow's metrologist has also to be trade-aware, and tomorrow's NMI will be part of a more intimate collaboration than exists at the moment.

I've painted a future world where metrology, accreditation and standardisation are interlinked and are vital for developing as well as developed countries. It's a world where our science mingles with the day-to-day needs of more demanding customers as well as customers from new domains which don't speak our language--just as we don't speak theirs. I think we have the institutions that can adapt and respond. I also think we have, potentially, the metrologists who will respond. In 2011, when the next NCSLI commemorative issue is written, our younger colleagues will be the judges of whether we have given them the tools to do the job.

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Accreditation (Continued from page 14a)

NVLAP, by now fully administered by NIST rather than the Department of Commerce, would not proceed with such a LAP without support from its most important constituency, NCSL. A2LA then proceeded with development of its own calibration laboratory accreditation program announced at the NCSL conference in August 1988. The announcement created much curiosity if not outright hostility. Many believed the government should be doing the accreditation. Others wanted the government to stay out of it. Still others said there was no need as calibration laboratories are being assessed multiple times by their customers, largely as a result of Department of Defense contractor requirements.

Progress on International Cooperation. ILAC continued to develop guidance papers on laboratory accreditation on legal, technical, administrative, and trade facilitation topics. Several bilateral Mutual Recognition Arrangements (MRAs) were established between accreditation bodies, some of which included NVLAP with its counterparts in England, Australia and New Zealand..

The Nineties

Development of a National Calibration Laboratory Accreditation Program. After a couple of more years of debate, and under the tireless leadership of Gary Davidson, who represented the NCSL quality management group and the late Joe Simmons of NIST, the NCSL requested that NVLAP make a finding of need for a comprehensive calibration LAP. The request noted the existence of A2LA's program but wanted the calibration community to have a choice of accreditation bodies depending upon their needs.

NIST proceeded with development of its calibration LAP more than a decade after the original findings of need in the microwave and pressure areas. A2LA agreed to cooperate with the NIST decision, even though the Government would be competing with its existing calibration accreditation services, since it believed NIST must be involved as earlier noted.

General Motors (GM), a significant user of laboratories accredited by A2LA and SCC (Standards Council of Canada) since the late eighties, decided in 1999 to expand the list of available sources of acceptable assessment and accreditation to ISO/IEC Guide 25. This was in response to suggestions primarily from quality system management registrars who provided third-party auditing and management system certification to the automotive supplier industry. A number of new for-profit (hitherto unprecedented) accreditation bodies began operations and obtained GM's recognition or listing. GM provides no formal, ongoing evaluation of the competence of the listed accreditation bodies, yet GM now expects that all listed accreditation bodies would accept each other's results.

Coordination Efforts. The need for coordination increased and indeed, there were more intensive efforts made during the nineties. At the behest of ACIL and ANSI, NIST agreed in 1992, to enter into a tri-partite cooperation called the Laboratory Accreditation Working Group (LAWG). After five years of intense discussion of how to reduce the duplication and complexity of the U.S. laboratory accreditation scene, the National Cooperation for Laboratory Accreditation (NACLA) was established and incorporated in 1997.

Progress on International Cooperation. ILAC converted from a conference to a cooperation of accreditation bodies and other interested stakeholders in 1994. In 1999, a commitment was made to establish an ILAC multilateral MRA primarily based upon the results of the two established MRAs of the European cooperation for Accreditation (EA) and the Asia Pacific Laboratory Accreditation Cooperation (APLAC), which were deep into the process of a bilateral recognition between themselves.

The ILAC evaluation of the peer evaluation processes of each region was independently evaluated by a representative of an unaffiliated body and presented to the ILAC General Assembly in 1999. The multi-lateral MRA would supplant the need for several bilateral MRAs. NVLAP and A2LA became the first U.S. bodies to sign the APLAC MRA in 1997. In addition in 1997, A2LA signed a bilateral MRA with EA's MRA signatories to enhance acceptance of the U.S. test results from A2LA-accredited laboratories in the European marketplace. This took six years to accomplish. EA demanded that accreditation of calibration laboratories be required in A2LA's traceability policy in order for recognition to be accepted. EA also required that A2LA stop all quality management system and product certification programs

The "Noughties"

Coordination Efforts. NACLA developed a process for evaluation and mutual recognition of accreditation bodies, an issue revealing itself as quite controversial. In October 2000, the first three signatories to the NACLA Mutual Recognition Arrangement (MRA) were recognized, based on peer evaluations of the Asia Pacific Laboratory Accreditation Cooperation (APLAC) MRA., i.e., A2LA, NVLAP and the Evaluation Service of the International Conference of Building Officials (ICBO ES, now IAS - International Accreditation Services). NACLA has since added five more signatories, but two of the original signatories (A2LA and NVLAP) have since resigned from the NACLA MRA. The jury is still out on whether NACLA will succeed to reduce duplication and complexity with the aim of one accreditation accepted everywhere.

Progress on International Recognition. ILAC established its multilateral MRA with a signing ceremony at the Washington, DC General Assembly meeting in October 2000. NVLAP, A2LA and IAS became the first U.S. bodies to sign the ILAC MRA. A2LA has also entered into the multi-lateral MRA of the Inter-American Accreditation Cooperation (IAAC). IAAC is in the process of having it MRA process recognized and accepted by ILAC.

The Future

Not withstanding discontent in some quarters, globalization is here to stay. This is even more true for global conformity assessment, accreditation and mutual recognition processes. In fact, the global MRA processes will be growing in coverage, effectiveness and acceptability. Trade agreements are beginning to include references to the ILAC MRA. Acceptance of the ILAC MRA will continue to grow. Regulators will slowly follow.

The USA, with its multiplicity of accreditation bodies, does not make it unique in the world. The USA laboratory accreditation schemes need to follow the international rules no differently than any other country. The USA must work within these international processes or be left behind and risk further impediments to U.S. export prospects.

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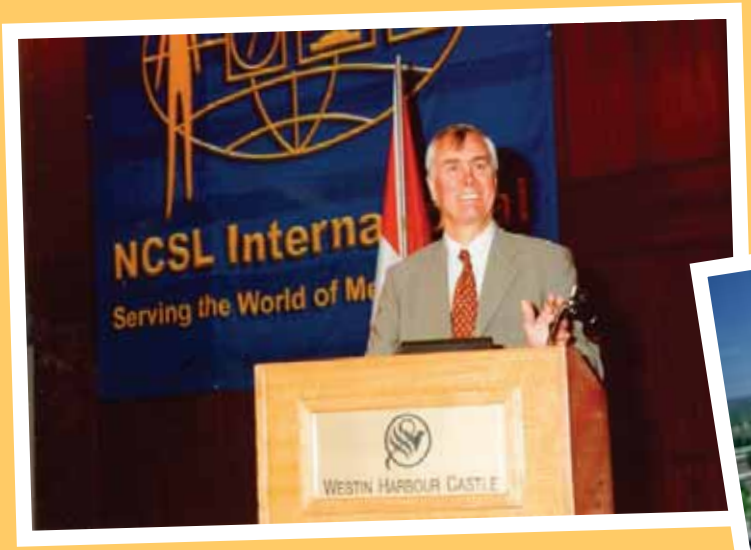
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