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Greetings! I hope you are doing well and are enjoying the beautiful summer weather. I hope you find a moment to take advantage of all the great outdoor opportunities while enjoying time with family and friends as well.

As I write this article, our lab is celebrating World Metrology Day. I hope you also took time to recognize and celebrate the historic day. For our festivities, we enjoyed some delicious BBQ while our laboratory staff attempted to complete a World Metrology Day themed crossword puzzle. This year’s theme was “Measurements in a Dynamic World,” examining measurement science’s immense and rapidly evolving importance within global society. More information about the day is available at www.worldmetrologyday.org and on the NCSLI website.

Be sure to support World Accreditation Day this year and every year as well. The day is the perfect opportunity to celebrate the incredible work associations like ILAC and IAF are doing to express the value of properly accredited laboratories and organizations.

Some quick notes from the Board, first we have reviewed and revised the NCSLI’s Vision and Mission Statement. The two are essential for our organization to stay relevant and useful to our membership, so it is only right that they evolve as our organization continues to grow and prosper. Also, as I have mentioned in my previous articles, the NCSLI Board is focusing on seven key objectives as outlined in our strategic plan, 2020 Vision.

As part of the strategic plan, our sixth objective is for Standards and Publications Development. For 2016, Jeff Gust is serving as the VP of Standards and Practices. While many committees and groups are writing and developing a wide variety of standards and publications, one of the most far reaching efforts involves the work to revise ISO/IEC 17025, General Requirements for the Competence of Testing and Calibration Laboratories.

More details on both the “2020 Vision” and ISO/IEC 17025 revisions can be found within the letter from the Board and in last issues’ article on the ISO/CASCO Working Group 44. I encourage you all to read both and remain up-to-date on NCSLI’s progress and advancements. We will be providing further updates in forthcoming issues of Metrologist, so please be on the lookout for more details.

I’d also like to take a moment to welcome our newest NCSLI members and thank them for their dedication to our global metrology community. We are so pleased to see such renowned businesses and organizations joining us as we strive to meet dynamic measurement challenges. We look forward to working with each of you as we continue to support talented and passionate measurement science professionals.

And speaking of community, this year’s Workshop & Symposium in Saint Paul, MN, is just around the corner! The annual event will be held at the Saint Paul RiverCentre from July 24 to July 28 and focus on the theme of “Measurement Accuracy and the Impact on Society.” The annual NCSLI Workshop & Symposium is one of the best opportunities for measurement science professionals to meet and explore new ideas, innovations, and progress within our growing, global community.

NCSLI is a membership organization, so it functions at its best when members strive to be active and involved with the organization’s evolution and growth. As NCSLI moves forward, myself and the Board will remain diligent in curating passionate community, effective organizational structures, meaningful networking events, and impactful measurement solutions with the help of our exceptional membership.

Thank you all for your support of NCSL International and the measurement science community now and into the foreseeable future.
The 2016 second quarter meeting of the Board of Directors was held April 24-27 in Santa Fe, New Mexico. Nineteen board members were in attendance to address various discussions, challenges, and points of progress within the organization. Key topics of discussion included continued work on an implementation strategy for the Carver Policy Governance model, the 2015 financial numbers, and the ISO/IEC 17025 revisions.

In a special session, a workshop on an implementation strategy for the Carver model to NCSLI and its Board was held. The Carver Policy Governance model is a model of governance designed to help empower boards to fulfill their obligation of accountability for the organization that they govern. The generic nature of the model allows it to be applied to almost any governing body, and its implementation guides leaders to better focus on issues of delegation, management, accomplishment acknowledgment, and leadership.

With this model in mind, the board had the opportunity to reexamine last year’s Strategic Plan, the “NCSLI International 20/20 Vision.” As part of the process and discussion of the governance model, the board has developed and implemented the following revisions to the vision and mission statements for the organization:

**Vision:** Be the world’s recognized source for measurement science expertise and information

**Mission:** To provide the best opportunities for the world’s measurement science experts and practitioners

- To network and exchange information;
- To promote measurement education and skill development; and
- To develop means for organizations to resolve measurement challenges.

The changes to the vision and mission statements reflect the need for clarity and concrete focus as outlined within the model.

The group also discussed the refocus of efforts for the Strategic Plan. Previously, the plan addressed seven focus areas that included topics such as financial stability, top quality products and services, international focus, and education and outreach. Moving forward, these focus areas have been restructured and distilled into three pillars: Finance, Audit & Ethics; Learning and Development; Membership & Marketing.

Additional sessions on the implementation are slated for the July meeting where the membership structure, and the governing documents, will be considered for possible revision. The board is looking forward to continuing the improvement of NCSLI’s structure and strengthening the value of our vision and mission.

In other news, the NCSLI Treasurer, Ingrid Ulrich, gave a presentation to the Board on the financial health of the organization based on the completion of the 2015 financial audit. The numbers from 2015 support that NCSLI stayed in line with its 2015 budget, so let’s continue to keep up the good work!

Finally, the remaining 2016 board meetings are scheduled for July in Saint Paul, MN, and October in Boulder, CO. The board meetings are open to everyone, so we encourage and welcome your attendance and participation.
Welcome New Members

NCSL International Membership opens doors to personal growth and career advancement

AUTOMATED SOLUTIONS/ARREGA INDUSTRIAL
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Automated Solutions/Arrega Industrial is a dedicated company that distributes test and measurement instruments for metrology, inspection and quality applications. We offer numerous solutions for our customers, from simple handheld tools to complex metrology systems. Our team has more than 25 years of experience in metrology and quality applications. Currently, we represent various brands such as Fluke Calibration, Mitutoyo, Vision Engineering, Scienscope, Shine and Dorsey Metrology.

CONTROLS SERVICE, INC
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Controls Service, Inc. was established in 1972, in Dearborn Heights, Michigan, as a field service organization providing maintenance, calibration, repair, and testing services for process control systems. Controls Service, Inc. has maintained an accreditation to ISO/IEC 17025 in the field of calibration through the American Association for Laboratory Accreditation (A2LA) providing on-site services primarily within the industrial manufacturing marketplace.

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DENSO is a leading supplier of advanced automotive technology, systems and components for major automakers. We are committed to making the world a better place through our world-class products and technologies. We are continuously working toward an automotive society where cars put less drag on the environment and drivers have fewer worries about traffic accidents. Our lead in developing this automotive society comes from anticipating the needs of automakers and closely partnering with customers right from the start to develop state-of-the-art systems and products.

Our Mission
To provide the best opportunities for the world’s measurement science experts and practitioners
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HCT is an internationally-recognized calibration laboratory aiming to lead the way in calibration technology for a wide range of industries such as automobile, product compliance testing, medical, and aerospace through continuous technological investments and technical skill development.

QA SUPPLIES, LLC
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QA Supplies, LLC provides hundreds of competitively priced products designed to meet the needs of professionals and assure that the quality of fresh produce and other perishables, including meat, poultry, seafood and dairy, will be maintained. With thermometers, water quality testers, air analyzers, insulated covers, etc., you can find anything you need to monitor, control or evaluate for environmental conditions.
The NCSLI Technical Exchange will build and enhance specific hands-on skills in the calibration of measurement and test equipment. This two-day training will also teach best practices along with introducing new and innovative calibration hardware, software and calibration services. Each training session is taught by measurement science experts from throughout the industry.
Technical Exchange Measurement Training Program

Understanding ISO/IEC 17025 Requirements
Rob Knake, A2LA

Risk Based Thinking in Metrology
Andy Oldershaw, NRC

Measurement Uncertainties
Dilip Shah, E = mc3 Solutions

Root Cause Analysis
Colin Reitman, A2LA

Improved Performance via Process Mapping
Dean Williams, Duke Energy

Achieving Accreditation: Traceability, CMC’s, Software Validation and Assessment Survival
Greg Strouse, NIST

Microwave Measurement Basics
Ronald Ginley, NIST

Understanding RF Power Calibrations at 1mW and 250W
Charlie Sperrazza, Tegam, Inc.

Geometric Dimensioning & Tolerancing (GD&T) Applied to Gage and Fixture Definition
Tony Bryce, Sandia National Laboratories

Vibration and Shock Sensor Theory and Calibration
Eric Seller, The Modal Shop

Good Weighing Practices
Ian Ciesniewski, Mettler-Toledo, LLC

Measuring and Characterizing Surface Topography
Hy Tran, Sandia National Laboratories

Selection, Calibration, and Use of Contact Thermometers
Dawn Cross, NIST

Pressure and Vacuum Measurement
Jacob Ricker, NIST

Flow Measurement and Uncertainties
John Wright, NIST

Realizing the ITS-90 and Maintaining Traceability
Michal Chojnacky, NIST

Temperature Monitoring and Traceability in the Cold Chain
Michal Chojnacky, NIST

Humidity Calibration Uncertainty
Jun Bautista, Masy BioServices

VISIT NCSLI.ORG FOR UPDATES AND CURRENT INFORMATION
STEM the Tide
More Girls in Engineering and Metrology

William Hinton
New Hampshire Statewide Metrology Ambassador

New Hampshire Governor Maggie Hassan welcomed the girls to the first day of the 2016 Girls Technology Day at NHTI (New Hampshire Technical Institute) in Concord, NH. She acknowledged that the gap between STEM (Science – Technology – Engineering – Math) related career opportunities and the available skilled and educated workforce is a serious issue. These thoughts were part of her press release dated March 15, 2016. The Governor is an ardent supporter for STEM related education and in this case the focus is on the girls. In a statement dated January 13, 2015, Governor Hassan observed that “modernizing how we educate our students in the STEM fields of science, technology, engineering and math is critical to helping them develop the skills needed for good jobs in the innovation economy…”

Attendees gather in the New Hampshire Technical Institute STEM.
New Hampshire Senator Jeanne Shaheen stated in a letter dated March 15, 2016 to the GTD organizers that “the number of careers in STEM fields has been growing at such a rate that employers often struggle to find workers with the right job skills. That gap can be closed when all students are given opportunities and encouragement to explore the wonders of science and technology, especially at a young age. Today, women hold less than a quarter of STEM-based careers. That’s why it is so important that we continue to urge our female students to consider and take advantage of the exciting career opportunities available in the science, technology, engineering and mathematics fields.”

New Hampshire Senator Kelly Ayotte provided a video message at the opening ceremonies for the girls and acknowledged the situation where girls are not represented in the STEM fields on a par with their male counterparts. This condition, as noted by Governor Hassan, Senator Shaheen and Senator Ayotte, is why the Girls Technology Day is important to the state and continues to grow every year. NCSLI is proud to support these efforts through our education outreach efforts.

The New Hampshire Department of Education, in conjunction with the Community College System of New Hampshire, local industry and high technology partners again assembled to reach out to New Hampshire girls in the 9th and 10th grades. This age group was selected as the target audience because it is the age at which many young people begin focusing on interests that may ultimately become career paths. Paradoxically, it is also the age at which girls often seem to get “turned off” to math, science and technology.

2016 was the second opportunity for NCSL International to engage this select group of students. The focus was again STEM in general with the focus on measurement and metrology.

The venue grows every year. The initial Girls Technology Day event was held March 14, 2013 on the NHTI (New Hampshire Technical Institute) campus with 120 girls and 10 workshops. The 2016 Girls Technology Day event had 556 registered girls across the New Hampshire Technical Institute and the University of New Hampshire campuses.
KEYNOTE SPEAKERS

Georgia Harris began her work in measurement science in 1985, working as the State Metrologist in Minnesota. She moved to the National Institute of Standards and Technology (NIST) in 1990 and is a Program Leader in the Office of Weights and Measures. Georgia is responsible for the evaluation and recognition of the state weights and measures laboratories and the ongoing training and proficiency testing of state weights and measures metrologists. Her focus is primarily in the areas of mass, length, volume, temperature and time in support of legal metrology.

Kerry Greene has lived at 38 different addresses, studied at four universities, and won on Jeopardy! eight times. She has degrees in biology, psychology, neurosciences and law, and spent 15 years at home raising two children. She currently works as a volunteer for CASA (Court Appointed Special Advocates) of New Hampshire as a guardian ad litem, serving as the voice for children in abuse and neglect cases.

METROLOGY AMBASSADORS

NCSLI Metrology ambassadors work with schools and educators, and while this is usually a small group for a short time frame, the GTD event is magnified and covers multiple days, locations and rotating groups of girls. Lessons learned from previous large events resulted in the use of a production assistant to facilitate the workshop scheduling, obtain photographs and generally help keep the workshop functioning within the timeframe allotted. Abigail Confalone, the 15-year old daughter of workshop facilitator, Gary Confalone, volunteered to fulfill this role with great success.

When Abigail was asked about her experience she responded “In school, I have always been told that the number of women in the engineering fields is lacking. By attending the Girls Technology Day event, it showed me engineering opportunities for women and a chance to see the work that engineers do every day. We saw the impact that the engineering fields have on everyday life and how much their work affects us. Without engineering and metrology, how could we have any of the tools and devices that we have today?”
WORKSHOPS

Twenty-four high schools took advantage of 44 workshops from 56 presenters representing academia and industry along with countless volunteers assisting administration, workshops and an afternoon vendor/college fair. Three sub-workshop experiments were again conducted in the metrology areas of length, temperature measurements and ultrasonic position measurements. Lucas Prato, assisted by his father Jim, a retired physics teacher, facilitated the Faro Edge Arm and presented Metrology – Length – Laser Measurement at the workshops at NHTI while Gary Confalone and Eric Rosenberg provided coverage at the workshops held at UNH in Durham, NH. The operating theory, design and STEM applications for the Faro laser measurement arm along with an explanation of data acquisition were discussed and demonstrated. The girls were allowed to operate the unit, collecting scans of many different objects including facial scans of several of the students. This was a replication of activities the girls performed during the 2015 GTD. A biomedical skeleton was also on loan from the Spaulding High School nursing course. The skeleton was named Ms. STEMfield for the occasion. The girls were taught that scan data was captured as a point cloud in the attached laptop where the rendering could be further manipulated. The technology behind the Faro Edge Arm again made this equipment the star of the show.

State Metrologist Tim Osmer mentored the thermal measurement experiment Metrology – Temperature – Infrared Thermometry. The girls were presented with a selection of materials to be used to construct a wall. The specifications limited the number of layers of material as well as the material requirement for the outer facing surface of the wall for proper Infrared measurement. The four panels were inserted into the test frame with heat source (60 W bulb). The heat source was energized and infrared temperature data was collected and entered into an Excel spreadsheet. The walls were evaluated as to acceptable or poor performance and how the material may have affected the insulating performance. Hinton Technical Services provided
an additional infrared thermometer and a FLIR thermal imaging camera that allowed the girls to scan the thermal insulation experiment as well as to survey the equipment and structures in the venue. Vernier Software and Technology donated the infrared thermometer for future education outreach events after reading about the 2015 GTD activities.

Keynote speaker Georgia Harris mentored the falling object experiment using Vernier equipment provided in kit form by the NCSL International Training Aids Library. The ultrasonic position sensor measures the distance over time as the object falls away from the sensor. Data was collected in a Chromebook running Vernier graphical analysis software. The girls analyzed the velocity of the items (a paper coffee filter and a tennis ball) and proposed why and how drag affected the two items and how this affect can impact the data collected by the system. The slopes of the line segments for the tennis balls were analyzed and acceleration (dV/dt) due to gravity was determined to be 9.8 +/- 0.3 m/s/s using their acquired data.

The issue of a shrinking workforce, skilled in the STEM related sciences is not going to go away without collaboration between industry partners and the educational community with government and regulatory support. The growth in the numbers of girls choosing to investigate STEM related fields and the contribution on the part of educators and industry representatives to engage these girls supports the comments and observations noted by Senators Kelly Ayotte, Jeanne Shaheen and Governor Maggie Hassan.

Senator Shaheen summed it up this way, “Our world is quickly becoming more and more technologically advanced. It is crucial that we inspire and embolden both men and women alike to take part in these scientific developments, as it is fundamental to our economic growth.”

REFERENCES
3 New Hampshire Senator Jeanne Shaheen letter to GTD Organizers, March 15, 2016; available upon request from NCSLI

SPECIAL THANKS
• Spaulding High School’s R. W. Creteau Regional Technology Center for vetting the falling object experiment using the new Chromebook and Vernier Graphical software.
• Vernon Alt for the loan of a LabQuest to support the initial concurrent Vernier experiments.
• William Hinton, NextEra Energy Retiree and Owner of Hinton Technical Services, LLC in Rochester, NH. An NCSLI member since 1996, Hinton is a past NCSLI Board Member currently engaged in writing NCSLI documents and is a New Hampshire Statewide Metrology Ambassador.
The NHSTA (New Hampshire Science Teachers Association) spring conference was held April 2, 2016 at Pinkerton Academy in Derry, New Hampshire. The Magnets & Magnetism workshop was presented again at the request of NHSTA and was again hosted by William Hinton, owner of Hinton Technical Services and long-time NCSLI member. Davita Fortier, Bill’s neighbor and first grade teacher at McClelland Elementary School in Rochester, NH was a co-presenter.

Davita’s students were the catalyst for the first magnets event that Bill presented on World Metrology Day 2015 and became the precursor to the NHSTA workshops on magnets. Leslie McRobie, past president and NHSTA Board of Directors member, was aware of the grade school event and the STEM associated aspects of

First graders on World Metrology Day 2015 – the first magnets event.
the presentation and requested that Bill present a workshop to NHSTA. The
focus was intended to explain how an event is produced and to demonstrate
how student engagement is emphasized through our hands-on success. The
first grade magnets event was also documented in the October 2015 edition
of Metrologist.

It should be noted that this was the second successful workshop following
on the heels of the first workshop presented to the NHSTA during their 2015
fall conference held in scenic Meredith, New Hampshire, on the shores of Lake
Winnipesaukee. As with any endeavor, there are lessons to be learned and
improvements to be implemented. The fast pace and individual engagement
with the attendees resulted in limited time to obtain event photos during the
fall conference. The spring conference included the addition of Bill’s fifteen
year old granddaughter Samantha as a production assistant and photographer.

The workshops provide the teachers with information, resources and
physical experiences that will allow them to produce their own Magnets &
Magnetism event for their students. The success of education outreach events
has always relied on the students, and in the case of the NHSTA group, the
teachers, getting their hands on the equipment and becoming immersed in
the science. Physical engagement with the STEM associated scientific princi-
pies of magnets and magnetism is a powerful link and knowledge is retained.

The attendees were amazed at the power of one of the large, high strength
neodymium magnets. They could feel it twist in their hands when it
approached the steel frame of the demonstration table and the magnetic field
became tangible when it started to sweep the smaller items across the table
toward the magnet. It should be noted here that this group was allowed to use
equipment (magnets) that young school students are not allowed to handle.
The teachers would, however, be able to demonstrate actions using the more
powerful magnets.

Part of the post event communications included distributing copies of the
federal guidelines for product and toy safety where magnets are involved.
Attendees had time to experiment with ferro-fluid filled magnetic flux indi-
cation sheets, hand-wound electro magnets and a tri-axial gauss meter that
reads the strength of the magnetic fields in both gauss (cgs System) and the
tesla (SI System). The gauss unit has officially been replaced by the tesla.

“As an educator in the STEM field, it has become important
for me to understand exactly what the “career
pathway” means for our students in kindergarten
through twelfth grade. My growing awareness
of what manufacturing involves in the 21st century
has changed my outlook about what content
should look like in our schools. Meeting and
talking with people in industry and getting
all of us involved with students in the classroom
can only help schooling change and adapt to the
needs of the 21st century.”

Leslie McRobie, M.Ed
Past President, NHSTA
The attendees were introduced to basic theory and methods to magnetize materials and technology related to the fabrication of rare earth magnets. There were dozens of magnets in many forms including those embedded into household items such as refrigerator magnets, advertising cards, shop tools and one very obscure item…a cow magnet.

The cow magnet is inserted into a cow’s second stomach to capture iron based metals (baling wire, nails, and machine parts from farm equipment) that may be consumed by the animal from the feeding and grazing area. This prevents a condition known as “hardware disease.” If a farmer were to insert a second magnet into the animal, it could cause injury as the two magnets come into contact and pinch the stomach lining. How do they know if the cow already has one inserted? They use a compass which is also a magnet.

There were devices for demonstrating the braking action caused by eddy current (Lenz’s Law) and support stands to hold ring magnets in alignment to demonstrate attraction and repulsion. The high strength neodymium magnets were strong enough to couple completely through the hand and everyone had to experience it. And just like the young students, the attendees tried to see if they would couple through not only their hands but their arms.

The teachers also had an opportunity to replicate the first graders favorite activity, and that was using a magnetic coupled stirrer to produce a “tornado,” actually a vortex. This is the type of hands-on involvement that the young students enjoy and what ties the experience into long term memory.

The spinning coil demonstration using a rare earth magnet stack and a single AA battery was very engaging and the theory of operation takes a student into the STEM world of eddy current, conduction, vector analysis and flux field analysis. Besides, this demonstration has that “wow factor.”

The teachers in attendance, besides delving into the interaction of magnets and their physical characteristics, were provided follow-up communication with additional engineering information related to magnets as well as a link provided by NIST where the teachers can receive a free NIST SI Teacher Kit (http://www.nist.gov/pml/wmd/metric/si-teacher-kit-for-educators.cfm).

It was reported that the National Science Teacher Association wrote a blog article on teaching metrics and the NIST material is an excellent fit.

Thank you so much for the related material and for the presentation at the Conference. It was very interesting, and I can’t wait to bring some of this information into the museum.

Sara Terry
Children’s Museum Dover, NH
A previous visit and impromptu Metrology STEM event last fall was presented to the engineering technology students at the Manchester School of Technology (Manchester, NH). These students, under the direction of their instructor, crafted three of each magnet fixture and provided them to the NHSTA Magnets & Magnetism workshop. All six were distributed to the attendees through a random drawing. This synergy represents a closed loop where the students are giving back to the teachers. This was noted by several of the attendees.

Discussions with the participants identified additional opportunities for education outreach to the participating schools. Additionally, several of the attendees suggested the possibility of peer science teacher visits to schools schedule for events hosted by Bill and his team of NCSLI Metrology Ambassadors.

Profiles:

Davita Fortier, a new board member for NHSTA and a 27 year veteran teaching the first grade at the McClelland Elementary School in Rochester, New Hampshire. She has a master’s degree in education from the University of New Hampshire and over the years held positions as a Math Coach, Technology Leader, LETRS Trainer, Jump Rope (athletics) Coach, PBIS Committee member, Leadership Team member and a new teacher mentor.

Samantha Hinton, a well rounded student with an ‘A’ average at the Derryfield School in Manchester, New Hampshire who competes in school sports as a member of the varsity crew team. She has a third degree black belt in karate, plays the piano, draws professionally and plans to become a neuroscientist.

William Hinton, NextEra Energy Retiree and Owner of Hinton Technical Services, LLC in Rochester, NH. An NCSLI member since 1996, Hinton is a past NCSLI Board Member currently engaged in writing NCSLI documents and is a New Hampshire statewide Metrology Ambassador.

“Being a science teacher who has not had much experience teaching magnetism, this was a great beginner’s workshop. It would be a value to teachers and students to get people from [local] industry who use and manipulate magnets into the classroom. I would imagine that my students would truly appreciate demonstrations and interactive workshops in the classroom.”

Heidi Green, Farmington High School

REFERENCES:

Consumers Energy Laboratory Services employees assisted and sponsored the metrology summer camp, July 11-12, at Monroe County Community College (MCCC) in Monroe, Michigan. This was the first year that the college held this camp for high school student’s grades 9-12 within Monroe County. The goal of the metrology summer camp was to teach students how to design and run measurement calibrations to determine accuracy, precision, reliability, and traceability through the use of various hands-on activities.
Joseph F. Rewerts, Senior Technical Specialist Consumers Energy Calibration and Instrument Services works with a camp attendee.
A camp attendee observes Jeffrey Guigue, Lab Technical Analyst, Consumers Energy Laboratory Services.
Metrology presentations were given on the history of measurement leading up to the present day SI system. The students made measurements and performed calibrations using laser interferometers, temperature sensors, micrometers, torque standard, surface plates, sound and light. A timometer was used to check the accuracy of a few of the students watches. This week long camp was supported by Consumers Energy Laboratory Services, Hexagon Metrology, Mitutoyo, DTE Energy, and NCSL International.

NCSLI temperature sound and light measurement kits were used as training aids during this event.

Subjects covered by DTE Energy’s one day of classes at the summer camp involved presenting material to students about accuracy and precision, the second, the kilogram, and temperature (the Kelvin). A seven question test was given at the beginning of the class to help the instructor determine levels of knowledge already in place.

Exercises, presentations, and hands-on training that occurred during the classes utilized animated cartoons, mass calibration, time experiments, PBS educational videos, and metrology games. For the kilogram, the four minute long SI Superheroes cartoon regarding Monsieur Kilogram, and the other SI Superheroes, vs. Major Uncertainty was viewed. It was clearly noted that the cartoon’s subject matter even included, as a part of the storyline, the development of the Watt balance and the redefinition of Le Grande K. Additionally, after the video students performed a brief calibration using STD masses of an O’haus, Scout balance. Comparisons were also made of readings using different grade (and uncalibrated) masses.

Towards learning about the second, students watched the SI Superhero cartoon about Professor Second and the other SI Superheroes again battling Major Uncertainty. Afterwards, students performed an analysis of the

“Our college receives request every year from Michigan based businesses looking to hire trained metrologists. In the future we hope to expand the scope of this camp to the community.”

Parmeshwar (Peter) Coomar Dean of Applied Sciences and Engineering Technology, Monroe County Community College

“This metrology grass roots effort by MCCC has the potential to improve enrollment in the metrology and quality programs at the college which will lead to future opportunities for employers.”

Robert Sawyer Calibration & Instrument Services Department Head, Consumers Energy Laboratory Services
“I believe that these types of opportunities will go a long way towards making our youth aware of metrology and the opportunities within the field of metrology. The hands-on approach afforded in this setting enhances the videos and lectures provided by the presenters. The kids get to see first hand how metrology affects every aspect of our lives. The hope is that some seeds have been planted and some of these kids will pursue careers in the field of metrology.”

Joseph F. Rewerts Calibration & Instrument Services Senior Technical Specialist, Consumers Energy Laboratory Services

bounces of ping pong balls using stopwatches and charting results to determine frequencies and times between bounces. Finally, a five-minute PBS Nova video (from YouTube) was viewed involving a detailed study of the NIST Atomic Clock at its Boulder, Colorado facility. Positive comments were received about this subject and the video.

Then, a dart board was used for the purpose of teaching students the difference between precision and accuracy. Prizes (SI Superhero Cards) were given to the students who demonstrated the best accuracy and precision with their dart throwing skills.

Next, some discussions and testing occurred involving the Kelvin; variable color pencils donated by NCSLI were used and “tested” in a Hart/Fluke Drywell at varying temperatures and color changes were noted. Open University and NPL of Great Britain videos about the Kelvin were also viewed. Lord Kelvin’s contributions to metrology and the establishment of the Kelvin unit of measurement were then discussed. Students displayed a better than average level of interest while learning about Lord Kelvin.

The MCCC laboratory measurement instrumentation was also used during the session which included a torque calibrator, surface plate, temperature equipment, pressure equipment and general dimensional gaging equipment including gage blocks.

The Monroe County Career and Technical Education (CTE) Committee is a partnership between the Monroe County ISD, Monroe County Community College, Monroe County Business Development Corporation and all nine local school districts. The goal is to develop STEM programs for students in K-12 in every Monroe County school district. This partnership is made up of industry, business, healthcare agencies and computer-aided design (CAD).

The metrology summer camp is part of a larger STEM camp program the college offers which includes courses in cooking, theater, guitar, willpower for girl-power, babysitting safety, arts, photography, dissection, basketball, firearms/rifle safety, volleyball, construction, cars, welding and CAD.

In summary, the students seemed to enjoy the classes and appreciate the new information provided, with special note given to the SI Superhero cartoons and the dart board accuracy and precision exercises. I believe it is safe to say that metrology now has 11 new fans in our world.
Each year on October 14, the members of the International Electrotechnical Commission (IEC), International Organization for Standards (ISO) and International Telecommunication Union (ITU) celebrate World Standards Day. This particular day is a tribute to the collaborative efforts of the thousands of experts worldwide that develop the voluntary technical agreements that are published as international standards.

Standards connect us with reliable modes of communication, codes of practice and trusted frameworks for cooperation. Introducing common interpretations on reciprocal sides of a communication or transaction, standards are essential to mutually beneficial trade and resource efficient international commerce.

Social interaction relies on common respect for fundamental sets of norms, concepts or meanings – international standards codify these norms to ensure that they are accessible to all.

A product or service conforming to an international standard is imbued with a trusted symbol of quality, safety or compatibility. Standards speak to the diversity of our interconnected world, introducing uniformity at the interfaces where we need to be certain that we are speaking on the same terms.”
Stakeholders are crucial to developing valid standards. Once a consensus is reached, all innovators and companies can show that their product or system meets a standard by carrying out the testing protocol. If required, they can also seek certification against a given standard. That's where the American Society for Testing and Materials (ASTM International) plays a strong role: their standards enhance performance and generate confidence for the end user of any product. For over 100 years ASTM has been developing standards with input from stakeholders—users, industry and public—thereby helping the public select materials and systems.

“It is very useful for all stakeholders, but particularly for industry, to know that ASTM standards are referenced thousands of times in international regulations and building codes,” says Dr. Ralph Paroli, Director of Research and Development in Measurement Science and Standards at the National Research Council of Canada (NRC). Paroli is also the 2016 Chairman of the ASTM International Board of Directors. ASTM’s board is made up of 25 leaders from an array of companies, associations and government bodies worldwide.

In 2013, ASTM became an accredited standards developer in Canada, creating a positive and growing impact, further boosting its position as a leading global standards development organization. Since ASTM is accredited by the Standards Council of Canada, those involved in developing a particular standard outside Canada don’t need to repeat the process within Canada. “At the onset, the Standards Council of Canada can let ASTM know that they would like to be involved, and this will help save time, money, and effort,” Paroli points out. “I hope that the long-term impact will be a more rapid harmonization of standards across North America and around the world.”

Reliable and accurate standards play a critical role in ensuring the validity of research, which in turn drives innovation and technology. All research and testing makes use of standards, whether to calibrate an instrument or to ensure that a material meets certain performance criteria. Innovators want to ensure that their technology will be adopted, but for this to happen, end users need to be confident that what they are purchasing will perform as intended.

Normative and collaborative standards provide growth
The National Research Council has a strong relationship with global standards developing organizations, and is involved in their various technical committees including ASTM International. Like ASTM, NRC has been around for a long time, celebrating its centennial this year. The National Research Council plays an important role in strengthening Canada’s innovation landscape. Accurate measurement provided by NRC plays a role similar to ASTM standards, in that it underpins industrial success across all sectors. In fact, metrology is strongly tied to the standards work of organizations like ASTM International, supporting key efforts such as building quality infrastructure. “There’s a natural linkage between developing standards in a process-based organization like ASTM with the measurements for making sure everything turns out right,” says Alan Steele, Canada’s Chief Metrologist and General Manager of Measurement Science and Standards at the National Research Council of Canada.

Connecting research to marketplace success

ASTM and its members value the input and opinion of experts, regardless of the country of origin, in their quest to develop world-class standards. At NRC, Ralph Paroli directs research and development in measurement science and standards (better known as metrology). With more than 30 years of experience in spectroscopy and thermal analysis and over 20 years of experience related to roofing research, Paroli has been involved with national and international committees in developing new techniques to characterize roofing materials and systems. Paroli has been honoured with several awards, and has led several government research projects including roof system performance.

As Canada’s national metrology institute, NRC covers “everything to do with the metric system at the highest level of realization of the basic units of the measurement system,” says Alan Steele. NRC earns the confidence of government and industrial clients through the delivery of high value-for-money scientific measurement services and research. It provides measurement science advice and technical services to government and industrial clients, forming the foundation of fair trade and commerce and enabling market opportunities through evolving and emerging technologies that rely on precision measurement. Among its capabilities, Measurement Science and Standards offers instrument calibration, chemical purity analysis, certified reference materials, mass spectrometry analysis, precision instrumentation and newly developed capabilities in emerging areas such as nanoscale measurements and black carbon emission metrology.

Looking ahead, the need to develop the future generation of leaders and participants is not unique to ASTM activities. It applies to every organization, including NRC.
Third-party calibration laboratories seeking accreditation to international quality standards benefit from NRC’s metrology assessment services, which gives them a competitive advantage. Here are some examples of the ongoing value this team provides to Canadian business and industry:

- The National Research Council maintains the cesium atomic clocks that provide official time signal for Canada. These are accurate to a few millionths of a second per year.
- Companies and laboratories from around the world use NRC’s certified reference materials for environmental testing, food and agricultural products, nanomaterials, stable isotopes and more. NRC’s certified reference materials for biotoxin measurement are used by regulatory labs worldwide to protect the public from shellfish poisoning and facilitate the international trade of seafood products.
- Ionizing radiation can help diagnose and treat disease, but it must be delivered with precision and in doses that meet exacting standards. Proper calibrations ensure that treatment doses are consistent from one patient to another, and they are equally important for clinical trials, where new techniques or treatment regimens must be evaluated correctly.
- “Whiteness” is a key product specifier of paper that translates to its market value. NRC developed a reference instrument for traceable measurements of whiteness that is used to establish the absolute whiteness level for various types of paper. For almost two decades, NRC has been the world’s keeper of optical property reference standards for the paper industry as set out by the International Organization for Standardization.

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The National Research Council regularly adapts its research activities to ensure they are undertaking projects that are most valuable to Canada and its industry. “The R&D Management Team ensures that the investments in science and technology deliver the tools needed by businesses to create jobs and compete in global markets. We work with clients and partners in government to develop solutions for Canada’s needs through innovation, strategic research, and scientific and technical services,” says Paroli.

Investing in the future

Standards facilitate trade and reduce costs between parties. “The harmonization of measurement becomes a part of the fabric of an international trading framework,” says Alan Steele. He points out that accurate measurements and standards provide an evidence basis to fairness. “You want to know that you’re getting what you pay for,” he adds. Since trade informs the market, an optimal way for a small to medium-sized enterprises to understand the market is through participation in a standards development forum where all stakeholders are represented. “You learn about product specifications, packaging, all the details needed to help you be more competitive. At the same time, you get a better understanding of the international situation as well as how to overcome trade barriers through discussions with your peers,” says Paroli.

Looking ahead, the need to develop the future generation of leaders and participants is not unique to ASTM activities. It applies to every organization, including NRC. “The best way to attract new researchers is by doing exactly what ASTM has been doing for as long as I have been involved and longer: ensure that you are leading innovation in well-established areas and keep looking at the emerging areas,” says Paroli.

As is the case with the calibration standards NRC develops, the ASTM standards are held in high regard around the world. In fact, there are very few countries that don’t use ASTM standards. “I am quite honored and humbled to have the opportunity to serve as chairman of the ASTM board in 2016,” says Paroli. “Everyone is there to provide expert opinions and learn from other experts.” And likewise, the expertise at the National Research Council through their Measurement Science and Standards team is sure to plot a well-measured path to economic benefits for industry and society—while NRC, as Canada’s national metrology institute, celebrates a 100-year history of great precision.
**BULGARIA**

On May 20, the Bulgarian Institute of Metrology (BIM), together with the Union of the Metrologists in Bulgaria (UMB) and the State Agency for Metrological and Technical Surveillance (SAMTS), organized a World Metrology Day event entitled Measurements in a Dynamic World.

To celebrate this year’s event, BIM, UMB and SAMTS invite representatives of all the interested parties – the Ministry of Economy, the Bulgarian Institute of Standardization, calibration and/or testing laboratories, the Technical University of Sofia, the Bulgarian Accreditation Service as well as former colleagues involved in metrology activities, producers of measuring instruments, etc.

We would like to congratulate our colleagues all over the world and to wish them a “dynamic growth” of their success and well-being in the future.

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**P.R. CHINA**

AQSIQ, together with Tsinghua University, jointly organized the "World Metrology Day" theme activities in China. Mr. Alan Johnston, CIML Immediate Past President and Prof. Kenneth Grattan, IMEKO President, both gave a speech at the event. Mr. Zhi Shuping, Minister of AQSIQ delivered a keynote speech.
CHINESE TAIPEI

Celebrating the World Metrology Day, BSMI held the international conference BSMI, MOEA May 18, 2016

Metrology is a science that is interwoven with our lives and affects industries and technology. To celebrate the annual World Metrology Day, and in response to the theme "Measurements in a Dynamic World," announced by Bureau International des Poids et Mesures (BIPM), the Bureau of Standards, Metrology & Inspection (BSMI) held an international conference related with current development trends of metrology at the Industrial Technology Research Institute on May 18, 2016.

The conference, hosted by the Deputy Minister of the Ministry of Economic Affairs, Cho Shih-Chao, invited professionals from Taiwan and abroad, including the secretary of Comité international des poids et mesures (CIPM) Dr. James McLaren, and the Vice President of ASUS Strategy Research Office, Henry Yeh. The event allowed participants from industry, government and academia fields to share insights on the recent development of metrology, measurement techniques and applications of metrology in daily life.

Technology is making our day-to-day activities more and more convenient. However, the development of technology requires the support of precision and mature measurement techniques, said the BSMI. Gaining an upper hand in dynamic data measurement is beneficial to developing high technology. Advanced technologies such as high speed disk drives, power grid parameter for renewable energy, Industry 4.0 automatic production system, Internet of things and big data all require high standard metrology measurement. BSMI will continue supporting the development of these technologies to upgrade local businesses through reliable measurement technologies in the 21st century.

ECUADOR

The Ecuadorian Standardization Service (INEN) is part of the National Quality System, whose governing body is the Ministry of Industry and Productivity (MIPRO). One of the four pillars of INEN is metrology and INEN recognizes that the fields of scientific, industrial and legal metrology are vital to the development of science.

With this background, Ecuador joined the global celebrations for World Metrology Day by organizing an agenda that calls for the participation of national and international experts, the local metrological community, and public and private laboratories. This event was organized in order to identify opportunities for improvement and create a national metrological network.

For this purpose, technology was used as a tool that connected our users with the academic communities located in different parts of the country. The participation of university students was encouraged by issuing a certificate to attendees.

Website: http://apps.normalizacion.gob.ec/diadelametrologia/
GAMBIA

The National Metrology Laboratory of The Gambia Standards Bureau joined the rest of the world in commemorating World Metrology Day 2016. The National Metrology Laboratory embarked on the following as part of activities commemorating the day:

- World Metrology Day Radio Talk show on “Capital FM”
- Nationwide outreach program to Major Health Facilities in the country
- Provision of free calibration service for some selected Public Health centers
- Sensitization of Policy Makers on the Importance of Metrology in economic development

IRELAND

NSAI, the Irish National Metrology Laboratory based in Dublin, produced two light-hearted videos on the occasion of World Metrology Day 2016. Watch the videos:

- I’ve a ton of work to do (www.youtube.com/watch?v=WIHbHEpCLDE)
- I’ll be there in a minute (www.youtube.com/watch?v=D_eVkjRMVCI)
To celebrate World Metrology Day 2016, the NCSL International Mexico Region organized a Technical Forum at the newest Pabellon M Convention Center in Monterrey Mexico on May 20, 2016 under auspices of ETALONS Calibration Laboratory. There were 106 registered participants, and 5 exhibitors who displayed their products and services.

The following papers were presented at the WMD celebration in Monterrey Mexico:

- Thermometry (AMS2750 – Pharma) - By Horacio Hernandez and Alfonso Guerra, ETALONS
- Principles of Pulse Oximetry Technology, Romi Uresti, ETALONS
- Defibrillator Energy Calculation, Sergio Rodriguez, BIOMEDEX
- GD&T – Metrology, Felipe Escamilla, Independent Consultant
- Pediatric Weighing Scales, Omar Cardenas, ETALONS
- Calibration Services by Outsourcing, Roberto Benitez Huerta, ETALONS
- GUM Measurement Uncertainty, Antonio Cano, ETALONS

Closing the Forum, Roberto Benitez Chavez, NCSLI Mexico Region Coordinator, provided a detailed overview of NCSL International Recommended Practice RP-6: “Calibration Quality Systems for the Healthcare Industries.”

The following organizations had a booth to show their products and services:

- ASQ Mexico, Daniel Trejo
- MB Instrumentos, Alfonso Altamirano
- Universidad Politecnica de Ramos Arizpe, Laura Cerecero
- Occupational Debriefing, Deyanira Benitez
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NETHERLANDS (VSL)

As in previous years, VSL celebrated World Metrology Day 2016 by launching an animation which shows - in less than 2 minutes - what would happen if metrology did NOT exist!

We brought this animation to the attention of all our partners via email and used all our communication channels and social media to publicize the day.

NEW ZEALAND

This year, Measurement Standards Laboratory, Trading Standards and the Metrology Society of Australasia (MSA) marked the occasion by holding an event at Measurement Standards Laboratory on Friday, May 20, 2016.

The event included tours of the different laboratories, a presentation on redefining the kilogram using the watt balance, workshops and a training demonstration.

For more information visit www.mensor.com or call us at 1-800-984-4200
**PANAMA**

CENAMEP, Panama, commemorated World Metrology Day 2016 by extending an invitation to participate in the Forum Measurements in a Dynamic World. The Forum discussed the contributions of metrology in this changing world, and took place on Tuesday, May 17, 2016 from 6:00 pm to 8:30 pm in the Auditorium (Bldg. 184) of the City of Knowledge, Clayton.

Six experienced metrologists from Argentina, Mexico and Panama gave presentations of 15 minutes each. There were also two round tables, during which the contributions of metrology in technological and industrial progress within these three countries, and the challenges facing Panama in the coming years, were presented.

**PERU**

The Directorate of Metrology of the National Institute of Quality in Perú, Inacal, hosted events for the celebration of World Metrology Day 2016: “The Metrology Week.”

The events took place in Lima city from May 16 to May 20 and included the classic Metrology Symposium in its Peruvian seventh edition. Below is the complete Metrology Week schedule:

- **May 16 - Open Laboratories Day:** The Metrology Direction opened the doors of its Metrology Laboratories for visitors in order to introduce society, industry and students to the work and development in Metrology.

- **May 17 - Course: Commercial Scales - Verifications and Inspections:** Its purpose was to show the monitoring and inspection of commercial scales in public facilities. It was free of charge and aimed at Municipal Authorities and Inspection Organisms.

- **May 18 - Course: Introduction to Chemistry Metrology in Health Sector:** Its purpose was to provide the basis for the metrological aspects management in a clinical laboratory. It was free of charge and aimed at technicians, technologists and professionals of the health and clinical sector in the country.

- **May 19 & 20 - 7th Metrology Symposium in Perú:** This was the main event that closed the Metrology Week with more than 20 Metrology conferences given by international and national metrologists.
POLAND

This year the agenda of the World Metrology Day 2016 celebration at the Central Office of Measures in Warsaw included two main events, which took place on May 19-20, 2016:
- the “Open Day” for the middle school students (May 19),
- the Seminar “Measurements in a Dynamic World” (May 20).

During the first event on May 19, students and teachers saw presentations on measurements in the area of electrical quantities. The presentations focused on ohm’s law and measurements of current ratio, voltage and resistance. The young visitors also had an opportunity to observe differences in power consumption while using a common bulb or LED. They also learned how to calculate electrical power. The conductivity tests of different kinds of materials and different types of resistors, capacitors, voltage sources, etc. were presented as well. The main aim of the presentations was to explain how to use the electrical power economically.

Another important topic of the “Open Day” involved presentations on time measurements. The guests were able to check their watch’s rate and test their time of reaction - in other words their reflex.

In the second part of the World Metrology Day 2016 celebrations, which took place on May 20, the Central Office of Measures organized a seminar on Measurement in a Dynamic World. The agenda of this event included lectures in the field of:
- chemical standards and reference materials;
- changing of measurement units definitions;
- measurement accuracy and practice in metrology.

After the lectures, the participants were invited to visit the laboratories of the Central Office of Measures.

RUSSIA

In connection with World Metrology Day 2016, our Institute of Metrology (VNIIM) maintained a special webpage dedicated to this event, where Russian translations of the Directors’ Messages and Posters are published.

Also, in commemoration of both the Day of Russian Science and World Metrology Day, our Metrology Museum opened an exhibition of scientific metrology artefacts and documents.

During the week (May 17-20, 2016) our Institute participated in organizing and holding the International Innovations Forum and Exhibition “Precise Measurements as the Basis of Quality and Safety” in Moscow which coincided with World Metrology Day.
SAINT LUCIA

Saint Lucia joined the rest of the world in marking World Metrology Day on Friday, May 20, 2016 under the theme "Measurements in a Dynamic World." The Saint Lucia Bureau of Standards, also known as the National Metrology Institute, focused on students in science specifically physics.

The SLBS invited students of Form 4 (Grade 10) Physics classes in the North of the island from six secondary schools to visit our Metrology Laboratory where physics is applied in the verification and calibration of measuring instruments.

The SLBS will once again extend the visit to schools in the South later this year when we observe World Standards Day in October.

This visit to our Metrology Laboratory we hope will inspire the next generation of metrologists, physicists and engineers. Our commemoration of World Metrology Day 2016 is particularly poignant for the SLBS. In November 2015, Saint Lucia became the first Caribbean country, and smallest nation in the world, to receive the prestigious OIML Award for Excellent Contributions in Legal Metrology in Developing Countries.

The Saint Lucia Bureau of Standards is keen to work with students to support interest in science and to raise awareness and promote an appreciation among them for quality and standards.

SAUDI ARABIA

The Saudi Quality Council, under the official patronage of His Excellency the Governor of Saudi Standards, Metrology and Quality Organization (SASO), organized the Seventh Measurement Forum, on May 19, 2016. The forum was in line with the year’s World Metrology Day theme, “Measurements in a Dynamic World.”

SERBIA

Metrology has a long-standing tradition in the Republic of Serbia, and as in previous years, the National Metrology Institute of Serbia - Directorate of Measures and Precious Metals (DMDM) – celebrated World Metrology Day.

Towards Measurements in a Dynamic World, DMDM has produced a leaflet as a part of its promotion of metrology and the importance of measurements in everyday life. This is in addition to laboratory visits which showcased significant achievements and results.

During the first part of the day, students from the Faculty of Natural Sciences and Mathematics, Department of Physics, visited DMDM and were introduced to DMDM’s activities through a brief promotional film. After that they received tours of the various laboratories.

During the second part of the day, DMDM opened its doors to all interested parties, including representatives of the Ministry of the Economy, Faculties and other representatives of the Quality Infrastructure of the Republic of Serbia.
SINGAPORE

As part of the World Metrology Day celebration, the A*STAR National Metrology Centre jointly organized a conference on "Measurements in a Dynamic World" with the Health Science Authority, on May 20, 2016.

Invited speakers shared how measurement sciences, and their applications, can help various industry sectors meet demand from the dynamic and constant evolving global market. Stakeholders and industry players were able to share their insights focusing on measurement needs, challenges and opportunities related to advanced/additive manufacturing, engineering, medical technologies and sensor technologies at the dialogue sessions. There was also a series of exhibitions showcasing advanced instrumentation and measurement technologies for various industry sectors.

SRI LANKA

MUSSD is the National Measurement Institute (NMI) of Sri Lanka, the leading institute of metrology which has responsibilities in the scientific, industrial, and legal metrological framework.

As a special event this year MUSSD declared a "Metrology Week" from May 20-26, 2016. Over this period MUSSD organized many activities to celebrate World Metrology Day with people.

A public awareness program was held on May 20 in Homagama town, which is the nearest town to the headquarters of MUSSD. All the officers participated in this program to make people aware of consumer protection. The program included inspections of the daily market, fuel stations, and awareness of customers and traders of measurement laws. The program continued until May 26.

A one-day special metrology workshop was held on May 25 at the auditorium of MUSSD with a large gathering consisting of experts in metrology and interested technical and scientific personnel. Five distinct experts delivered a series of valuable lectures covering a vast range in metrology and its applications as follows:
- Importance of metrology in quality infrastructure
- Metrology and practical realization of base units
- Metrology in medical physics
- Metrology for laboratory accreditation
- Metrology for consumer protection and the role of MUSSD
On World Metrology Day 2016, Centro Español de Metrología (CEM), in collaboration with Asociación Española para la Calidad (AEC), organized the 7th Intercongress Seminar using this year’s theme, "Measurement in a Dynamic World." The following presentations were given at the Seminar:

- Industry 4.0 and metrology (IK4-Tekniker)
- Strategic plan of CEM (CEM)
- Natural gas quality. Measurements system based on rebuilding thermodynamic state (ENAGAS)
- AEMET observation networks. Measured variables and data quality control (AEMET)
- Dynamic measurement challenge of mechanical quantities (CEM)
- Continuous measurements in structural monitoring (HBM Ibérica)
- Lifecycle of measure in the development of automotive electronic components (Lear Corporation)

Presentations are available on the AEC and CEM websites.
Email: inenlaboratorios@normalizacion.gob.ec
SWEDEN

This year the Swedish Radiation Safety Authority celebrated World Metrology Day by inviting industry professionals to an open house in the following laboratories:

- The Swedish national laboratory for ionising radiation
- The Laboratory for Radon Measurements,
- The Laboratory for Radio Analysis,
- The Emergency Preparedness and Response Mobile Unit
- The Laboratory for Electromagnetic Field Measurements

There were also several brief presentations during the event with metrology as the theme.

UNITED ARAB EMIRATES

The United Arab Emirates joined the global celebrations for World Metrology Day under the 2016 theme, "Measurements in a Dynamic World."

The Emirates Authority for Standardization and Metrology (ESMA) organized a special event on May 19, 2016. ESMA hosted stakeholders from the private sector to participate in this activity, and Mr. Abdullah Almuaini (General Director of ESMA) introduced the celebration by speaking about the 2016 theme. Additionally, he spoke about the importance of the partnership between the public and private sectors for continuous improvement in the metrology sector.

Eng. Amina Zainal (Director of the Metrology Department) talked about ESMA achievements over the last two years related to metrology. UAE became a full member of the BIPM in 2015; ESMA also signed the CIPM-MRA in 2016. This activity focused on the vision of ESMA for 2021 in metrology and on sharing ideas with stakeholders in laboratories and private sectors.

UNITED KINGDOM

As part of the celebrations for World Metrology Day, NEL, the UK’s National Measurement Institute for flow measurement, was open to the public on Wednesday, May 18.

This gave visitors a chance to see our world-class flow measurement facilities, and find out more about our recent upgrades. During the event visitors also had the opportunity to chat with our flow measurement experts and discuss the latest developments in flow measurement.
UNITED KINGDOM

As part of the National Physical Laboratory’s World Metrology Day celebrations this year, NPL opened its doors to the general public for NPL Open House 2016 with over 3,000 people visiting to see some of the amazing research that goes on at the UK’s National Measurement Institute.

Visitors were able to see how NPL’s measurement expertise ensures that all measurements made in the UK can be traced back to highly-accurate standards, ensuring consistency and reliability. Over 40 laboratories were open, covering everything from acoustic measurements to our ionising radiation research, and the laboratories relating to each of the seven SI base units.

NPL’s work helps tackle some of society’s biggest challenges, from understanding climate change to fighting cancer. Visitors were able to see how NPL scientists accurately measure many aspects of the world around us, from time and temperature, to cosmic rays and climate change. They also were able to see first-hand the cutting-edge research being carried out in emerging fields like graphene, nanotechnology, smart textiles and 3D printing.

In the Electron Microscopy Laboratory, visitors could watch their names being written using 50 nanometre dots of platinum, one thousandth of the width of a human hair. The dots were deposited in patterns to write their names. In the image to the left, there are over 50 names, which could all fit on the end of a hair. At this scale, the entire text of War and Peace could be written on the back of a postage stamp over 30 times. This provided visitors with a sense of the microscopic scales at which measurements can be made to understand how materials behave.
VIETNAM

On World Metrology Day 2016, under the sponsorship of the Directorate for Standards, Metrology and Quality (STAMEQ), the Vietnam Metrology Association (VINAMET) and the Vietnam Metrology Institute (VMI) co-hosted a seminar to promote this year’s theme, “Measurements in a Dynamic World” in Hanoi, Vietnam.

Attendees contributed ideas to the Draft of the Government Decree on verification, calibration and testing management of measuring equipment. Vietnam’s national measurement standards system was presented at this event, through which the 2016 World Metrology Day theme was clearly and widely disseminated to stakeholders throughout Vietnam.

Also on World Metrology Day, all VMI’s calibration laboratories were open to any individuals who are interested in visiting them.

The 6270A Pressure Calibrator lets you mix up to five measurement modules so you can calibrate a wide variety of pressure gauges and sensors with a single instrument, from vacuum to 20 MPa (3000 psi). Two levels of accuracy let you match each module to the appropriate workload and requirements.

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Letter from Europe: Product Safety

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Following the article on the Role of Measurement and Testing to Characterize Materials and Products (Metrologist July 2015), this Letter deals with Product and Industrial Safety. It is based on a survey about European Research in Industrial Safety by Dr. Jürgen Lexow, BAM Berlin, and on the results of an International Safety Conference (Brussels, November 2015) jointly organized by CEOC, the International Confederation of Inspection and Certification Organisations; IFIA, the International Federation of Inspection Agencies; and EUROLAB, the European Federation of National Associations of Measurement, Testing and Analytical Laboratories (www.eurolab.org.webloc).

The Meaning of Reliability, Risk and Safety

The probability that a technical item will perform its required functions without failure for a specified time period (lifetime) when used under specified conditions is called reliability. Risk is the combination of the probability of an event and its consequence. In a technical environment, risk may be described in terms of the probability of an event leading to damage and the expected severity of damage. Safety is freedom from unacceptable risk. Safety is not a fixed value but it has to be defined in terms of risk and considering the chances as well as the potential failure. It is upon the stakeholders to agree in a social decision on a maximum acceptable risk that may be associated with the application and use of a product.
The European General Product Safety Regulation

To facilitate the free movement of goods, persons, services, and capital – while protecting essential public needs, e.g. safety, health, environment – the so-called New Approach was established 1985 in the European Union (EU) as flexible regulatory framework for market and trade. Within the EU, goods move freely and consumers and businesses can buy and sell products in the 28 EU Member States and the 3 EFTA/European Economic Area countries with a total population of more than 500 million.

The General Product Safety Directive (GPSD, 2001/95/EC) applies to all suppliers, e.g. manufacturers, importers, retailers, distributors, those who rework, repair or modify, service providers etc., but only if they are supplying a product as part of a commercial activity. It does not apply to personal transactions. The regulations place an obligation on suppliers for their products to be safe. They are required to provide consumers with all relevant safety information for safe use and to keep themselves informed of the risks. Suppliers are required to inform the authorities when they discover that they have placed an unsafe product on the market. For the supply of non-compliant products, there is a penalty. For example, in the UK it is 12 months imprisonment and/or a £20 000 fine.

The producer is specifically required to provide information to enable consumers to assess the risks inherent with the product and provide information on precautions to avoid them. Adopt measures to enable a product user to be informed of the risks (e.g. recording safety related returns) and where necessary, enable him to withdraw unsafe products from the distribution chain. Such measures may include: provision of appropriate marking of product with the name and address of the producer, serial and model numbers, investigation and recording of complaints, and sample testing of products on the market.

Assessment of Product Safety

The role of Testing, Inspection and Certification (TIC) to assess product safety was discussed at the 2015 International Safety Conference in Brussels, and results of the 2015 IFIA – CEOC Market Study were presented. The aim of the study, which has been carried out for four consecutive years now, is to gauge the effectiveness of securing safety of consumer products by comparing (a) the self-declaration system of producers and (b) third-party testing and certification. This year the study focused on household appliances (e.g. electric fans, room heaters, luminaires, small power tools) purchased online, both in the EU, and the USA and Canada. The results were in line with the outcomes of the previous IFIA – CEOC studies:

a. 77% of the self-declared products (319 samples from the EU) were not in compliance with the relevant legislation, 14% had safety critical failures.

b. among the third-party certified products (139 samples from the EU and 185 from the USA and Canada), there were only 0.7% and 1% products respectively that showed safety critical failures.

It was concluded that in the assessment of product safety, the application of third-party testing, inspection and certification can reduce significantly the number of non-compliant products on the market, thereby increasing the safety of consumers significantly.
The European Technology Platform on Industrial Safety

In order to enhance research investment in industrial safety, the European Technology Platform on Industrial Safety was set up (www.industrialsafety-tp.org). It is an industry driven forum representing enterprises from chemical, oil, automotive, energy, transport, food, construction, and manufacturing industries, including reinsurers as well as academia and regulating authorities. Today, it is an open forum of more than 800 experts who share ideas, prepare future work and disseminate results in focus groups, technical workshops and conferences. ETPIS provides input to education and training. It is in a continuous exchange of thoughts with the European Commission (EC) and was evaluated by the EC in 2013 and confirmed as a valuable partner to provide advice and insight to trends in industrial safety. The activities of ETPIS can be illustrated with the following examples:

- In the large integrated research project, *Early recognition, monitoring and integrated management of emerging, new technology related risks*, initiated by ETPIS and supported by the European Commission, 87 companies and organizations combined their research efforts and prepared 240 official deliverables, i.e. reports, documents, software and demonstrators. One of them is the pre-standardization CEN Workshop Agreement “Managing emerging technology-related risks.” This pre-standardization document provides guidance in the Emerging Risk Management Framework and is not specific to any industry but can be applied in all industries and sectors. (www.integrisk.eu-vri.eu/)

- In another ETPIS initiated and EC supported project, 20 partners from 11 European countries and regions coordinated their research programs. This project, *Coordination of European Research on Industrial Safety towards Smart and Sustainable Growth - SAFERa* (www.safera.industrialsafety-tp.org), is built on the assumption that the sustainable presence of industrial activity, developing essential economic added value, rests upon continued acceptance by the population, on continued reduction of the environmental impact and of risks to workers and local citizens. Insights from safety research can help achieve these goals whilst also reducing losses, providing a competitive advantage to the industry.

Future research needs on industrial safety were discussed with stakeholders in an EC workshop. Five main challenges for safety research have been identified:

1. New materials
2. New emerging technologies
3. Workplace and different types associated with it
4. Integration of safety and security
5. Communication and trust building

A vision that combines the various aspects and lines of discussion is demonstrated in the “Common House of the European Industrial Safety.” The three main pillars are (i) conventional risks, (ii) safety technologies/products/services, and (iii) emerging risks. They have in common the disciplines risk governance, precautionary and evidence-based approaches, sustainability, standardization, reporting and management systems. Their applications go into the various sectors of manufacturing, building and infrastructure, process industry and many more.

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### Common House of European Industrial Safety

<table>
<thead>
<tr>
<th>Conventional Risks</th>
<th>EU Safety Technologies</th>
<th>Emerging Risks &amp; Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU Directives and national standards</td>
<td>Advanced methods</td>
<td>Stakeholders’ involvement</td>
</tr>
<tr>
<td>Compliance and responsibility</td>
<td>Leading competence</td>
<td>Identification &amp; Monitoring (E2R2)</td>
</tr>
<tr>
<td>Safety culture &amp; infrastructure</td>
<td>(integrated) Tools</td>
<td>Dedicated projects</td>
</tr>
</tbody>
</table>

**Applications:** Manufacturing, Buildings, Process industry, ...

**Impacts:** Health, Safety, Environment, Society, Economy, Business Continuity,...

*Source: ETPIS*
EURAMET Plans Further Collaboration with NCSL International

In 2015, a Memorandum of Understanding was signed by NCSL International (NCSLI) and EURAMET marking a long tradition of collaboration. At the EURAMET General Assembly a few weeks ago, NCSLI and EURAMET met to discuss further steps. “Both organisations have and will continue to benefit from the exchange of information,” says EURAMET Chairperson Beat Jeckelmann. “A major goal is the development of technical position papers and documents that are mutually beneficial to the organisations, their membership and the metrology community at large.”

“NCSLI and EURAMET are leading technical organisations that work to promote advancement in metrology and the measurement community. I believe both organisations benefit by participating in each other’s annual meetings and by sharing technical documents such as EURAMET’s calibration guides. Through our continued interaction, we can further build and enhance our partnership,” comments Roger Burton, NCSLI President.

Already in 2007, NCSLI and EURAMET signed their first letter of intent and became liaison organisations. NCSLI is a professional trade organisation located in Boulder, Colorado (US). Its mission is to “provide the best opportunities for the measurement science experts and practitioners regarding exchange of information, promotion of measurement education and to develop means for organisations to resolve measurement challenges.”

The membership is open to any organisation with an interest in measurement science and its applications in research, development, education and commerce. Members are companies, organisations, individual professionals and students. This wide representation of experience provides an opportunity to exchange ideas, techniques and innovations with others engaged in the measurement science community.

NCSLI was formed in 1961 to promote cooperative efforts for solving the common problems faced by measurement laboratories. Today, NCSLI has over 1000 member organisations from academic, scientific, industrial, commercial, and government facilities around the world.


One of the main events of NCSLI is its annual Workshop & Symposium. This year’s topic is “Measurement Accuracy and the Impact on Society.” The five-day event from July 24 to 28, 2016, in Saint Paul, Minnesota will bring measurement science experts and professionals together to share the latest and most relevant news, experiences and stories relating to metrology’s place in society.

The conference offers multiple ways to network with industry professionals and includes hands-on tutorials, technical papers, poster presentations, keynote addresses, exhibition hall, committee meetings and networking.
Thunder Scientific Corporation Celebrates 50 Years

By Vaune Jancula
info@thunderscientific.com

Incorporated in 1966, Thunder Scientific Corporation is a privately-held company headquartered in Albuquerque, New Mexico. Thunder’s founder, Paul Bennewitz, was considered by many as a key inventor of humidity instrumentation and devices.

During the 1970’s, Thunder perfected its Model 4A-1 Laboratory Reference Psychrometer to be the most accurate humidity measurement system available at the time. In 1976, the Canadian Standards Lab purchased Thunder’s first Model 6000 Divided Flow System. Next came the Model 6500 Manual Humidity Generator in 1979, and in 1988, the Model 8500 became the first automated humidity generation system. These early years also saw the development of solid-state sensors that were onboard four of NASA’s space shuttle missions during the 1980’s.
The Model 2500 Benchtop Two-Pressure Humidity Generator, Thunder’s flagship unit, rolled out in 1991. Built for reliability and sustainability, some of these original systems are still in use in the field today. The 2500 continues to be the core of Thunder’s humidity generator business.

Thunder’s products have always been traceable to the International System of Units (SI) through NIST-maintained standards. In 2003, Thunder obtained NVLAP accreditation, as well as a GSA contract for Federal agency purchasers.

For 50 years, Thunder has been the world’s leading manufacturer of humidity generators, and is a leader in calibration services, and software products for humidity analysis, calibration and measurement. Thunder Scientific Corporation is proud to offer these innovations to its national and international customers, and looks to the future to continue providing high-quality humidity measurement products to the global market.
Dean Brungart
1927 — DECEMBER 13, 2015

BRUNGART, Dean Albert November
1, 1927 - December 13, 2015 Santa
Rosa, California Dean Brungart
passed away peacefully at age 88,
of heart and kidney disease. He was
born in Centre Hall, PA, in the same
valley his ancestors had lived since
the 1770s. After graduating high
school in 1945, Dean joined the Army
Air Corps for three years. There he
became one of five Weather Radar
Observers in the Air Corps and was
sent to Panama in 1946 on a special
program where he was stationed
in a weather tower on an island in
Gatun Lake in the middle of the
Canal. He was honorably discharged
with the rank of Sergeant. In 1948,
he visited Los Angeles and decided
to stay. He obtained an Advanced
Degree in Electronics, Radio and
TV from National Schools and went
to U.C.L.A. for an M.S. in business.
He met his beloved wife, Carolyn,
at Hollywood Presbyterian Church,
introduced by his childhood friend,
Taylor Potter, and they were mar-
ried in 1952. Dean worked at Hughes
Aircraft Company and they lived in
Westchester CA where they had two
children, Sherri and David. They
moved to Woodland Hills CA in 1962.
Dean worked at Litton Industries
starting in 1961 and Teledyne
Systems in 1992, managing divisions
which calibrated equipment for
many companies, including NASA
and the U.S. Air Force, He was named
President of three professional orga-
nizations, Precision Measurement
Association, National Conference
of Standards Laboratories, and
Measurement Science Conference
and received each organization’s
highest award for contribution to
the measurement community. With
an empty nest in 1979, Dean and
Carolyn moved into their dream
house in Malibu Lake in the Santa
Monica Mountains where they had
many wonderful years and went on
adventures to countries around the
world. In 1994, when Carolyn was
diagnosed with ALS (Lou Gehrig’s
disease), they moved north to San
Rafael where Dean was her primary
caregiver until her passing in 1999.
The bright spot of these years was
being able to spend more time with
their granddaughter, Freedom, and
daughter, Sherri. Dean moved into
Spring Lake Village retirement com-
community in Santa Rosa in 2003 and
was glad to be with such a wonder-
ful group of people. He was proud of
his contribution as Chairman of the
Fire & Rescue Committee and loved
his weekly billiards game as well as
his nightly hosting of a dining table
for seven. Over the years, Dean was a
member of Hollywood Presbyterian
Church, Woodland Hills Presbyterian
Church, Bel Air Presbyterian Church,
Community Congregational Church
in Tiburon and Spring Lake Village
Chapel in Santa Rosa and Dean very
much enjoyed the fellowship and
being involved either as an Usher,
Deacon or Ruling Elder. Dean is sur-
vived by his daughter, Sherri; son,
David; granddaughter, Freedom; as
well as his nephews and nieces and
many wonderful friends. Private ser-
vices will be held. In lieu of flowers,
please send charitable contributions
to The ALS Association Golden West
Chapter at: www.alsagoldenwest.
org - See more at: http://www.legacy.
com/obituaries/pressdemocrat/obit-
uary.aspx?pid=176920617#sthash.
gkmdPoMk.dpuf
William F. Doyle (Bill) was 72 when he lost his battle with various cancers due to surgical complications, infections and organ failure(s) on February 29, 2016. Bill retired from the United States Air Force relocating to Texas from Virginia where he and his wife, Erlinda, lived for over 32 years. He had a long and successful career in Quality Assurance, including serving as President of the NCSL in 1995.

Bill enjoyed website and program/software development, home improvement and trips to the casino. He was known for his warm and forgiving heart, his ability to effectively and methodically complete projects from beginning to end and most definitely, his generosity. He would gladly give anyone in need, the shirt off his back – even if he had nothing. Hard working and a man of his word - that was Bill.

Honoring his wishes, no viewing or funeral services were made. He was cremated on Saturday, March 5, 2016. He is survived by his wife, daughter, granddaughter, grandson, niece and 2 nephews.

Bill will be deeply missed by his family, friends and colleagues here in the U.S., the Philippines and across the globe.

Dr. Bryan Kibble was born in 1938 in Berkshire. He studied Physics at Jesus College, University of Oxford, where he was awarded a DPhil in 1964 for research in atomic spectroscopy. Dr. Kibble continued his research as a Postdoctoral Fellow at the University of Windsor in Ontario, Canada, from 1965 to 1967, before joining NPL as a Senior Research Fellow in 1967.

Early impact on the SI units
Early in his NPL career, Dr. Kibble successfully measured the high field gyromagnetic ratio of the proton. This measurement, in conjunction with a similar low field measurement, indicated that there was a problem with the existing realization of the ampere, the SI base unit of electrical current. At the time, the ampere was realized using the current balance, an instrument that was difficult to operate and that had a number of inherent limitations, which Dr. Kibble was later to address.

Dr. Kibble also worked with Dr. Geoffrey Rayner on Coaxial AC Bridges and the calculable capacitor from which the SI definition of the unit of resistance, the ohm, could be established. In 1984, Dr. Kibble and Dr. Rayner compiled and published their research in the book, Coaxial AC Bridges

The imperfections of the current balance weighed on Dr. Kibble’s mind and inspired him to conceive a new and improved instrument, the moving coil watt balance, which, together with the calculable capacitor realization of the ohm, could replace the current balance.

Invention of the watt balance
In the early 1970s, Dr. Kibble had an idea for a measurement device that would supersede the current balance. He described his idea to Bob Cutkosky, a highly-respected metrologist.
experimental scientist visiting from the USA’s National Institute of Standards and Technology (NIST). Cutkosky’s response encouraged Kibble to proceed with the idea and also planted the seeds for similar developments in the USA, which were pursued by his friends Ed Williams and Tom Olsen.

In 1978, the Mark I watt balance was built at NPL with Dr Ian Robinson and Ray Smith. The instrument was used to realize the ampere with greater accuracy than was possible with the current balance, and the results played a major role in setting the 1990 conventional values of the Josephson and von Klitzing constants; used today for electrical measurements throughout the world. In recognition of his work, Dr. Kibble was awarded the International Union of Pure and Applied Physics SUNAMCO Senior Scientist Medal in 1992.

Redefining the kilogram
The kilogram, the SI base unit of mass, is the last of the seven SI base units to be defined by a physical object. This will officially change in 2018, when the kilogram will be redefined in terms of a natural constant, the Planck constant; the quantum of action in quantum physics.

In 1990, a second watt balance was built by Dr. Kibble, Ian Robinson and Janet Belliss at NPL. It was designed to operate in a vacuum and was intended to measure the Planck constant with sufficient accuracy to support the redefinition of the kilogram.

The watt balance compares the weight of a one kilogram mass to the electromagnetic force generated by the interaction of a current-carrying coil of wire and a magnetic field. Then, the same coil is moved with a measured velocity in the same field, and generates a measured voltage. The combination of these two parts enables the properties of the coil and magnet to be eliminated from the measurement and allows electrical power and mechanical power to be equated. Using the Josephson and quantum Hall effects, electrical power can be measured in terms of the Planck constant and time, which allows the watt balance to relate mass to the Planck constant and SI units of length and time. By changing the definition of the unit of mass within the SI to fix the value of the Planck constant, the last artefact standard in the SI – the platinum-iridium cylinder kept at the International Bureau of Weights and Measures (BIPM) in Paris - can be replaced and, by the additional fixing of the value of the elementary charge, the electrical units can return to the SI.

In 2014, Dr. Kibble and Dr. Robinson published new principles for building simple watt balance designs and making the instrument more accessible. In 2014, Canada’s National Research Council used the NPL Mark II watt balance to measure the Planck constant with sufficient accuracy for the redefinition. A fitting tribute to Dr. Kibble’s visionary work, from 2018 and beyond the watt balances should be used throughout the world to realize the kilogram definition.

An active retirement
Dr. Kibble retired from NPL in 1998, but continued to be active in the field. He worked on the Mark II watt balance and high-frequency standards and bridges at NPL. He also became a guest worker at both the Physikalisch-Technische Bundesanstalt (PTB) and BIPM, where he played a key part in eliminating a number of unresolved problems with the measurement of the ac quantum Hall effect.

Dr. Kibble continued to be active on various international committees. In 2009, he won the IEEE Joseph F Keithley Award in Instrumentation and Measurement and was invited to write a regular column for IEEE Instrumentation and Measurement Magazine. In 2010, he published a book with Jurgen Schurr and Shakil Awan, Coaxial Electrical Circuits for Interference-Free Measurements.

Dr. Kibble gave his last talk at NPL on 17 March 2016, describing the invention and development of the watt balance to an audience of current and retired NPL staff, and members of the Institute of Physics and the British Society for the History of Science.

A Fond Farewell
Dr. Bryan Kibble exemplified what metrology could offer the world in almost every facet of his life. His passion and dedication has led to discoveries and ideas that will continue to influence us now, in 2016, and into the foreseeable future. Dr. Kibble was a patient, generous, brilliant, and deeply beloved human being. It is with a heavy heart that the global measurement science community says farewell to one of its most influential thinkers.

Thank you so much Dr. Bryan Kibble for your accomplishments, dedication, and friendship. You will be greatly missed.
David E. Nebel
1937 — APRIL 18, 2016

David E. Nebel, age 78 of Centerville passed away unexpectedly on Monday, April 18, 2016. He was born on August 17, 1937 in Milwaukee, WI to the late, John Edward and Margaret (Libby) Nebel. He is survived by his loving wife of 48 years, Dana (Morgan) Nebel; children, Ruth Anne Cox, Katherine (Charles) Dewitt, Patricia Aileen (Jeff) Bedard; grandchildren, Michelle Leibold, Elwyn Leibold, Dana Marie Nebel, David Andrew Cox, Cody Clark, Brett Matthew Bedard; siblings, Judith (Ron) Ramlow, Kathleen (Bob) Ruhe, Thomas (Nancy) Nebel, Michael (Connie) Nebel; and many other extended family and friends.

He had served in the Civil Air Patrol, Air National Guard and the Air Force. He retired after 28 years as a Senior Master Sergeant.

Kenneth N. Parson
1934 — OCTOBER 1, 2015

Our dad passed away peacefully at home with our mom and their children at his side. He is survived by his beloved wife of 62 years, Joanna; three sons: Phil (Missy), Gary (Karen) and Ray; one daughter, Teri (Bruce); eight grandchildren and nine great-grandchildren.

He was born in Edmonton, Canada, living there for eight years before moving to Vallejo, California. At age 16 he earned his pilot’s license. He and Joanna met while seniors in high school. They married a year later (1953) during which time he entered the Air Force, serving for four years. In 1965 he moved the family to Poulsbo, working at Bangor until his retirement in 1989 then moving to Lake Elsinore, California. He earned his MBA from Pepperdine University in 1991, while at the same time working as a laboratory quality management consultant that had him traveling the globe until he was 74. They moved back to Washington in 2001. He published a book, “Laboratory Quality Management” in 2012.

Dad’s passions were flying, photography, travel, hosting parties and cooking. Though, his true passion was our Mom and our family. We are hosting a celebration in his honor on November 7th at 2 p.m., Raspberry Ridge Farm, 21614 Big Valley Road, Poulsbo.
2017 NCSLI Workshop & Symposium

August 13 - 17, 2017

Precision & Performance with Measurement Science

Gaylord National Convention Center  |  National Harbor, Maryland
As standards laboratories, the world expects and critically depends upon, the very best from us. So naturally we must demand the best from ourselves.

That is why we periodically agree to hold our personnel, policies, and procedures to ever higher standards. Now is one such time, as our community begins to adjust to new, more stringent requirements specified in the impending revision of ISO/IEC 17025. It marks the first time in 16 years that the principal benchmarks for quality and integrity in testing and calibration will be changed.

Those new criteria will require us to re-examine the ways in which we ensure traceability, bring new clarity to the statements of compliance, improve methods used to evaluate and state uncertainties in measurement, review how we handle technical records, manage information, and structure management systems, among other changes. The impact will be felt not only in calibration laboratories, but in manufacturing, research, quality control, education and training, and proficiency testing.

How will you and your organization respond to the update of ISO/IEC 17025? Do you have implementation plans that you can share with others? Are there provisions of the revised standard that are particularly hard to meet or that will require new ways of doing business? How will it affect evaluations of competence or accreditation in your field? We invite you to submit papers and/or suggest a panel session on these issues and related topics for the coming 2017 NCSL International Workshop & Symposium.

No doubt there will be some significant challenges in complying with the new standards. But if we pool our ideas and expertise, we can make a smooth transition and further strengthen the trust and respect we earn from our clients and customers.

GENERAL REQUIREMENTS
Abstracts are required for all proposed papers, panels and workshops.

ABSTRACT REQUIREMENTS AND DEADLINE
Abstracts must be 350 words and submitted electronically using the NCSLI Abstract Management System no later than January 6, 2017. After paper acceptance, speakers will be sent a new link where they will upload their papers.

ABSTRACT ACCEPTANCE DATE
Speakers will be notified on or before January 31, 2017 if their abstract has been accepted. Once abstracts are selected for the NCSLI Technical Program, authors will be provided manuscript instructions.

MANUSCRIPT REQUIREMENTS AND DEADLINE
All manuscripts must be uploaded by April 3, 2017. All papers received by the manuscript deadline will be included in the NCSLI International Conference Proceedings CD.

SPEAKER DISCOUNTS
• All speakers who upload their abstract by the January 6, 2017 deadline (and are accepted) will receive a $150 discount off of registration.
• All speakers who upload their manuscript by the April 3, 2017 deadline will receive a $350 discount off of registration.
• All deadlines must be met to receive the speaker registration discount of $500.

BEST PAPER AWARDS
To be considered for the Best Paper Award, all deadlines must be met.
Committee 157 is designed to attract the attention of Early Career Professionals in Industry and Military toward NCSL International (NCSLI) and all it has to offer. The purpose of the committee is to expand the NCSLI membership network to include the aforementioned audiences into active roles that will carry on the vision and mission of this organization.

There is currently a generational gap between the typical NCSLI member and the “millennials” coming into the industry from school, other careers, or transferring out of the military. Committee 157 seeks to bridge that gap and integrate the two perspectives. Through knowledge transfer and sharing from both sides, NCSLI will become a stronger, more unified organization.

Four targeted areas have been identified as opportunities for the inclusion of new members: Technical Training, Job Search Support, Military Connections and Mentoring. Each of the four core pillars will be expanded into fully functioning resources for current and perspective members to utilize.

With these pillars in mind, there are a number of resources at our disposal that can help to support NCSLI’s efforts to guide the next generation of measurement science professionals. For starters, our world continues to become increasingly viral with social media and various outreach programs that can be utilized to attract college students, military personnel and other young professionals to the world of test and measurement. There are a large variety of resources and events geared towards education and skill development as well that are a vital resource to those new to the test and measurement industry. Opportunities exist to contribute to the measurement field by writing and presenting technical papers and posters along with networking among other industry professionals.

Technical training is an excellent opportunity to gain marketable skills and improve the quality of work being performed. Engaging with the military measurement community will foster a stronger relationship with those individuals transferring into a civilian career. Committee 157 will only be successful with the support of current NCSLI members who will be the driving force supporting these plans and programs to share knowledge, experiences and opportunities with those new to the industry. These opportunities are intended to increase membership as well as engage all members who would like to become more involved in NCSLI, but don’t have a feasible avenue to do so.

If you would like more information or to create discussion about the new committee, please reach out to us via the NCSLI Early Career Professionals LinkedIn group to get involved!
QUALIFIED STUDENTS ARE ENCOURAGED TO APPLY

$3000 SCHOLARSHIP

Completed applications are due March 1

For application forms or more information contact your advisor, student aid office, or the Scholarship itself at:

SimmonsScholarship@ncsli.org
www.ncsli.org (search Simmons)
Submit to:
Simmons Scholarship
2995 Wilderness Place, Suite 107
Boulder, CO 80301
The NCSL International (NCSLI) Michigan section meeting was held on May 24, 2016 and hosted by Consumers Energy in Jackson, Michigan. We had a great turnout for the meeting with 37 attendees participating in the day’s events. The meeting kicked-off with a warm welcome to all attendees. Bob Sawyer started the meeting by describing the different NCSLI membership levels and member benefits. He then followed up with a summary of events for the spring 2016 NCSLI Board of Directors Meeting from Santa Fe, New Mexico.

Our first presenter was Tim Osborne, who addressed the “Revision of ISO/IEC 17025 Status Update” which highlighted the proposed changes to ISO/IEC 17025. His topic brought up lots of questions and discussion in regards to the process and management requirement changes coming forth, if approved by the committee. One such change being the way a lab process is distributed, or shared, within an accredited lab. We had many other questions asked about how an accrediting body would conduct an audit of the new proposed changes to ISO/IEC 17025.
Dr. Jun Bautista followed with his presentation on “New Concepts of Measurements and Uncertainties in the Calibration of Newly Designed Climatic Chambers.” During the presentation, he gave a brief review of practical applications in the measurement and calibration of newly designed secondary standard “Portable Humidity Chambers” which he demonstrated and associated uncertainties as tested by his lab Masy BioServices.

Next was Meghan Shilling’s presentation on “Dimensional Metrology” which utilized interesting stories about her work in NIST laboratories alongside other NIST specialists. One such story was how they found new ways of redefining the standard artifacts which is continuously changing on a small scale.

Jason Watson and Jeff Guigue ended the meeting with their presentation on “Synchro Phasors & PMU’s.” The presentation gave a basic overview of the Phasor Measurement Units (PMU) functionality and describes the process used to develop and implement a traceable Type Acceptance process for commercial PMUs designed to comply with IEEE standard.

Door prizes were then given away as a thank you to attendees for participating and also as a reminder to fill out the Regional Meeting Survey hosted on the NCSLI website. A tour of the Consumers Energy calibration lab was given to those who were interested at the end of the meeting.

Overall, it was another successful section meeting for Michigan and we very much look forward to our next meeting. Thank you to all who attended and thank you to Consumers Energy and NCSLI International for all their support!
The NCSL International Northern Ohio/Western Pennsylvania section held its spring meeting on May 20, 2016 at FirstEnergy, BETA Lab facility. BETA Lab did a tremendous job in acting as host again. A networking breakfast sponsored by Trescal provided a good segue to an introduction of attendees, presenters and NCSL volunteers.

Our first presenter, Johnny Perkins of Trescal, discussed some effective communication techniques for evaluating test and measurement service suppliers. A departure from the science and mathematics centric presentations regional meetings typically produce, the presentation focused on the end user’s needs and addressing the technical requirements with a possible calibration or testing vendor.

Lloyd Baker of General Motors then provided an update on the happenings within NCSLI as an organization including upcoming events in the area, an overview of membership benefits, Workshop & Symposium details, and an explanation of the inspiring work the many volunteers throughout NCSLI do in order to keep the organization growing.

Paul Mathews of Mathews, Malner and Bailey, Inc. then presented a case study in finding the tip temperature of an electrode within a tungsten-halogen bulb when direct optical pyrometry is not possible. Complete with demonstration and supporting calculations, Paul was able to prove that by using a crow-bar circuit to interrupt the arc of the light, he could reliably ascertain the tip temperature as a function of time. Paul did an excellent job of engaging the audience in his work. It was a fantastic demonstration of metrology solving real problems.

A break for lunch was followed by a tour of FirstEnergy’s BETA Laboratory by Mike Yeager. A behind the scenes look...
into an operation with tremendous testing and calibration capabilities focused on serving the energy industry provided a good example of the testing rigors required to remain in compliance of the federal, state and local regulations governing energy providers.

Paul then addressed the meeting with a case study in using optical pyrometry for measurements and how to use statistical modeling to isolate and remove interference from the measurement results. Attendees were able to get hands-on with some of the measurement instrumentation used in the lighting industry and a palpable sense of fascination was reflected in the questions posed to Paul about the physical properties of light and the human eye's perception of light.

To conclude the meeting, NCSLI section coordinator, James Littlefield of Smither’s Group Inc., polled the attendees for improvements and what they would like to see at future section meetings as NCSLI members.

Once again, it was another successful section meeting for the Northern Ohio/Western Pennsylvania Region. Thank you to all the attendees, presenters, NCSLI International and our host, FirstEnergy for your support. Planning is underway for our next meeting in the fall of 2016. We hope to see you there!
A clear, blue Alabama spring sky welcomed attendees to the NCSL International Huntsville Section meeting on Thursday, April 28, 2016, at the Shelby Center for Science and Technology on the University of Alabama, Huntsville campus. The meeting began when section coordinator Beverly Garcia called the section to order and greeted attendees.

Attendees were welcomed to the meeting facility, which boast a beautiful view of NASA’s Saturn V rocket in the distance from the balcony. The U.S. Army is a strong supporter of our section here in Huntsville and Dr. Myra S. Gray, Executive Director of U.S. ARMY TMDE Activity (USATA), was gracious in providing a presentation describing their activities. Mr. Ehren Braun, Deputy Executive Director of USATA, delivered this session titled, “The USATA Enterprise.”

“Temperature Calibration Technology” was next on deck with a presentation provided by Scott Crone of AMETEK. Myles Friedland, physicist and president of Quantum Measurements, delivered “Dynamic Load Compensation in Dry-Block Calibrators.” Knowledge of potential pitfalls, such as temperature gradients, can help reduce or eliminate systematic errors in temperature measurements.
The morning continued with both fascination and inspiration as Ron Jewel of Southeastern US Industrial Magnetics, Inc. brought his programmable magnets in for a hands-on presentation. This was possibly one of the most entertaining presentations we have ever enjoyed! His captivating presentation aptly titled, “Programmable Magnets,” was indeed a crowd pleaser and not to mention scientifically brilliant!

Lunch was sponsored by: Additel, JM Test Systems, Southern Marketing Associates and Tegam.

Descriptions of laser measurements of adulterants in honey made for the “sweetest” presentation of the day in the post-lunch session provided by Dr. Carlton Farley, Alabama A&M University and delivered by Ken Garcia where the topic was “Detecting Food Adulterants and Explosives using Raman Spectroscopy.” As the ever growing interest in imported food adulteration continues, the Alabama A&M University Physics department has developed methods to identify substances that are being added to products, such as honey and olive oil, to increase volume. This is both a health concern and a misleading practice that is now being addressed. By using Raman spectroscopy combined with novel data analysis there is now a methodology in place to locate these adulterants.

Gregory Daspit of Southern Research Institute delivered a most informative presentation titled “Disappearing Filament Pyrometers” in which he carefully outlined the strengths and weakness of these devices. He also described techniques to maximize filament pyrometer performance.

As a prefect finish to the day, Michael Creney of Mitutoyo America delivered a presentation titled, “New Vision and Optical Technology” where he gave the attendees an inside look into the most current practices of dimensional metrology. This informative lecture provided insight into the sometimes cryptic language of dimensional drawings and was much appreciated by all.

It was another successful section meeting for Huntsville and we cannot wait for the next one! Thank you to our attendees, presenters, sponsors, NCSL International, and our host, the Shelby Center for Science and Technology!
The HPC40 Series is the world’s first combined pressure and mA loop calibrator to be fully temperature compensated from -20 to 50° C. You can count on the same accuracy whether measuring pressure, current, voltage, or temperature.

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The Tennessee section meeting was hosted by the Eastman Chemical Corporation headquarters in Kingsport, Tennessee on May 26, 2016. Members enjoyed presentations by the American Society for Quality (ASQ) and the International Society for Automation (ISA) of their technician certification programs. This provided a unique opportunity to compare the two programs side-by-side and learn about the unique strengths of each. Later in the morning, the Public Affairs Director provided an interesting overview of the history and current production capabilities and products produced by the huge Eastman Chemical facility in Kingsport as well as other Eastman facilities throughout the world. The afternoon sessions included an excellent presentation about factors effecting precision resistance measurements by Tim Stark, Guildline Instruments and an energetic discussion of the role of Reynolds number in the calibration of liquid flowmeters by Colorado Engineering Experiment Station, Inc. (CEESI), Terry Cousins.

To close out the meeting, our host conducted a facility tour of the 900-acre Eastman Chemical Kingsport facility. Attendees included representatives of educational institutions, automotive manufacturers, the Department of Energy, Department of Defense, metrology equipment manufacturers and, of course, Eastman Chemical engineers and technicians. Overall it was another stellar section meeting and we would like to thank all our attendees, presenters, Eastman Chemical and NCSL International for their continuous support.
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