



## MSC 2011 TUTORIAL WORKSHOPS

<http://www.msc-conf.com/msc/2011tutorials.html>

ASQ/CCT Training – (Full Day/Mon & Tues):

ASQ Certified Calibration Technician

Exam Refresher Workshop

Instructor: Dilip Shah

*Courtesy of E=mc<sup>3</sup> Solutions*

TUTORIAL T01 (Full Day):

Paperless Calibration Compliance For National and International Standards & Regulations

Instructor: Jay L. Bucher

*Courtesy of Bucherview Metrology Services*

TUTORIAL T11 (Full Day):

Measurement Uncertainty:

Fundamental Applications and Considerations

Instructor: Dilip Shah

*Courtesy of E=mc<sup>3</sup> Solutions*

Thursday, March 17th, 2011

2:00 PM~ 3:30 PM

### **Session A2: Measurement Optimization**

Effective Communication Between

Calibration Labs and Customers

Presenter: Heather Wade

*Courtesy of NSF International*

Friday, March 18th, 2011

8:30 AM ~ 10:00 AM

### **Session A4: ASQ**

ASQ Certification Exams -

Facts and Myths

Panel: Dilip Shah, Jay Bucher and Heather Wade

*Courtesy of ASQ/MQD*

2:00 PM ~ 3:30 PM

### **Session A6: Healthcare Metrology**

Debunking the Two Great Myths About Calibration:

Traceability to NIST & If You Cannot Adjust,  
You Cannot Calibrate!

Presenter: Jay Bucher

*Courtesy of Bucherview Metrology Services*

# The Standard

Vol 25, No. 1, March 2011

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## Letters to the Editor

The Standard welcomes letters from members and subscribers. Letters should clearly state whether the author is expressing opinion or presenting facts with supporting information. Commendation, encouragement, constructive critique, suggestions, and alternative approaches are accepted. If the content is more than 200 words, we may delete portions to hold that limit. We reserve the right to edit letters and papers.

## Information for Authors

The Standard publishes papers on the quality of measurements and the measurement of quality at all levels ranging from relatively simple tutorial material to state-of-the-art. Papers published in The Standard are not referred in the usual sense, except to ascertain that facts are correctly stated and to assure that opinion and fact are clearly distinguished one from another. The Editor reserves the right to edit any paper. Please single space after sentences and use Times New Roman, 12 pt font.

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## FROM THE DESK OF THE EDITOR/PUBLISHER

It is hard to believe that we are into another year, and therefore into another edition of [The Standard](#). MSC is only a couple of weeks away and so the front of this edition should come as no surprise for those that know the Measurement Quality Division is one of the supporters of this esteemed annual conference. This year, as in years past, a few of our members have stepped up and volunteered to not only support the tutorial workshops, pull booth duty, present papers and sit in on panel discussions, but also support our CCT efforts by giving of their time, talents and dedication in teaching a CCT refresher course and assisting in proctoring the CCT exam. Thank you Dilip Shah and Heather Wade for stepping up to the plate and helping to make the metrology community a better place to work and play.



On a very sad note, as some of you already know, David William Braudaway passed away this past December 25th, 2010. For the past few years, by coincidence, Dave manned a booth next to MQD's at MSC. I had the very distinct honor to pass many hours listening to some of his travails and anecdotes. Dave's sense of humor, and willingness to pass on knowledge and experience will be sorely missed in the metrology community. Godspeed, Dave - it was a pleasure knowing you. You shall not be soon forgotten.

If any of our readers happen to be attending MSC 2011 in Pasadena, please stop by our booth and say hello. For all the new CCTs out there, congratulations, and you should have your CCT challenge coins by now.

The Standard is published quarterly by the Measurement Quality Division of ASQ; deadlines are February 15, May 15, August 15 and November 15. Text information intended for publication can be sent via electronic mail as an attachment in MS Word format (Times New Roman, 11 pt). Use single spacing between sentences. Graphics/illustrations must be sent as a separate attachment, in jpg format. Photographs of MQD activities are always welcome. Publication of articles, product releases, advertisements or technical information does not imply endorsement by MQD or ASQ. While The Standard makes every effort to ensure the accuracy of articles, the publication disclaims responsibility for statements of fact or opinion made by the authors or other contributors. Material from The Standard may not be reproduced without permission of ASQ. Copyrights in the United States and all other countries are reserved. Website information: MQD's homepage can be found at <http://www.asq.org/measure>. © 2010 ASQ, MQD. All rights reserved.

## CHAIR'S CORNER

*By Jay L. Bucher*



In case you have not heard, the American Society for Quality (ASQ) has decided to change their fiscal year (July 1st through June 30th) to match the calendar year (January 1st through December 31st) starting on January 1st, 2012. All the sections and divisions within ASQ will be doing the same.

MQD had to decide if we wanted to have our current officers continue their term till the end of December, 2011 (in effect having a 2 1/2 year term this one time), or have the new group of officers take over on July 1st, 2011, and have a 2 1/2 term through December of 2013. We decided on the former. So our current slate of officers and chairs will continue in their positions until December 31st, 2011, and the next group will start their new term on January 1st, 2012. For your information, here are the current and future officers for the Measurement Quality Division:

*(July 1st, 2009 ~ December 31st, 2011)*

Chair	Jay L. Bucher
Chair-elect	Dilip Shah
Secretary	Heather Wade
Treasurer	Chris Grachanen

*(January 1st, 2012 ~ December 31st, 2013)*

Chair	Dilip Shah
Chair-elect	Heather Wade
Secretary	Jay L. Bucher
Treasurer	Chris Grachanen

Note: By unanimous vote of the board, Chris has been granted a waiver to fill the position of Treasurer for another two year term.

Our next quarterly meeting/teleconference call will occur on March 17th, from 6 pm - 7:30 PM Pacific Time (7~8:30 pm MT, 8~9:30 pm CT, and 9~10:30 pm ET). We try to conduct our meetings as efficiently as possible, so it should last less than an hour. If you happen to be attending this year's Measurement Science Conference (MSC) in Pasadena, CA, we will be meeting in one of their conference rooms. Please see their bulletin board for location, or stop by the MQD booth in the exhibitor's hall for the room number. If you wish to call in, please contact one of the officers for the call in number and pass code. All of their email addresses and phone numbers are listed on the last page of this newsletter.

I have had a couple of individuals volunteer to help the division in any way possible. I suggested they start by participating in our quarterly teleconference calls (or attend personally during either MSC, WCQI, or NCSL International's annual Workshop & Symposium).

We have a variety of opportunities to fit everyone's abilities, time and fiscal restraints, and desires to serve the measurement community. Some examples are: writing articles in sup-

*(Continued on page 4)*

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port of *Quality Progress Magazine's* bi-monthly column *Measure for Measure*; volunteer to hold one of the many positions within the division which include officers, chairs, liaisons and booth support at the two annual conferences we support (MSC and NCSLI) and also during WCQI. The easiest way to start is simply by joining the teleconference calls; sending one of the officers an email stating you're interested in volunteering; or stopping by our booth at one of the conferences and letting us know of your interest. It is easy, painless, and very rewarding.

Allow me to switch hats for a moment and talk to you as the CCT program chair. We completed our 5 year review of the CCT exam program. The final part was getting volunteers who had their CCTs, but had not participated in any previous workshops to gather in Milwaukee, Wisconsin, for the Cut Score Workshop the first weekend of December (it was also the first time that the newly revised CCT exam would be given world wide). They were placed in the capable hands of ASQ's Michael Byrnes, their Senior Program and Training Administrator for the certification program. The following individuals gave very generously of their time and talent to complete the final part of the revised exam process, and they have my gratitude. The volunteers were: Juan Rodriguez, Martin Zavala, Arlyn Nieto, David Jinks, Frances Aponte, Jim Austin, Brett Currier, Stan Tcheshie, Greg Boyd and Dave Rossow. They gathered for a picture which Arlyn was gracious enough to forward to me. Again, a huge thank you to all for their help in making the CCT one of the most sought after certifications from ASQ.



## MQD TREASURER'S REPORT

**February 2011**

*By Christopher L. Grachanen*



As per 31 January 2011 Bank Statement MQD continues to have a strong balance sheet (Statement of Financial Position) with over \$171,000.00 combined checking and saving account balances.

Commercial Checking Account Ending Leger Balance as of 31 Jan 2011:	\$91,171.54
Money Market Saving Account Ending Balance as of 31 Jan 2011:	\$79,924.36
Membership Revenue for seven months ending 31 Jan 2011:	\$12,681.00
Investment Income for seven months ending 31 Jan 2011:	\$117.00
Royalties Income for the period from Jan to Jun 2010:	\$998.00
Total revenues for all sources for seven months ending 31 Jan 2011:	\$13,797.00
Budgeted MQD Expenses for seven months ending 31 Jan 2011:	\$20,429.00

NOTE: MQD budgeted expenses for seven months ending 31 Jan 2011 include \$10,000.00 matching funds challenge for NCSLI & MQD Multifunction DVD Outreach Project (Phase 2).

## PASSING THE TORCH

*Christopher L. Grachanen*



As we begin the year 2011 we saw the passing of the torch of one of the international measurement community's most venerable publications; *Cal Lab Magazine*, *The International Journal of Metrology*. Cal Lab Solutions, a metrology based software engineering and consulting company dedicated to providing customers with customized off-the-shelf software solutions, acquired Cal Lab Magazine from owner Carol Singer in Jan 2011.

*Cal Lab Magazine* was founded in 1994 by Charles Masi, a former editor at Test and Measurement World. At the time there were only a handful of test and measurement magazines that would cover calibration products. Only rarely would one of these publications devote an article to calibration. Mr. Masi launched Cal Lab with investment funding. By the end of 1994 (3 issues) Mr. Masi was not able to attract enough advertising revenue to continue publishing. Carol Singer attained ownership and started publishing with the March-April 1995 issue after serving as editor for the January-February 1995 issue and introducing the magazine at the Measurement Science Conference in January 1995.

For 16 years Carol Singer was at the guiding helm of *Cal Lab Magazine* where she showcased articles and commentary from the Who's Who of the international measurement community focusing on topics of particular interest to calibration practitioners. In addition Carol Singer oversaw the *Cal Lab Magazine* website which provided the international measurement community with industry news updates, events calendar, job postings and freeware software. I was happy to learn that Carol Singer has generously agreed to remain on the *Cal Lab Magazine's* Board of Advisers and fill an additional role as Contributing Editor for the next 3 years.

Michael Schwartz, owner of Cal Lab Solutions, is committed to carrying on the proud tradition of *Cal Lab Magazine* and is enthusiastic about incorporating various innovations to provide even more benefits to the international measurement community. Of particular note is the DVD, "16 Years of *Cal Lab Magazine*" (1995-2010), in PDF format available from the newly renovated *Cal Lab Magazine* website at:

<http://callabmag.com/WordPress/?duka=16-years-of-cal-lab-magazine>

As a longtime subscriber and occasional contributor to *Cal Lab Magazine*, I appreciate Carol Singer's stewardship all these years and I am excited about the direction Michael Schwartz would like to take *Cal Lab Magazine* in the future.

Follow this link to Cal Lab Magazine's new website: <http://callabmag.com/WordPress/>

## THE LEARNING CURVE

By Phil Painchaud



This is the sixty-fifth in a contiguous series of quarterly columns, primarily charted by our original Editor-in-Chief, as a vehicle for the exploration of the general subject of **Metrology Education**, and as a platform for the readers of this column to express their views on that subject. We now are into our nineteenth year of attempting to mount this platform and to expound their thoughts on the subject of METROLOGY EDUCATION. The response has ranged from underwhelming to non-existent. This apathy or unconcern by the readers has required this author a great deal of latitude in choosing alternate theses for some columns and for the continuation of his cynistic writing style. Fortunately this time we do have some current information concerning Metrology Education. So, following our long established custom, this Column will again be in the form of an open Letter to the Editor. .

Dear Boss:

Another quarter has rolled around and you as usual have reminded me of a deadline. Frankly I am not in very good shape to meet a deadline in my usual style. I have been bedridden with the intestinal flu for the past week and today is the first day that I have been out of bed most of the day (since noon at least).

I did have several items to write about, but they have been lost in the enormous pile of paper that has accumulated since I have been down. The most important (to me and this column) was a paper that our compatriot Chris wrote on the need for professional Metrologists (not Calibrators or Technicians), the same theme that I have been harping on for the last eighteen years! My embarrassing dilemma is that I can't remember who sent it to me (I do remember that it was a non-metrology type), they gave me no hint as to what publication they had retrieved it, and when. I did make a hard copy but that got lost in the pile that I have previously mentioned. So we shall concentrate on the two other items that I have selected.

As you all should know by now I am a martinet on the subject of collateral reading, i.e. reading on subjects related to Metrology but not necessarily in the mainline of the studies of the moment. Part of the cause for that is there not very many books published on Metrology fundamentals. Before you try to shout me down, I will voluntarily admit that there are many handbooks and texts available, some very excellent, on Calibration and other aspects of Metrology Technology and practice. However there are few fundamental texts, but most of them are well over fifty years old, and while they are still excellent references and still should be in every Professional Metrologist's personal library, they are not the texts that a neophyte Metrologist should be studying during his beginning level studies.

I had always thought that I have kept a sharp eye out for new publications in our field of interest, but shame of me, *mea culpa!* I have recently discovered and acquired for my own library a monumental text entitled:

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## FOUNDATIONS OF MEASUREMENT

It is in three volumes authored by:

David H. Krantz, Columbia University  
 R. Duncan Luce, University of California, Irvine  
 Patrick Suppes, Stanford University  
 Amos Tversky, No affiliation given.

This magnificent work was first published and copywrited in 1971 and updated and copywrited again in 1989, and again in 1990. By using their ISBN (International Standard Book Number) you should be able to purchase them from any technical book store. I bought mine from Dover Publications, in Mineola, NY.

The ISBN numbers are:

Volume I: 0-480-45314-6  
 Volume II. 0-480-45314-4  
 Volume III. 0-480-45314-2

A complete review as this publication truly deserves (1433 pages of text and index plus dozens of pages of bibliography of suggested collateral reading) is obviously too monstrous to attempt in this column. So instead we shall list selected paragraph headings from each of the volumes

Volume I: —Construction of Numerical Functions  
 —Extensive Measurement  
 —Difference Measurement  
 —Probability Representations  
 —Measurement Inequalities  
 —Dimensional Analysis and Numerical Laws

Volume II. —Geometrical Representations  
 —Proximity Measurements  
 —Color and Force Measurements  
 —Vector Representations  
 —Metric Representations  
 —Proximity Measurements  
 —Multidimensional Representations  
 —Tristimulus Colorimetry  
 —Force Measurements and Dynamical Theory

Volume III. —Unit Representations  
 —Concatenation Structures and Their Properties  
 —Scale Types

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- Problems in Understanding Scale Types
- Why Do Scientists and Mathematicians Axiomatize?
- Elementary Languages
- Definability and Interpretability
- Methods of Defining Meaningful Relations
- Meaningfulness and Statistics
- Dimensional Invariance
- Fundamental versus Index Measurement

Remember that these are only a selected few chapter and paragraph titles selected at random from at least ten times as many. I believe that this is a text that should be mastered by any true Metrology student by the end of their second year in a formal academic curriculum. I am sure that had I discovered it earlier that it would have been one of Dr. Watson's mandatory texts in his California State University—Dominguez Hills program.

If your ambitions are at a lower level, i.e. becoming a Calibrator, or other type of Metrological Technician (a worthy accomplishment in itself) the level of education available from this text would not be necessary. On the other hand, should you be aiming for the apogean apex of our profession, the truly Professional Metrologist, by all means acquire that text and master it.

Any technology practioner who has been around as long as I have is bound to have roots in a number of professional organizations. I am no different; in my early college days I joined the American Chemical Society later, after WW II I dropped it after my chemical interests waned in favor of Radio Engineering.

In 1947 I joined the Institute of Radio Engineers (IRE) which was originally formed in 1912. Later on the strong personal recommendation of Dr. Forest Harris (the author of the "bible" on Electrical Measurements) I joined the American Institute of Electrical Engineers (AIEE) which had its roots back in 1884. In 1962 the two organizations merged and became what is today the Institute of Electrical and Electronics Engineers (IEEE), the largest Professional Society in the world.

Shortly after the merger the hierarchy recognize the need for a special interest group to service the needs of those members interested in the measurement sciences as pertained to electrical measurements, today that group is known as THE IEEE INSTRUMENTATION AND MEASUREMENT SOCIETY (I&MS). I have been a member since its inception. It too publishes a periodic bimonthly journal, in the current issue (VOL 14, #1), Kim Fowler published a short article entitled **The Challenge of Measurement Science.** His message is most surely apropos to our aims in our Measurement Quality Division. I should like to quote a few lines from it here:

*—“It seems to me that many people do not appreciate the challenge and necessity for measurement and instrumentation. Certainly the general public does not know what is important in sustaining measurements or why it is important to do so. Even scientists and engineers seem to be hazy as to the issues surrounding measurement and instrumentation. A recent white paper by Derek MacLachlan opens with this comment “Accurate measurements are central to virtually every scientific and engineering discipline, but all too often measurement science gets little attention in the undergraduate curriculum [at least this is true in the*

*(Continued on page 10)*

(Continued from page 9)

***United States]. Even those who had received a thorough grounding in measurement fundamentals as undergraduates [have] forgotten some of the details”—***

Mr. Fowler goes on in his article hypothesizing many factors that he believes may have helped cause this situation in whole or in part. I do not challenge any of them, but offer my opinion that the prime cause is **within the educational institutions themselves**. Many that I have audited appeared to have designed and adopted curricula aimed at bring the subject matter down to the level of the student rather than elevating the student to the level necessary for operating in the real world as practioners in Metrology (or whichever technical field they had chosen to be in).

Often when I was able to question the Administration of these institutions concerning these practices, frequent answers were: **“They are not prepared well enough when they arrive here. We cannot turn them down as we need their money. We don’t want them to become frightened and leave in midterm.”** Or as I heard from one state institution: **“We have to get them through as rapidly as possible so that we do not have to build additional facilities. The caliber of students we are getting require five to six years to get through a four year curriculum!”**

That is enough for this issue, is it not Boss? Meanwhile if you want to argue with me I am at the same old stand.

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## Presidents' Race to Retain

Results: July 1 – December 31, 2010

**Congratulations to the following member units for implementing and reporting identified successful practices and achieving the noted % increase in member retention for the time period:**

### **Blue Ribbon (4% or greater improvement)**

North Florida/South Georgia Section  
 Greater Danbury Section  
 Heart of Illinois Section  
 Toledo Section  
 Service Quality Division  
**Measurement Quality Division**  
 Northeast Tennessee Section  
 Quality Management Division  
 Education Division  
 Statistics Division  
 East Central Indiana Section  
 Customer-Supplier Division

### **Red Ribbon (3-3.9% improvement)**

Central Texas Section  
 Biomedical Division  
 Lean Enterprise Division  
 Michiana Section

### **White Ribbon (2-2.9% improvement)**

Cleveland Section  
 Greater Fort Worth Section  
 Mobile Section  
 Toronto Section

A total of forty-eight member units participated, many of whom are seeing improvement in retention compared to last year. Thank you to all for your efforts!

Congratulations to Elias Monreal for his election as ASQ Section Affairs Council (SAC) Regional Director, Region 7. Thanks for serving and congratulations on your election!

### **Regional Director Election Results**

Congratulations to the following individuals, who as a result of being the only nominees in their regions, have been declared elected for the term January 1, 2012 – December 31, 2013. We thank them for their willingness to serve and welcome them to the Section Affairs Council.

- Region 7 – Elias Monreal

Editor's note: Elias is MQD's Membership Chair, and our Voice of the Customer Representative. Congratulations from the officers and chairs of MQD.



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# MEASUREMENT SCIENCE CONFERENCE 2011 OVERVIEW



**METROLOGY AND  
QUALITY THROUGH  
EDUCATION**

## MONDAY, MARCH 14, 2011

8:00 AM – 5:00 PM **NIST Seminars** – Day One of Two-day Technical Seminars Presented by NIST – **Hilton Hotel**  
 8:00 AM – 5:00 PM **ASQ Training** – **Hilton Hotel**

## TUESDAY, MARCH 15, 2011

8:00 AM – 5:00 PM **NIST Seminars** – Day Two of Two-day Technical Seminars Presented by NIST – **Hilton Hotel**  
 8:00 AM – 5:00 PM **ASQ Training** – **Hilton Hotel**  
 8:00 AM – 5:00 PM **Tutorial Workshops** – All Full Day – **Conference Center**

## WEDNESDAY, MARCH 16, 2011

8:00 AM – 5:00 PM **NIST Seminars** – Two Hands On Seminars Presented by NIST – **Hilton Hotel**  
 8:00 AM – 5:00 PM **Tutorial Workshops** – Full Day and ½ Day Workshops – **Conference Center**  
 5:30 PM – 8:30 PM **Exhibit Hall Opening / Reception / Raffle** – **Convention Center Exhibit Hall**

## THURSDAY, MARCH 17, 2011

9:00 AM – 10:00 AM **General Session / Keynote Speaker Professor Dr. Mladen Borsic** – **Ballroom D/E Convention Center**  
 10:00 AM – 5:00 PM **Exhibit Hall Open**  
 10:00 AM – 10:45 AM **Morning Break / Exhibit Hall**

Track/ Conv Ctr	A BALLROOM A	B BALLROOM B	C BALLROOM C	F BALLROOM F	G BALLROOM G
10:45 AM	<b>A1</b> RF/Electrical	<b>B1</b> Equipment Specifications	<b>C1</b> Flow I	<b>F1</b> Youth At MSC	<b>G1</b> Advances in Temperature
12:15 PM – 1:50 PM	<b>Luncheon / Speaker Professor Dr. Paul De Bièvre / Woodington Award</b> – <b>Ballroom D/E Convention Center</b>				
2:00 PM	<b>A2</b> Measurement Optimization	<b>B2</b> Metrology R&D I	<b>C2</b> Flow II	<b>F2</b> Metrology for the Next Gen	<b>G2</b> X-Ray & Blackbodies
3:30 PM – 4:00 PM	<b>Afternoon Break / Exhibit Hall</b>				
4:00 PM	<b>A3</b> Z540	<b>B3</b> Metrology R&D II	<b>C3</b> Flow III	<b>F3</b> STEP Then & Now	<b>G3</b> Calibration Requirements
6:30 PM – 9:30 PM	<b>President's Reception at 300 Pasadena / Raffle</b>				

## FRIDAY, MARCH 18, 2011

8:00 AM – 12:30 PM	<b>Exhibit Hall Open</b> – <b>Convention Center</b>				
8:30 AM <b>Conference Center</b>	<b>HOW-01</b> Introduction to RF/Microwave Power Measurements Workshop	<b>HOW-02</b> Practical Temperature Measurement Workshop	<b>HOW-03</b> Introduction to Optical Alignment Metrology Workshop	<b>HOW-04</b> Introduction to Dimensional Metrology Workshop	
8:30 AM	<b>A4</b> ASQ	<b>B4</b> CMM	<b>C4</b> Statistics	<b>F4</b> Future Workforce	<b>G3</b> Pressure
10:00 AM – 10:30 AM	<b>Morning Break / Exhibit Hall</b> – <b>Convention Center</b>				
10:45 AM	<b>A5</b> Quality	<b>B5</b> Knowledge Management	<b>C5</b> Statistics II	<b>F5</b> Education & Training	<b>G5 – Panel</b> Test Equipment Management (TEM I)
12:00 PM – 2:00 PM	<b>Luncheon / Speaker Robert Bryant International Motivational Speaker / Scholarship Awards</b> – <b>Ballroom D/E Convention Ctr</b>				
2:00 PM	<b>A6</b> Healthcare Metrology	<b>B6</b> AMA Airspeed, Mass, & Acceleration	<b>C6</b> RP-5 Panel	<b>F6</b> Future Metrologists	<b>G6</b> Test Equipment Management (TEM II)
4:00 PM – 5:00 PM	<b>Door Prizes</b> – <b>Ballroom D/E Convention Center</b>				



NCSL INTERNATIONAL



# 50<sup>th</sup>

## ANNIVERSARY

SERVING THE WORLD OF MEASUREMENT

1961



NCSL was formally organized as the National Conference of Standards Laboratories.

NCSLI President William A. Simmons appeared before a Department of Commerce hearing on improving U.S. participation in international standards activities.



1990

2006



NCSLI launched the new journal MEASURE to the membership.

2000



The National Conference of Standards Laboratories changes its name to "NCSL International."

### 50 YEARS: REFLECTING ON THE PAST - LOOKING TO THE FUTURE

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**WORKSHOP & SYMPOSIUM: AUGUST 21 - 25, 2011**

Gaylord National Convention Center, National Harbor, MD