IMPLEMENTING CHANGE . . .

INITIATIVES

As I continue to discover, the word "initiative" is used in more ways than I once imagined. During the last year, ten statements were developed as a result of workshops, and other activities, by over 60 member delegates, that we called "Key NCSL initiatives for 1989". These initiatives formed the foundation for the NCSL 1989-1993 Long Range Plan, which was subsequently adopted by the Board during its January 1989 meeting. This plan converted the initiatives into near-term actions and budget requirements as well as longer term objectives for each NCSL office and committee.

As the Board, committee members and many others worked hard on developing the initiatives and the resulting plan, the Board's adoption of the plan reaffirmed the mutual commitment to its implementation and the goal to improve the metrology area for the betterment of our member organizations and nations.

True to tradition, implementation of the plan will primarily be through voluntary action and teamwork by results-oriented members and others committed to managing our future. (If you're motivated and interested, write or call Ken or Joan at the NCSL Headquarters for a copy of the NCSL 1989-1993 Long Range Plan).

During 1988 another set of initiatives was being formulated within the National Institute of Standards and Technology (NIST) to adjust its direction and budget to better meet the metrology needs of the United States. These initiatives emerged in publication about the same time as NCSL's initiatives - NIST's were in the form of part of the President's budget proposal to Congress for fiscal year 1990.

While the overall 1990 proposal is lower that the 1989 appropriation, seven programs were proposed for increases totalling about $15M and six were proposed for decreases of about $19M. A quick look at the programs proposed for an increase shows significant emphasis on materials, processes and computers, with some mention of measurement services in the lightwave area. On the decrease side, a major reduction is proposed for the new technology transfer centers and fire/building research, however, none for measurement services. Comparing these proposed changes, emphasis continues on the technology side of the business with a token mention of standards and services.

Deemphasis of the technology transfer centers is curious not only because their continued establishment was reflective of last years' enabling legislation, but they should also provide a vehicle to transfer the results of the high technology and measurement service programs to local areas and our smaller business.

Like the fire and building research program, Congress will probably put these centers back into the budget and take cutting action elsewhere. Defenses for measurement standards and services will be mounted but the negotiation position is weak - not much is in the proposal to begin with (another curious situation). Measurement standards and services which provides the scientific basis for technology, and contributes significantly to the quality of products and competitiveness in the world market may once again be in jeopardy as the initiative game continues.

(Continued on page 30)
EDITOR'S MESSAGE:

WILLIAM BRENANT - CHUCK GARDNER

It's statistical, of course. One after another of our friends and associates die, slowly at first, then accelerating. Maybe it's easier to accept when you're in late retirement. Not so easy when an accident happens or a serious illness gives us some advance notice. But active, lively people like Bill & Chuck just shouldn't be included in this grim, celestial crapshoot.

Bill was a fine Metrology Manager, an interesting man and a good friend, albeit at a distance. And I had just worked with Chuck on the Directory. But as with most of our NCSL dealings, we meet each other once a year, but the pictures go by each quarter and we feel we are all connected by our work. Or you pick up the phone to check something out, and always get a friendly NCSL voice.

It's tough to absorb this terrible news. To all of Bill's & Chuck's family and friends, be assured that their lives and contributions made a difference to those of us who worked with them.

AND ALSO RETIREMENTS

It was also quite a surprise to see the news that three stalwarts of NCSL and MSC were retiring en masse from Rockwell. George Rice, Roland Yavken and Bob Couture were honored in a ceremony just before the MSC recognizing their combined contributions. It was noted that they had accumulated more than 95 years of service at Rockwell.

George was not only a fine NCSL president, but also had a lot to do with the early strategic approach to NCSL's speaking out at U.S. Congressional budget hearings. Roland was always active on committees and lately did a terrific job as Treasurer. (I don't believe he was as tough (some would say cheap) as Paul Hunter or Bob DeLapp.) Bob Couture was Mr. Doorprize at MSC for years. Now there is something to be remembered for. But Bob was always active in PMA and helping with NCSL things too. Thanks for the efforts.

THANKS CHARLIE SIDES

We also need to give a hearty round of applause to Charlie Sides of Boeing. He's just leaving the Equipment Management Forum which he was instrumental in founding several years ago. By sheer force of personality, Charlie brought the EMF to a really effective group with high attendance and valuable contributions in the sector of big-time inventory management. Charlie, we will miss you, and thanks for your great efforts.
DATE: April 1989

An Open Memo to Member Delegates, Colleagues and Friends

It gives me a great deal of pleasure to remind all of you of our 1989 National Conference in Denver July 9-13. Please mark your calendars now, and begin your travel plans soon to get the best airfares.

There are many good reasons for you to participate in the 1989 Conference. To begin with, the NCSL Conference has a well deserved and hard earned reputation as being the premier event of its kind. We earned that reputation by blending topical subjects, innovation, education, and conviviality into a valuable showcase which is long remembered after the last visitor departs.

The addition of vendor displays has been extremely successful. It has provided, under one roof, a unique collection of technology and information which has proven invaluable to our attendees. The vendor exposition portion of the conference alone is reason enough to attend... and there is considerably more.

The technical papers to be delivered at this year’s conference cover a broad range of extremely interesting and timely subjects. Certainly we will cover areas of electrical and electronic testing and standards, those disciplines formed the roots of our organization and continue to play a major role. We will also cover diverse disciplines such as medical, petrochemical and others. You will be exposed to test and measurement technologies and how they affect engineering, quality assurance and production. We will discuss changes in the volt, expose various views on traceability and review practical calibration procedures.

You will have ample opportunities to visit NIST without missing any other conference activities. The tours are scheduled to follow the close of the conference on Thursday, July 13th.

Again, let me take this opportunity to personally invite you to attend, to learn, to be entertained, to meet your fellow professionals as well as representatives from NIST and to grow with us. Watch your mail for registration information, and encourage your colleagues to join us.

I look forward to seeing you in Denver July 9-13, 1989.

Val Gersbach, Vice President & Conference, Director
Bill Brenant, Acting Coordinator of Region 2 and newly elected NCSL Director for Region’s 3 & 4, died at his home in Rego Park, NY on February 22, 1989. Bill had survived an initial heart attack on January 31, 1989 while attending the NCSL Board of Directors First Quarter meeting in Tucson, Arizona. He spent 8 days in the Intensive Care Unit of St. Joseph’s Hospital and on February 12th was released for travel back to his home in New York.

Bill was born January 3, 1938, in New York City and is survived by his father, Walter of New York as well as an older brother, Norman of Saratoga, NY and a younger sister, Sandra Brim, of Queens, NY.

After graduating from High School, Bill served his country in the United States Air Force. His military assignments took him all over the world where he served with distinction for 20 years before retiring with the highest enlisted rank. During his enlistment, Bill continued his formal education by attending Sophia University in Tokyo, Japan as well as the University of Colorado. He was a student of the first group to attend the PMEL School at Lowery AFB, Colorado. Bill also attended a special training exchange program at the NBS facility in Boulder, Colorado and received advanced Metrology training by the Air Force in Heath, Ohio. Other significant military assignments included being a member of a U.S. Air Force team established to set up the first PMEL Lab for the Canadian Air Force and service on the United Nations Scientific Advisory Commission for Under-developed Countries.

As with his military career, Bill’s primary field of expertise with the Loral Electronics Corporation of Bronx, NY was electronics and metrology. Until his death, he was employed there in various engineering and management positions for 16 years. According to his Supervisor at Loral - Mr. Frank Barbera - Bill was considered an extremely valuable employee who was deeply committed to his company. He held a reputation as a caring, considerate, people-oriented employee who always stood ready to help others with personal as well as business problems. Bill was heavily involved in the New York City Headstart Program and served as a member on the Board of Directors of Headstart of Queens, New York.

In addition to his many years of service to the NCSL organization, Bill was a member of the ASQC and the American Management Association. He was a Past President of Toastmasters International. Mr. Brenant is listed in the 1983-84 Eastern Region Publication of “Who’s Who in the United States”.

Many of us in the NCSL community will remember Bill with his camera and lenses hanging from around his neck enjoying one of his personal hobbies. Another, perhaps less known, interest of Bill’s was the art of Gourmet Cooking, having received a certificate for attending a well known Chef’s School in Paris, France. He was also active in a New York organization, “Men Who Cook”.

Mr. William Brenant was an active member of the human race for 51 years. His many accomplishments and contributions to his country, his community, his company as well as the National Conference of Standards Laboratories will not soon be forgotten. Ruth Snorgrass, a close friend and long-time companion, when asked to comment about Bill’s personal side offered that one of the proudest achievements that he had shared with her was his recent election to the Board of Directors of the NCSL. It is indeed unfortunate that Bill was able to contribute his energy and wisdom to the Board for only such a short period. The measurement community and the NCSL organization will truly miss his knowledge and leadership qualities.

Oliver Wendell Holmes is credited with saying, “A man must become part of the action and the passions of his time, lest he be judged not to have lived”. Those who knew Bill Brenant as a friend, a fellow human, or as a colleague would most assuredly agree that he had indeed been part of the action and passions of his time. We may all miss Bill - But, we will also remember him -

Pete England

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CHUCK GARDNER

With deep regret, we note the untimely passing of Richard (Chuck) Gardner on Feb. 24, 1989. Chuck worked in Tom Knowles group at ITT Avionics on Clifton, NJ. He was a highly respected contributor to NCSL, who served on the Publications committee for the past four years. Our condolences to his wife, Evelyn, and his many friends and associates.
## NCSL Budget for Calendar Year 1989

(January 1, 1989 thru December 31, 1989)

### Income Accounts

<table>
<thead>
<tr>
<th>Description</th>
<th>Authorized Amount</th>
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### Expense Accounts

#### Committee Accounts

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### Operations Accounts

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-5-
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**CONFERENCE ACCOUNTS**

| Registration Fees | V.P. Conference Management | 175,500.00 | 141,144.00 |
| Exhbits Fees      | V.P. Conference Management | 78,900.00  | 60,800.00  |
| Guest Program Fees| V.P. Conference Management | 1,500.00   | 96.00      |
| Other Income      | V.P. Conference Management | 1,800.00   | 6,005.00   |
| Total - Income Accounts | | 257,700.00 | 208,045.00 |
| Audio-Visual Support | V.P. Conference Management | 4,775.00 | 6,037.00 |
| Entertainment      | V.P. Conference Management | 4,000.00  | 4,500.00  |
| Publicity          | V.P. Conference Management | 27,200.00 | 11,524.00 |
| Registration Help  | V.P. Conference Management | 700.00    | 1,218.00  |
| Proceedings        | V.P. Conference Management | 8,000.00  | 7,224.00  |
| Transportation     | V.P. Conference Management | 2,000.00  | 4,088.00  |
| Speakers' Expenses | V.P. Conference Management | 5,800.00  | 13,933.00 |
| Best Paper Awards  | V.P. Conference Management | 500.00    | 500.00     |
| Door Prizes        | V.P. Conference Management | 1,000.00  | 1,196.00  |
| Registration Expenses | V.P. Conference Management | 1,000.00 | 2,258.00 |
| Exhibits Expenses  | V.P. Conference Management | 9,310.00  | 3,241.00  |
| Photographer       | V.P. Conference Management | 1,500.00  | 1,265.00  |
| Other Fixed Expenses | V.P. Conference Management | 200.00   | 1,163.00  |
| Breaks and Lunches | V.P. Conference Management | 61,990.00 | 61,229.00 |
| Banquet            | V.P. Conference Management | 32,468.00 | 28,042.00 |
| Reception          | V.P. Conference Management | 19,800.00 | 13,620.00 |
| Other Variable Expenses | V.P. Conference Management | 0.00     | 0.00      |
| Total - Expense Accounts | | 180,333.00 | 161,058.00 |
| Conference Balance | | 77,367.00  | 46,987.00  |
| Grand Balance      | | 1,462.00   | -727.00   |
This column is in response to your inquiries concerning the control of subcontractor calibration (para 5.11) of MIL-STD-45662A and, in particular, the last sentence which reads “Results of Government inspections or audits conducted within the last 12 months may be used in determining subcontractor compliance.”

The intent of para 5.11 is to define the contractor’s responsibility for assuring that the subcontractor’s calibration system conforms to the MIL-STD, at least to the degree necessary to satisfy contract compliance, and to minimize and or limit the redundancy in audits conducted at the subcontractor level.

It should also be pointed out that similar language appears at the end of para 4.2. This column will address both of these paragraphs and attempt to explain their similarities, differences, and DOD intent.

The intent of para 4.2 is to encourage better interagency contract administration and audit services. Basically, this is the Government looking at the Government and accepting each others audit results. In practice, “multiple reviews, inspections, and examinations of a contractor or subcontractor by several agencies involving the same practices, operations, or functions shall be eliminated to the maximum extent practicable through the use of cross servicing arrangements.”

In para 5.11 the application of using previous audit results is more subtle. It has been reported to the DOD that there are multiple and redundant audits conducted at the subcontractor level and that these audits are for the specific purpose of determining subcontractor compliance to the MIL-STD. There is a consensus within DOD that there are alternative methods for achieving the same quality results that do not necessarily expose the DOD to undue or additional risks.

It is important to understand that government audits conducted at the subcontractor level are for the convenience of the Government only and not intended to supplant the contractor’s responsibility or liability for controlling the subcontractor. Of equal importance is to understand that it is not the intention of DOD to exempt the contractor from conducting audits and controlling the subcontractor, or to exempt the contractor from additional audits within the 12 month period. It was also not intended to totally revolutionize the process. However, it is an attempt to introduce language that would allow the system to change (e.g., a vehicle in which to recognize those subcontractors who have established a long history of quality products and services to the Government and lessen our involvement in their operations). Please be advised that acceptance or rejection of objective evidence is the prerogative of the Government representative.

It is important to note that this requirement is as new to the Government representative as it is to the private sector and that only through time, understanding, and cooperation can we hope to collectively achieve success.

David J. Mednick
Army Agent for MIL-STD-45662A
Office for TMDE Management
ISA TRAINING COURSES ANNOUNCED

May 1-4, 1989

T105: Orientation To Process Control
Dates: May 1, 1989
Hours: 8:30 a.m.-5:00 p.m.
Instructor: M.J. Sergesketter

T110: Instrumentation & Control Fundamentals
Dates: May 2-4, 1989
Hours: 8:30 a.m.-4:00 p.m.
Instructor: M.J. Sergesketter

T220: Industrial Pressure and Level Measurement
Dates: May 3-4, 1989
Hours: 8:30 a.m.-4:00 p.m.
Instructor: J.F. Hausman

T255: Process Sampling For Online Analysis
Dates: May 1-2, 1989
Hours: 8:30 a.m.-4:00 p.m.
Instructor: Tony Waters

T260: Process Gas Chromatography
Dates: May 3-4, 1989
Hours: 8:30 a.m.-4:00 p.m.
Instructor: Tony Waters

T310: Fundamentals Of Industrial Data Communication
Dates: May 1-3, 1989
Hours: 8:30 a.m.-4:00 p.m.
Instructor: Lawrence M. Thompson

T313: Networks For Real Time Process Control
Date: May 1, 1989
Hours: 8:30 a.m.-5:00 p.m.
Instructor: Daniel T. Miklovic

T315: Broadband MAP Networks: Design And Installation
Dates: May 3-4, 1989
Hours: 8:30 a.m.-4:00 p.m.

T332: Personal Computers For Industrial Data Acquisition And Control
Date: May 4, 1989
Hours: 8:30 a.m.-12:30 p.m.
Instructor: Lawrence M. Thompson

T417: Applications of Single Station Controllers
Date: May 1, 1989
Hours: 8:30 a.m.-5:00 p.m.
Instructor: Harold L. Wade, Ph.D

T420: Fundamentals of Programmable Controllers
Dates: May 1-2, 1989
Hours: 8:30 a.m.-4:00 p.m.
Instructor: Conrad DeGrace

T425: Programmable Controller Applications
Dates: May 3-4, 1989
Hours: 8:30 a.m.-4:00 p.m.
Instructor: Conrad DeGrace

Membership Credit For Non-Members

Non-member course registrations include a $35 credit toward a one-year ISA membership. Membership in ISA will become effective upon completion of the course and after completing and returning a membership application form to ISA's Membership Division with a $15 (U.S.) check or money order for the balance of payment on one-year's membership. Persons registering for a course as a part of a group registration discount, or any other discounted rate, will not receive the $35 credit towards membership.

Registration Deadline

Advance registration deadline is April 17 for the West Coast courses. Acceptances after that time are based on space availability. To register after the deadline, call Jane Lee or Lynne AmRhein at the ISA Training Center in North Carolina, (919) 832-5599, Telex 802-540, or FAX (919) 832-0237, to find out if there are openings. Registration must be confirmed with the ISA training Center before the course.

INTRODUCTORY TRAINING FOR METROLOGY & CALIBRATION

1989 Course Schedule

17-21 April 1989 San Diego, CA
2-6 October 1989 Orlando, FL

Introduction

Metrology, \(\text{'me-trål-ə-je}'\), the science of measurement, is a process involving a succession of logical steps in which units of any quantity are expressed and transmitted through the use of measuring apparatus.

Calibration, \(\text{'kal-α-brə-shən}'\), the science of standardizing measuring apparatus, the process of determining the deviation of the expressed quantity from that of a measurement standard to ascertain the required correction factors.
Who Should Attend

This training course will benefit prospective technicians as well as technicians currently performing measurements; quality control personnel and managers involved with calibration and/or the use of test and measuring equipment.

Tuition

The tuition for each five-day training course is $945 per person. This includes all course materials, a comprehensive notebook and refreshments during class hours. It does not include meals or hotel accommodations.

DALFI, Inc. - Jom Shepard
9888 Carroll Center Road, Suite 100
San Diego, California 92126
(619) 578-9500

MEASUREMENT UNCERTAINTY - MEASUREMENT ASSURANCE COURSE DATE ANNOUNCEMENT

3-9 June 1989, Ottawa, Ontario, Canada.

A five-day, thirty-five-hours course given by Rolf B.F. Schumacher in the systematic assessment, control, and determination of the magnitude of the elements of measurement uncertainties as well as the overall uncertainties of measurements and calibrations, with special emphasis on the control of measurements and calibrations as repeatable processes.

The course will also show how a program to assure the systematic determination and control measurement assurance program can become an integral part of an organization's total quality program.

Instructor

Rolf B.F. Schumacher, P.E., MS in EE Senior Metrologist at Rockwell International with over 25 years experienced in standards and calibration laboratories, author of many articles and papers on measurement uncertainties, calibration control systems, and quality control. Senior Member IEEE and PMA. He was awarded the grade of Fellow of the American Society for Quality Control (ASQC) for his work in measurement uncertainties, calibration control systems, and quality control. Senior Member IEEE and PMA. He was awarded the grade of Fellow of the American Society for Quality Control (ASQC) for his work in measurement uncertainty determination, calibration control systems, and quality control. Chairman of the ASQC Writing Group for Quality standards for Calibration Systems and the Quality Control of Measurements. Member advisory group on international standards on measurement uncertainties, member ETA Kappa Nu and Tau Beta Pi.

Tuition

Open enrollment classes: $795 per person. Organization classes available.

For Further Information

Please contact Marlene Chandler, Coast Quality Metrology Systems, Inc., (714) 492-6321, 35 Vista del ponto, San Clemente, CA 92672-3122.
Training Information

notebook and refreshments during the class hours. It does not include meals or hotels.

For Further Information

If you would like more information, please contact:
DALFI, Inc.
9888 Carroll Canyon Road Suite 1000
San Diego, California 92126
(619) 578-9500

HAZARD COMMUNICATION TAUGHT AT UNIV. OF UTAH

Title: Implementing A Quality Hazard Communication Program: A Step-By-Step Approach

Date & Location: June 27, 1989 - Salt Lake City, Utah

Who Should Attend: Clinical laboratory personnel, plant engineers and housekeeping personnel interested in learning everything they need in the health care setting to conduct a proper chemical inventory, computerize that inventory, if appropriate, write objectives and a written plan that meets OSHA and College of American Pathologists (CAP) guidelines for healthcare facilities.

Tuition: $150

Course Director: Terry Jo Gile, MT (ASCP), Ma Ed.

For Further Information: RMCOEH CE Program Coordinator, University of Utah, Bldg. 512, Salt Lake City, Utah 84112, (801) 581-5710

MICROPROCESSOR TRAINING COURSES SCHEDULE ANNOUNCED

Micro Systems Institute announces the 1989 Spring schedule for our two microprocessor troubleshooting courses.

Our new Advanced Microprocessor Troubleshooting Techniques seminar will be held:

April 12-14 – Chicago (Northbrook Ramada Inn)
April 18-20 – Atlanta (Amberley Suite Hotel)
April 25-27 – Dayton (Dayton Mall Holiday Inn)
July 24-26 – Washington, D C (Key Bridge Holiday Inn)

This new three-day hands-on course provides advanced troubleshooting training for technicians and engineers who have a basic knowledge of digital troubleshooting. Over 50% of class time will be "hands-on." The fee is $795.00.

Our Troubleshooting Microprocessor-Based Equipment and Digital Devices seminar will be held: (See NCSL Newsletter, April 88 for Course Description, pp 17-18)

May 9-12 – Milwaukee (Holiday Inn South Airport)
May 30-June 2 – Oklahoma City (Hilton Inn West)

June 13-16 – Portland (Red Lion-Jantzen Beach)
June 20-23 – Denver (Holiday Inn Airport)

This comprehensive four-day course was designed to provide a solid background in microprocessor fundamentals and troubleshooting techniques for technicians and engineers. Equipment familiarization and "hands-on" experimentation are emphasized. The fee is $845.00.

Micro Systems Institute
73 Institute Road
Garnett, Kansas 66032
(913) 898-4695

CONTACT: Janet McHenry, (913) 898-4695

MOVONICS COURSE DATES SET

Here is advance word about our schedule for 1989. The Digital Troubleshooting seminar will be held in:

St. Louis, MO Apr 10-13
Chicago, IL Apr 25-28
Minneapolis, MN May 1-4
Sacramento, CA May 22-25
Anaheim, CA Jun 12-15
Mountain View, CA Jun 26-29
Paramus, NJ July 11-17
Boston, MA July 17-20
Seattle, WA Aug 1-4
Salt Lake City, UT Aug 7-10

The cost is $795.00, but two or more people can save $50 each by registering by Jan 31 and attending together. Call for details.

The Microprocessor troubleshooting seminar will be held in:

Washington, DC Apr 10-13
Mountain View, CA Apr 24-27
Paramus, NJ (NY area) May 16-19
Boston, MA May 22-25
Chicago, IL Jun 20-23
Green Bay, WI Jun 26-29
Anaheim, CA July 17-20
Seattle, WA Aug 7-10
Mountain View, CA Aug 28-31
San Diego, CA Sept 18-21
Minneapolis, MN Oct 2-5

We Guarantee that your improved troubleshooting skills will pay back the seminar fee within 6 months or we refund your money! Call us – (415) 960-1250 – for references, questions, and for a seat in two of the best seminars in electronics industry.

Movonics Company, 253 Martens Avenue, Mountain View, CA 94040
## METROLOGY CALENDAR

### BOARD OF DIRECTORS MEETING DATES

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<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Location</th>
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<tbody>
<tr>
<td>April 24-26, 1989</td>
<td>NCSL Dallas/Ft. Worth Section, Region 6</td>
<td>DFW Airport (Area) TX</td>
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<td>July 13-14, 1989</td>
<td>NCSL Phoenix/Tucson Section, Region 8</td>
<td>Tucson, AZ</td>
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<tr>
<td>Oct. 2-4, 1989</td>
<td>NCSL BOD Meeting</td>
<td>Toronto, Ontario, Canada</td>
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<tr>
<td>July 13-14, 1989</td>
<td>NCSL BOD Meeting</td>
<td>Denver, Colorado</td>
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<tr>
<td>Oct. 2-4, 1989</td>
<td>NCSL BOD Meeting</td>
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### APRIL 1989

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<td>NCSL Dallas/Ft. Worth Section, Region 6</td>
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<td>6</td>
<td>NCSL Chicago Section, Region 11</td>
<td>Braidwood, IL</td>
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<tr>
<td>10</td>
<td>GIDEP Metrology Committee</td>
<td>Alexandria, VA</td>
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<td>11</td>
<td>NCSL Twin Cities Section, Region 11</td>
<td>Minneapolis, NM</td>
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<td>24-26</td>
<td>NCSL BOD Meeting</td>
<td>Toronto, Ontario, Canada</td>
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<tr>
<td>27</td>
<td>NCSL Phoenix/Tucson Section, Region 8</td>
<td>Phoenix, AZ</td>
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### MAY 1989

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<tr>
<td>1-2</td>
<td>National Forum For Lab Accreditation</td>
<td>Arlington, VA</td>
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<tr>
<td>17</td>
<td>NCSL San Diego Section, Region 8</td>
<td>Joint with ASQC and FMA San Diego, CA</td>
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<tr>
<td>24</td>
<td>NCSL L.A. Valley Section, Region 8</td>
<td>San Fernando Valley, CA</td>
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### JUNE 1989

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<td>DFW Airport (Area) TX</td>
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<td>10</td>
<td>NCSL EMF Steering Team Meeting</td>
<td>Denver, CO</td>
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<tr>
<td>9-16</td>
<td>NCSL 1989 workshop and Symposium</td>
<td>Denver, CO</td>
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<tr>
<td>16</td>
<td>NCSL Intrinsic and Derived Standards Committee</td>
<td>Denver, CO</td>
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<tr>
<td>19</td>
<td>NCSL South Section, Region 6</td>
<td>Austin, TX</td>
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### AUGUST 1989

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<tr>
<td>14</td>
<td>GIDEP Metrology Committee</td>
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<td>20</td>
<td>NCSL LA/Orange County Section, Region 8</td>
<td>Anaheim-Costa Mesa-Irvine (Area) CA</td>
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### OCTOBER 1989

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<tr>
<td>2-4</td>
<td>NCSL BOD Meeting</td>
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<td>NCSL Phoenix/Tucson Section, Region 8</td>
<td>Tucson, AZ</td>
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<tr>
<td>12</td>
<td>NCSL Region 11 &quot;Teleconference&quot;</td>
<td>Chicago, IL</td>
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<td>10</td>
<td>NCSL Region 11 &quot;Teleconference&quot;</td>
<td>Twin Cities, MN</td>
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<tr>
<td>18-20</td>
<td>NCSL Equipment Management Forum Committee</td>
<td>Manhattan Beach, (LA) CA</td>
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<tr>
<td>20</td>
<td>EMF Steering Team Meeting</td>
<td>Manhattan Beach (LA Area) CA</td>
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<tr>
<td>23-26</td>
<td>GIDEP Annual Workshop</td>
<td>St. Paul, MN</td>
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<td>27</td>
<td>Region 11 &quot;Teleconference&quot;</td>
<td>St. Louis, MO</td>
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<td>25</td>
<td>NCSL San Diego Section, Region 8</td>
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### NOVEMBER 1989

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<td>NCSL Dallas/Ft. Worth Section, Region 6</td>
<td>DFW Airport, (Area) TX</td>
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<tr>
<td>16</td>
<td>NCSL LA/Valley Section, Region 8</td>
<td>San Fernando Valley, CA</td>
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### FEBRUARY 1990

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<tr>
<td>TBA</td>
<td>Measurement Science Conference (MSC)</td>
<td>Anaheim, CA</td>
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<tr>
<td>TBA</td>
<td>NCSL Intrinsic and Derived Standards Committee</td>
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### JUNE 1990

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<th>Event Description</th>
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<tbody>
<tr>
<td>11-14</td>
<td>Conference on Precision Electromagnetic Measurements (CPM)</td>
<td>Ottawa, Ontario, Canada</td>
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- 11 -
Dear Jubilee Sponsors, Authors, Registrants and Delegates to WRSGC, TCSG, IMEKO TC-3 and TC-15!

The 50-Year Celebration of the wide-spread availability of bonded resistance strain gages and brittle coatings for stress analysis purposes, and of strain gages for transducer applications such as load cells, is now over!

The fact the strain gage was conceived by Ed Simmons already in 1936 and that brittle coatings were used in Germany some years before that, was adequately established in the record. Their wide-spread use in commercially available form was what was really being memorialized.

The Celebrations were held in two distinct parts, each with its own mission:

1) June 9-10, 1988, Portland, Oregon at the 6th International Congress of the Society for Experimental Mechanics, Sponsored by the Western Regional Strain Gage Committee at its 64th Semi-Annual Meeting, with support of SEM's technical Committee on Strain Gages.

That portion of the Jubilee emphasized the contribution of U.S. Inventors to the field. Since the bonded resistance strain gage was a uniquely American invention and the inventors and many of the early pioneers are still alive, it took the form of a giant "family home-coming" at which individuals who had not seen each other in decades, reminisced and were able to share their experiences, trials, tribulations and successes with each other and the younger generation.

Time and time again those taking part remarked how awed they felt to be present. "This is august company, and I feel privileged to be in your midst!" said one engineer; a sentiment echoed by many others. Many of the old-timers, away from industry for decades, were proud to see what had become of their work, and many leading engineers learned some of the poignant and little-known background of their profession. "It was hard to imagine what the world was like before these methods were invented," said one young engineer. "Now I have heard what it was like back then, I am impressed by these guys and their cleverness."

Pioneers had an opportunity to spend a few minutes sharing their experiences with the group, and many deceased Pioneers were memorialized – see Summary of Presentations in the report. It was a Family Affair!

2) Houston, Texas, October 19, 1988 at the XIth World Congress of the International Measurement Confederation, organized by its Technical Committees TC-15: Measurement in Experimental Mechanics, and TC-3: Measurement of Force and Mass. ISA's 43rd Annual Conference & Exhibit was host to the first IMEKO Meeting in the Western Hemisphere and arranged and organized all of its functions, Sessions & Round Tables.

That portion of the Jubilee was devoted to documenting how these inventions had spread around the globe, and the IMEKO JUBILEE PREPRINT contains the stories from 20 countries.

Although many of the participants had met each other fairly regularly at various IMEKO Word Congresses (every 3 years) or Technical Committee Symposia (much more frequently), this was a businesslike, professional meeting without the "family reunion" flavor found at Portland. Almost none of the pioneers in each participating country were present. They were being honored in the papers rather than in person, as had been possible in Portland. The audience, however, paid rapt attention and many new acquaintances and friendships were formed. "It's fascinating to learn how in each country the problems which required the use of these methods were different, and of the various paths by which they arrived!" was a common comment.

Each of the Jubilee Parts accomplished its mission, each in its own way.

The 2-day slot made available in Portland was barely adequate for a thorough coverage of the mission of that Jubilee. The 4-hour back-to-back Round Table slots provided by the organizers in Houston made for a very crowded schedule. All Jubilee functions were voice and video-tape recorded, and copy machines were available at each Jubilee so that any historic documents could easily be shared and last-minute transparencies made. Lunches, breaks and receptions at each Jubilee enabled registrants to mingle socially, and were included in the extensive photographic coverage of all events.

In Portland, the Jubilee attracted over 160 of the about-450 Congress Registrants. In Houston, IMEKO had about 463 registrants, the FISA about 2800 at the Sessions and some 28,000 at the exhibits.

Respectfully submitted, October 28, 1988

Peter Stein, Jubilee Coordinator

Editor's Note: Peter Stein has personally made this 50th year retrospective a success. If any reader didn't attend, copies of the proceedings will be published in late 1989 as the Golden Book of strain gages, etc.
By "legal metrology" we mean classes of measurement which are the subject of legal or Government regulation, usually by nations, but sometimes also by subdivisions of nations. For illustration, in the United States, commercial weights and measures are regulated by the States, with the Federal Government (NIST) participating in only an advisory role. However it is to the obvious economic interest of the States that their fundamental units agree with those of other States and with other nations which constitute their market or source of supply.

In some countries, legal metrology is restricted to a few quantities used in trade; length, mass, volume. In other countries almost all working measurements are the subjects of regulation. It is a recognizable tendency in the world for the scope and inclusiveness of Government regulation of measuring devices to increase, as more emphasis is placed on the perceived need to protect the individual, from the financial, health and environmental points of view. Almost every nation possesses a National metrological service, and in most nations the National Measurement Laboratory is responsible for the proper technical application and support of legal metrology.

Obviously, it is desirable to coordinate and harmonize such regulations between political units, to avoid the confusion which would result from a diversity of legal requirements. The International Organization for Legal Metrology (the acronym of whose French name is OIML) was established as an intergovernmental organization in 1955 for this purpose. Unlike voluntary standards organizations such as IEC and ISO, OIML is established by treaty, and the signatories, which include the United States and some 50 other nations of both the western and eastern blocs, are members of the Treaty. Signatories assert that for any measurement regulated in their nation, and for which there is an accepted OIML document, that nation will make its "moral best effort" to install it in place of national regulation. Thus OIML is, in effect, in the business of writing model laws for the regulation of measuring devices.

The United States was late in recognizing the need to be active in these efforts, and joined the Treaty in 1972, when it began to be obvious to U.S. manufacturers of weighing scales that they could no longer sell their products in some countries because they did not conform to local law. At this time the State Department assumed responsibility for U.S. participation, but quickly passed the operational responsibility to the NBS, where it now resides.

I have served as a volunteer delegate to a number of OIML secretariats over the last 15 years. Most of my colleagues from other nations are officers of government departments. In the United States, we make an effort to enlist the interest and participation of experts from industry as well, as commentators on documents and as active participants on committees. In 1992, Europe intends to be a single marketplace, with uniform legal requirements for product, and for regulated measuring devices; these will be OIML prescriptions. U.S. manufacturers must participate in the formulation of these laws, if we are not to find ourselves an island whose products do not conform to the legal strictures of what will be perhaps the world's largest market. For example, I am presently working on a OIML initiative which would provide for mutual international recognition of pattern approvals and verifications; an obviously enormous time and money advantage to multinational distribution, in which we must win the right to participate, or suffer the consequences.

I list here first the existing Secretariats of OIML, and then the International Recommendations already in place. I am eager to hear from colleagues in NCSL who would like to know more about any of these, would like copies of documents, or would like to participate actively. I will undertake to reply to every communication, and, if interest on a topic appears to be general, to publish on the subject in the Newsletter.

OIML PILOT SECRETARIATS

| SP1 | Terminology |
| SP2 | General legal metre |
| SP4 | Length, area, angle |
| SP5 | Static liquid volume |
| SP5D | Dynamic liquid volume |
| SP6 | Measurement of gas |
| SP7 | Measurement of mass |
| SP8 | Weights |
| SP9 | Measurement of density |
| SP10 | Meas instr for vehicles |
| SP11 | Measurement of pressure |
| SP12 | Temperature and heat |
| SP13 | Elec and Magnet quant |
| SP14 | Acoustics and vibration |
| SP15 | Optics |
| SP16 | Ionizing radiation |
| SP17 | Measurement of pollution |
| SP18 | Character of food prods |
| SP19 | Character of materials |
| SP20 | Prepackaged products |
OIML INTERNATIONAL RECOMMENDATIONS

1. Cylindrical weights of medium accuracy class
2. Rectangular bar weights of medium accuracy class
3. Metrological regulations for non-automatic weighing instruments
4. Volumetric flasks in glass
5. Meters for liquids other than water with measuring chambers
6. Clinical thermometers (mercury-in glass) with maximum device
8. Verification and calibration of reference blocks Brinnel hardness
9. Ibid, Vickers
10. Ibid, Rockwell B
11. Ibid, Rockwell C
12. Polytetrafluoroethylene
13. Instruments for measuring hectolitre mass of grain
14. Manometers for blood pressure
15. Indicating pressure gages
16. Disappearing-filament optical pyrometers
17. Recording pressure gages
18. Weights of classes E(1), E(2), F(1), F(2), M(1)
19. Taximeters
20. International alcoholometric tables
21. Tire pressure gages
22. Standard meter bar for verification officers
23. Standard weights for verification officers
24. Medical syringes
25. Volume meters other than water; ancillary equipment
26. Technical regs for non-automatic weighing devices
27. Capacity measures (serving measures)
28. End standards of length (gage blocks)
29. Diaphragm gas meters
30. Rotary piston and turbine gas meters
31. Conventional value of the result of weighing in air
32. Accuracy classes of measuring instruments
33. Material measures of length for general use
34. Verification of indentors for hardness testing machines
35. Verification of hardness testing machines (Brinell)
36. Ibid, Vickers
37. Ibid, Rockwell, B, F, T A, A, N
38. Standard graduated pipets for verification officers
39. Standard burettes for verification officers
40. Metal stamps for verification officers
41. Standard graduated glass flasks for verification officers
42. Alcoholometers and alcohol hydrometers
43. Casks and barrels
44. Electrical energy meters for direct connection
45. Standard weights for testing high-capacity weighing machines
46. Tungsten ribbon lamps for calibration of optical pyrometers
47. Water meters for cold water
48. Continuous totalizing automatic weighing machines
49. Checkweighing and weight grading machines
50. Hexagonal weights of ordinary accuracy class
51. Test methods: elastic sensing elements for pressure measurement
52. pH scale for aqueous solutions
53. Speedometers, Mechanical Odometers and chronotachographs
54. Standard solutions reproducing conductivity of electrolytes
55. Measuring assemblies, other than water, with volume meters
56. Sound level meters
57. Moisture meters for cereal grains and oilseeds
58. Metrological regulations for load cells
59. Automatic gravimetric filling machines
60. Performance characteristics of metal resistance strain gages
61. Petroleum measurement tables
62. General requirements for materials testing machines
63. Req. for machines for tension and compression testing
64. Length measuring instruments
65. Calibration methods for conductivity cells
66. Glass capillary viscometers for meas. kinematic viscosity
67. Det. of intrinsic and hysteresis errors of gas analyzers

February 17, 1989
Butler County Community College will have 15 metrology students available for employment beginning May 22, 1989. A brief biography and a photograph of each class member is provided below.

The metrology staff at Butler County Community College is currently working on improvements and revisions of the curriculum. The original 12 credit hour courses in metrology are being modified to be more consistent with traditional college class credits. The topics are being organized into separate classes which reflect subject areas in the field of metrology. Some examples are: Physical Metrology, Electrical Metrology, I, II, and III, Analytical Chemistry, Statistics & Statistical Process Control, and Microprocessor Programming & Interfacing. In addition, a separate course will emphasize microcomputer applications such as data base management, spreadsheets, and word processing, as well as microcomputer programming in BASIC.

A meeting of the Metrology Program Advisory Board will be planned as soon as the final changes are made. The new revisions in the program will be in place for Fall 1989 freshmen. Please contact Mr. Fred Kinnick of the Job Placement/Counseling Office at (412) 287-8711, extension 325, or Mrs. Lynn Thompson of the Metrology Department at (412) 287-8711, extension 288 or 295 for more information.

**Stuart Brown**

I am anxious to pursue a career in Chemical or Dimensional Metrology, preferably in a Quality Control Lab. I am confident that the theory and lab skills I have acquired will allow me to meet the needs of my employer. I plan to continue my formal education by attending night school. Although I will consider relocation, a position in western Pennsylvania is preferred. I can be contacted at 190 Beacon Road, Renfrew, PA, 16053, or (412) 586-7457.

**Anthony Colangelo**

I am interested in an entry-level position in technical measurement. My communication skills are very good as are my hands-on skills. I financed most of my education by working while attending school. I have no geographical preference and would enjoy traveling. I feel that I adapt very well to any working environment. I can be contacted at 1075 Saxonburg Boulevard, Saxonburg, PA, 16056, or (412) 325-2877.

**Larry Collingwood**

I am currently in my final semester of the Metrology Program at Butler County Community College. A position working in a dimensional, digital, or optical area of metrology is desired. I am looking forward to applying my skills within a working Metrology laboratory. I have no geographic preference for a job location. I can be contacted at R. D. #1, Emlenton, PA, 16363, or (412) 867-0414.

**William E. Crupe**

I desire a position in a Metrology/Quality Control Laboratory, preferably one that deals with a variety of measurement areas. My 4.0 GPA shows that I have been successful in a rigorous, multifaceted program. In addition, I have gained the ability to apply this knowledge in writing and interpreting procedural material. My geographical preference is the midwest or middle Atlantic states. I may be contacted at P.O. Box 1783, Butler, PA, 16003, or (412) 283-2578.
Friel: I am eager to acquire a position in the field of Metrology or in Quality Control. The training I have received at Butler County Community College will enable me to excel in the areas of optics, chemistry and dimensional Metrology. I am confident that I can apply my measurement skills in these fields. I would like to continue my education in Chemistry and Physics while employed. I have no geographical preference for a job location. I can be contacted at 545 East Pearl Street, Butler, PA, 16001, or (412) 287-2626.

Guffey: I especially enjoy non-destructive testing (NDT) and statistical process control (SPC). As a graduate of the Metrology Program in August 1989, I am looking forward to applying my Metrology knowledge. The program has allowed me to learn and achieve several skills in technical areas. I am eager to apply my knowledge and education to my career. I can be contacted at 3255 Unionville Road, Evans City, PA, 16033, or (412) 776-6427.

Guzy: Chemical/medical and dimensional areas of Metrology are my main interests. My present goal is to obtain a challenging position in research and development or sales. I feel certain that my education and experience in business, with emphasis on computers, will prove valuable to my career. My long range objective includes applying equipment operation techniques in the sales field. I am willing to relocate and prefer employment in the Eastern United States. I can be contacted at R. D. #2, Box 549, Valencia, PA 16059, or (412) 898-3653.

Hartmann: I am eagerly seeking a challenging career in the Biological, Biomedical, or Chemical fields of metrology, preferably in the area of research and development. Areas of competency and interest from my Metrology program include Optics, Statistical Process Control, and Experimental Design/Analysis. My educational background includes Bachelors' degrees in Biology and Psychology. I will be available in June 1989 for a summer internship and in August 1989 for full-time employment. Interested companies can contact me at: 116 New Castle Street, Zelienople, PA, 16063. Telephone (412) 452-7344. I am willing to relocate.

Henricks: I am anxious to apply my knowledge and training to a position in Metrology and Quality Control. With the skills obtained at BCCC and a strong mechanical background, I feel that I will be an asset to any company utilizing Metrology and/or process control. I am especially interested in digital electronics, dimensional Metrology, and automated systems. I plan to further my education (while working) in Science and Statistical Process Control. I will be happy to relocate if necessary. I can be contacted at 4149 Grandview Avenue, Meridian, PA, 16001, or (412) 482-4192.

Jackson: I am presently seeking an entry-level position in Metrology. I would like to obtain a position in which my education at Butler County Community College could be put to use. At the present time, I have no geographical preference. I can be contacted at R. D. #4, Titusville, PA, 16345, or (814) 827-6897.
McElwain: I would enjoy working in electrical, digital, or microprocessor applications of Metrology. I believe the training I have received from my two years of college qualify me for employment in these areas. I prefer to remain in the Eastern United States. I can be contacted at R. D. #1, Box 450, Fombell, PA 16123, or (412) 758-9937.

Gabriel: Age 22, Married. The Metrology Program at Butler County Community College has been an enriching experience for me. Never before have I been able to apply classroom theory in a practical manner as I have been privileged to in numerous labs and experiments. The education I received and embraced in Metrology has exposed me to many different fields of measurement. I am particularly interested in optics, although I've found that I enjoy all types of measurement in various degrees. I am confident that I can prove myself a worthy addition to any company. Through life's experiences and school work, I have realized that through dedication, persistence, and hard work, one can be successful in large endeavors as well as small. I give 100% to my work—my 4.00 GPA attests to it. I can be contacted at 257 McKay Road, Saxonburg, PA, 16056, or (412) 352-9225.

Salkeld: I am presently seeking a challenging position in the electrical, optical, or chemical areas of Metrology. After finishing my classroom studies in May, I will be ready to start

Zarnick: I plan to complete my classroom studies in the Metrology Program at Butler County Community College in May 1989. My first priority after May is to obtain an internship, which is the final requirement of the Program. After completing my internship, my main objective is to secure an entry-level position in a Metrology or Quality Control Lab. I have maintained a 3.5 GPA in Metrology. I would like to work on the East Coast, but will consider job locations elsewhere. I can be contacted at 428 Negley Avenue, Butler, PA, 16001, or (412) 283-3276.
A CRUCIAL MEETING....  FOR METROLOGY & EQUIPMENT MANAGERS

Oct. 18-20, 1989, Los Angeles, CA

The Equipment Management Forum (EMF) is presented by the Equipment Management Committee of the National Conference of Standards Laboratories. The Equipment Management Committee promotes the advancement of equipment management concepts. This is accomplished through meetings, workshops, publications, surveys and other information exchange activities.

The Annual Forum is comprised of workshops, technical paper presentations and a general dissemination of equipment management information. You will find papers and workshops on a variety of topics:

- Acquisitions
- Audits
- Automation
- Bar Coding
- Calibration
- Computer Systems
- Documentation
- Electronic Communication
- Equipment Evaluation/Selection
- Job Descriptions
- Leasing and Renting
- Maintenance/Repair
- Property Accountability
- Property Disposal/Surplus
- Property Tracking
- Transportation
- Equipment Utilization

CONTACT: NCSL Secretariat (303)440-3339
MEMBERSHIP

The quarterly report of membership, separated by those who have paid their 1989 dues and those who have not, was prepared and appropriate sections mailed to Regional Coordinators and NCSL Directors. As specified in NCSL Administrative Guideline 2.1.3, complete reports were sent to the President, Executive Vice President, each Vice President, the Secretary, and the Treasurer.

The total membership was 924. This was an increase of 59 members for the fourth quarter of 1988. We actually approved 101 new members during the quarter. The difference between the number of new members at the net increase is accounted for by the 42 we dropped for non-payment of 1988 dues.

Obviously, it was a good quarter for new members. Six of the new member applications were on forms inclosed with the 1989 Announcement/Call For Papers mailed for NCSL by John Fluke Co. We provided an application form to inclose with each of the 1989 Announcement/Call For Papers that they gratuitously mailed.

Ken Armstrong, Business Manager

QUARTERLY MEASUREMENT ASSURANCE COMMITTEE REPORT

1. Round-Robin Interest:

In addition to the responses reported in October three labs responded to the Newsletter article and a few of the Washington sign-ups responded to my mailing with additional areas of interest.

This brings the total interested member labs to date to ten. Most are interested in more than one round-robin, for a total of 31 among the ten labs. Breakdown is as follows:

- **DC Volt**: 10 (10V: 5, 1,018V: 2, 1V: 3)
- **Resistance**: 9 (10k: 5, 1 Ohm: 4)
- **Mass**: 3
- **Miscellaneous**: 9 (one each for temperature, moisture, force, volume, and angle gage blocks, microwave, pressure, thread wires, and spherical diameters).

Unfortunately, there are quite a few in the "one only" category. Perhaps the publication of this breakdown in the Newsletter and mailing to all interested labs (after the Holidays) will reach a few that hadn't responded yet. As long as only two labs are interested in the same area and range, they can exchange artifacts between themselves without waiting for the rest of the world (as long as the measurements involved lend themselves to that approach).

2. Gage Block Group Meeting:

The group held a meeting here at Beckman on December 13, chaired by Jack Edison, to discuss Round Three results.

Since the blocks, the group had been using had to be returned to the owner, the possibility of NCSL supplying two sets of blocks was discussed, but not promised. The group surprisingly voted for steel blocks, with a few "fancy" ones thrown in, rather than the other way around. This makes the first cost quite a bit lower, but more would have to be replaced along the way.

The majority also voted for an NBS calibration, which we may not be able to fund. The possibility for a freebie has not been explored yet, and the feasibility of the members for their share, which should alleviate any accounting problems in that regard.

At the same meeting, Roy George of Pennoyer Dodge suggested a thread plug round-robin and volunteered to furnish gages and wires to be used. A fair number of the attendees showed a strong interest.

3. '89 Plans and Objectives:

Since I am still way behind in my work after an absence of 13 months, plus a new project to spend 50% of my time on, there is not much left to plan on. What I should really do is resign so somebody else can pick up the ball and run with it. Rather than to bring everything to a complete halt, I'll ask you to look around for a victim while I try to get this thing going. The Volt R'R can't start until late summer when the 732 is due back from the Florida group. Thomas resistors do not like extreme weather, so 1 Ohm should wait until late spring, at least for back East. Have picked some shipping containers which should hold two resistors each. They should have been ordered over a month ago. The 732 will have to be hand-carried, or we'll have to spend a few thousand bucks on a big box, charger and extra battery packs, which doesn't seem too feasible. That's as far as I dare look ahead at this point. On mass, I'm sure Jack can come up with a fair start as soon as some of the other stuff gets going. On all the rest, all we can hope to do is wait for more and play middle-man, being careful to get permission before mentioning any company names. Some may not want to exchange any favors with competitors - who knows?

Arno Ehman, Chairman

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BIOMEDICAL AND PHARMACEUTICAL METROLOGY COMMITTEE – Chaired by Doug Smith of Abbott Laboratories.

During the past quarter, they held a one day forum in the Chicago area. The forum on October 27, 1988, drew 25 persons. This excellent group of individuals made for a very successful meeting. All are looking forward to the next “NCSL Forum on Biomedical and Pharmaceutical Metrology” to be held in the third quarter of 1989 in the Boston area. The 1989 forum will be hosted by MKS. The experience of the Chicago Forum points out the importance of a quality program and the attendance it will command.

The Committee will continue to develop and conduct MAPs for the Pharmaceutical industry. They are going to continue with their mass MAP and work on developing MAPs for resistance, temperature (122 degrees Celsius) and possibly voltage.

The NCSL recommended practice number six (6) has been reviewed and no changes are required at this time. In addition, the RP will be reprinted as supplies are dwindling. This is being coordinated with Ken Armstrong at the Secretariat.

The Committee is also looking into the area of publishing monographs or tech notes on specific measurement areas of interest to the Biomedical and Pharmaceutical community. These will be on areas of measurement where there is no NIST traceability.

UTILITIES COMMITTEE – Chaired by Ray DiSandro of Philadelphia Electric Company.

Due to outages at several of the key power companies, the Fall of 1988 meeting was rescheduled to March 22 and 23, 1989. The forum will still be held at Duke Power in the Southeast U.S. Ray is putting together an excellent agenda in hopes of drawing a big crowd. This meeting will be called the “NCSL Forum on Utilities Metrology Management”. The Utilities Committee would like to attempt to have two of these forums each year. One in the Spring and one in the Fall. They will be held at various locations around the country.

The committee has started work on a recommended practice on the “Calibration Control System in the Utilities Industry”. A draft is expected to be ready by the end of 1989. In addition, the committee is exploring other products such as a Utilities Laboratory Manager’s Handbook or technical monographs.

The committee is also establishing support and liaison to other NCSL committees and technical organizations.

EMF COMMITTEE – Chaired by Dale Kemper of McDonnell Douglas of Mesa, Arizona.

The EMF Committee has taken on three major goals for the future. The first is to maximize participation in the Annual Equipment Management Forum. Second, continually improve the quality of the information products that result from EMF Committee activities. Third, the committee has the goal of enhancing industry’s perception of the value of having an effective equipment management function in their companies.

These are aggressive goals, but I feel very attainable over time. Given the leadership of Dale Kemper, I expect the Annual EMF in October of 1989 will be as successful as possible.

The EMF Steering Team met February 2, 1989, in Manhattan Beach, California to work on forum plans as well as review the hotel facilities contracted for the meeting.

QUARTERLY REPORT TRAINING INFORMATION & DIRECTORY COMMITTEE

The 1989 edition of the Training Information Directory was completed and 873 copies were mailed out on November 23rd. A supply of additional copies was mailed to the NCSL Business Office in Boulder for use in new member packages. The total cost for printing and mailing was $2,611.66 using bulk rate domestic and first class foreign. The increase over last year was due to higher foreign postage rates and inclusion of sales tax for the first time.

I have found that the Postal Service will give a 50% discount on bulk rate for non-profit organizations, but the annual fee of $60.00 would just about cancel out any savings on the Training Information Directory. However, it might be worth obtaining a non-profit organization permit if other NCSL mailings would bring the volume up.

David A. Lorenzen, Chairman
Training Information & Directory Committee
National Measurement Requirements Committee

1989 Goals and Objectives

Objectives

National Measurement Requirements Survey

Preliminary Report January 1989

Final Report April 1989

National Measurement Requirements Committee Meetings

Measurement Science Conference January 1989

NCSL Annual Conference Workshop July 1989

Workshops

NCSL Annual Conference Pressure Calibration w/NIST Flow Calibration w/NIST July 1989

Goals

National Measurement Requirements Survey

Complete and publish a report describing the adequacy of the NIST to provide services that support the measurement needs of U.S. industries. These industries will be identified according to their activities; Aerospace, Power, Petroleum, Medical, Public Utility, etc.

Identify the needs in groups according to NIST organization with individual parameters in each group. The NIST groups are surveyed by NMRC subcommittees who coordinate with their NIST counterparts.

Wherever possible for each parameter identified as new or requiring improvement in calibration capability, the need will be supported by justification that includes a financial impact, advancement of the state-of-the-art, international competitiveness, or similar basis.

Prioritize the most important parameters; however, because of the diverse nature and quantity, only the first ten will be identified in order. Of those ten parameters considered critical enough to be categorized in order of importance, only three of four will be selected for emphasis. The remainder will only be highlighted as critical. Their justification as priority items will be accompanied by clearly stated descriptions of the rational; financial, state-of-the-art, etc., used in their selection.

NMRC Committee Meetings

The NMRC committee chairman and the subcommittee chairman meet at least two times per year to review progress in updating the NMRC survey and to discuss the relative importance of the various needs that have been identified.

NMRC Sponsored Workshops

Sponsor at least two, preferably four, workshops with NIST participation during the NCSL annual conference. The purpose of the workshops will be to describe NIST capabilities and plans for the subject discipline and to encourage audience inputs as to the relevance of NIST activity for their needs; to encourage the audience to assist in forecasting future needs; to gather audience inputs regarding the justification, financial, etc., for their needs.

Laurie Baker, Chairman

Intrinsic and Derived Standards Committee

1989 Goals and Objectives

Objectives

Finalize guidelines by the steering committee.

Organize steering committee meeting at the MSC and NCSL conference. During 1989 appoint members for the first 2 working groups to work out procedures for two intrinsic standards.

Goals

Identify standards that can be considered intrinsic or derived. Appoint working groups for those standards and ensure availability of procedure for these standards.

Klaus Jaeger, Chairman
AMBLER APPOINTED ACTING UNDER SECRETARY FOR TECHNOLOGY

Commerce Secretary C. William Verity announced the appointment of Ernest Ambler as Acting Under Secretary for Technology, a new position in the Department of Commerce. Ambler has served since 1978 as Director of the National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards. Ambler will head Commerce's new Technology Administration, created in legislation signed by President Reagan in October, 1988.

Verity said that “The Under Secretary for Technology will serve as a strategic catalyst to promote the use of science and technology by industry and entrepreneurs and be both a listening post and a new voice for business in Washington on technology.” He said that the new Technology Administration can help American industry remain competitive by putting under one umbrella technological research, technical standards, international agreements, Japanese technical literature, strategic resources, metric conversion, State and local initiatives, and telecommunications and information technologies.

The Secretary also was joined in the announcement by Thomas Murrin, recently retired from the Westinghouse Corporation, who has served as an adviser to the Secretary in developing plans for the new organization. Chairman of the advisory group is Simon Ramo, co-founder of TRW, Inc., of Cleveland; other advisers include Roland Schmitt, President of Rensselaer Polytechnic Institute, and Lewis Branscomb, Director of Science, Technology and Public Policy Program at Harvard University and former Director of NBS.

Verity said that creation of the Under Secretary position has struck a positive chord with the scientific community. He said that statements made by advisers who are working closely with him on creation of the Technology Administration are representative of the response he has received.

Schmitt said that the new Technology Administration is a step forward, welcomed by “all interested in strengthening America's capacity to remain at the forefront of technology development.”

“Either the United States will excel in technology or our living standards will fall and we will not contribute our proper share to world progress,” Ramo said, adding that creation of the new organization is an important signal.

Raymond G. Kammer, currently Deputy Director of NIST, will serve as NIST Acting Director.

NEW INTERNATIONAL REFERENCE STANDARDS OF VOLTAGE AND RESISTANCE TO TAKE EFFECT JAN. 1, 1990

The 18th meeting of the Consultative Committee on Electricity (CCE) of the International Committee of Weights and Measures (CIPM) was held September 27-28, 1988 at the International Bureau of Weights and Measures (BIPM). NIST Director E. Ambler, member of the CIPM and President of the CEE, chaired the meeting and B.N. Taylor attended as NIST representative. Some 30 individuals from 15 countries participated.

In recommendations subsequently approved by the CIPM, the CCE established international, practical reference standards of voltage and resistance based on the Josephson effect and the quantum Hall effect, respectively. This was done by adopting “conventional values” for the Josephson constant and the von Klitzing constant, the fundamental quantities characteristic of the Josephson effect and the quantum Hall effect. Starting on January 1, 1990, all national standards laboratories will use these values with the result that the previous significant differences which existed among national reference standards of voltage and resistance, and between such reference standards and the SI (International System of Units) volt and ohm, will be eliminated. In fact, starting on January 1, 1990, all national reference standards of voltage and resistance shall be equivalent within a few parts in 10^6, and consistent with the SI to within 5 parts in 10^7. This will lead to significantly improved worldwide uniformity of electrical measurements and their agreement with the SI.

To implement the new standards in the U.S. requires that on January 1, 1990, the value of the U.S. reference standard of voltage be increased by about 9.26 parts in 10^6 and the value of the U.S. reference standard of resistance be increased by about 1.69 parts in 10^6.

CONTACT: Barry N. Taylor, (301) 975-4220

NIST IMPROVES RADIOFREQUENCY POWER CALIBRATION SERVICE

In response to requests from a number of industrial customers for reduced uncertainty in NIST's radio-frequency (10 to 1000 MHz) power calibration service, CEE's Electromagnetic Fields Division has carried out a statistical analysis of the service's growing historical database. As a result, the Division can now provide service for suitable transfer standards with an uncertainty of as little as 0.5%, half that offered in recent years. The service had been established with an advertised uncertainty of 0.5%, but technical problems with the...
calorimetric standards resulted in an increase to 1% several years ago.

The historical database consists of the results of repeated NIST calibrations of customer thermistor mounts and of international comparisons. Typical data on customer coaxial mounts from 1972 to 1987 exhibit stability over time with a standard deviation of 0.1%. International comparisons carried out in 1981 showed good agreement between NIST uncertainties within 0.2%. Further, the analysis showed no evidence of any change in the systematic error or in the statistical properties of the random error. These results led to the new uncertainties of 0.5% for 10 to 100 MHz, and 0.65% for 100 MHz to 1000 MHz.

The Division is developing new designs of calorimetric standards expected to reduced uncertainties significantly. In addition, the Division is working with the Electromagnetic Technology Division on an application of the kinetic inductance bolometer as the basis for a new standard for the measurement of radiofrequency and microwave power.

CONTACT: William E. Little, (303) 497-5479

AUTOMATED CALIBRATION OF OPTICAL PHOTOMASK LINewidth STANDARDS

A pre-existing system for calibrating optical photomask linewidth standards has been improved and automated at NIST. The system is used to calibrate linewidth standards (SRMs) which are used by manufacturers of integrated circuits to verify line widths and spacings on photomasks. This system, controlled by a desktop computer, locates each feature to be measured in the field of view of a microscope, scans the image, and calculates the optical linewidth from the scan data. The results are checked for errors and the process repeated until every feature on the photomask has been calibrated. If statistical tests are passed, a calibration certificate is printed.

The automated photomask linewidth calibration system has been demonstrated to provide higher quality data (better precision and accuracy), in addition to significantly reducing the time required compared to the previous manual calibration system.

CONTACT: James Potzick, (301) 975-3481

NIST SCIENTIST ASSISTS FBI

FBI Director William S. Sessions paid tribute to NIST's National Computer Systems Laboratory scientist Raymond T. Moore on his retirement from the Federal service in December of 1988. Sessions cited Moore's international recognition by the scientific fingerprint identification community for his contributions to automated fingerprint identification systems. A group leader in the automated recognition program, Moore and colleagues R. Michail McCabe and R. Allen Wilkinson collaborated with the Federal Bureau of Investigation to automate their fingerprint identification process. Their most recent work was published as NBSIR 88-3831, AFRS Performance Evaluation Tests. Moore will continue his association with the National Computer Systems Laboratory on a part-time basis.

CONTACT: Raymond Moore, (301) 975-2933

NIST SCIENTIST INVITED TO LECTURE IN CHINA

Robert Larrabee of CME's Precision Engineering Division visited Tsinghua University in Beijing, China, and presented a series of lectures on measuring submicrometer dimensions in the optical and scanning electron microscopes. He also visited and presented seminars on the same topics at the metrology laboratories of the State Bureau of Technical Supervision located in Beijing, Chengdu, and Shanghai. His visits led to a very informative exchange of ideas, discussions on current problems of common interest, and questions on each other's opinions about current research and development. The Chinese continue to recover from the Cultural Revolution, but they still have a long way to go to reach the present level of electronic technology in the United States or Japan.

CONTACT: Robert Larrabee, (301) 975-2298

SUPERCONDUCTIVITY BILL SIGNED INTO LAW

President Reagan signed H.R. 3048, the National Superconductivity and Competitiveness Act of 1987 (P.L. 110-697) on November 19, 1988. The law (Section 5) requires NIST to "promote fundamental research and materials standards to accelerate the use and application of the new superconducting materials, and . . . utilize the Superconductivity Center Focussing on Electronic Applications at the National Institute of Standards and Technology in Boulder, Colorado."

CONTACT: Esther Cassidy, (301) 975-3080

BOOK ON THEORY AND PRACTICE OF RADIATION THERMOMETRY PUBLISHED

Wiley Interscience has published a comprehensive volume on Theory and Practice of Radiation Thermometry, sponsored by the Center for Chemical Technology of NIST and edited by Prof. D.P. Dewitt of Purdue University and Prof. G.D. Nutter of the University of Wisconsin. The book is based on the papers presented at the "Symposium on Applications of Radiation Thermometry," held at NIST in May, 1984. The Symposium was sponsored by NIST and ASTM Committee E20, and was co-chaired by Dewitt and Kenneth G. Krider of NIST. This comprehensive treatise includes 21 chapters, covering a wide range of topics, from fundamentals of thermal radiation, radiative properties of materials, and thermography to applications in the steel, aluminum, glass, and plastics...
industries. This volume represents a significant contribution to the field of radiation thermometry and industrial applications.

CONTACT: Kenneth G. Kreider, (301) 975-2619

STEEL AND ALUMINUM ENERGY CONSERVATION AND TECHNOLOGY COMPETITIVENESS ACT OF 1988 SIGNED

The Steel and Aluminum Energy Conservation and Technology Competitiveness Act of 1988, S. 2470 (P.L. 100-680) was signed by President Reagan on November 17, 1988. The law states in part: "The National Institute of Standards and Technology, through its Institute for Materials Science and Engineering and, as appropriate, in coordination with the Department of Energy, shall conduct an expanded program of steel and aluminum research to provide necessary instrumentation and measurement research and development in support of activities conducted under the plan." The law requires that a report be submitted annually to the President and Congress on the research and development activities carried out under the plan during each fiscal year. The law authorized $3 million to NIST for each of the fiscal years 1989 through 1993.

CONTACT: Esther Cassidy, (301) 975-3080

NATIONS FIRST COLD NEUTRON FACILITY DEDICATED AT NIST

On Jan. 12, Commerce officials formally dedicated the nation's first cold neutron research facility at NIST. The event, said Commerce Secretary C. William Verity, "ushers a new era for U.S. science and engineering. "The new facility will include 15 state-of-the-art instruments for advanced materials research, the first three of which will be available within a year. Scientists and engineers from private industry will be able to use the facility for proprietary research, with time allocated by an external advisory committee. Low-energy neutron beams have emerged as one of the key probes in materials research, with applications in a broad range of industries including semiconductor and superconductor research, chemical processing, industrial ceramics, and biotechnology.

CONTACT: Michael Baum, (301) 975-2762

NIST FY 1990 BUDGET PROPOSAL

President Reagan's budget proposal to Congress for FY 1990 included $155.6 million for NIST, compared with $159 million appropriated for FY 1989. Included in the request are increases for computer security, chemical measurements and standards, lightweight measurement technology, bioprocess engineering, high performance composites, high-temperature superconductors, and an upgrade of NIST scientific computers. Also included are several proposed decreases from the 1989 appropriation. Technology transfer centers ($7.5 million) would be funded by FY 1989 on a one-time basis covering several years of operation. Fire and building research programs would be reduced by $3.9 million. Other decreases include: non-energy related inventions (-$150,000), fire research on ignition of upholstery and general toxicity studies (-$250,000), and alternative refrigerants (-$250,000).

CONTACT: Mat Heyman, (301) 975-2762

1989 NATIONAL QUALITY AWARD APPLICATIONS ISSUED

Applications for the 1989 Malcolm Baldrige National Quality Awards are now available. The 31-page application guidelines include a description of the award, an application form, detailed instructions for filling out the form, and specifics on the scoring criteria and examination. The guidelines are available at no cost by writing to the Malcolm Baldrige National Quality Award, NIST, A1123 Administration Bldg., Gaithersburg, Md. 20899. The National Quality Award, established by law in 1987, was inaugurated in 1988 with the announcement of three winners: Motorola Inc., the Commercial Nuclear Fuel Division of Westinghouse Electric Corporation, and Globe Metallurgical Inc. Its purpose is to promote quality awareness, recognize quality achievements of U.S. companies, and publicize successful quality strategies. The deadline for applications is May 5 through September 30. The award ceremony and formal announcement of winners, limited to a maximum of six companies annually, will occur in November 1989.

CONTACT: John Makulowich, (303) 975-2762

NEW CALIBRATION SERVICES OFFERED

The explosive growth of optical fiber use in the communications industry has resulted in a demand for calibration services. NIST's Boulder, Colo., laboratory now offers measurements of optical laser power and energy at wavelengths and power levels of interest to fiber optic producers and users. Measurements are based on a standard reference instrument called the C-series calorimeter. An electrically calibrated pyroelectric radiometer (ECPR) is calibrated against the calorimeter and is then used to calibrate optical power meters at wavelengths of 850, 1300, and 1550 nanometers. To improve calibration capabilities, NIST is preparing test measurement systems for detector linearity, detector uniformity, and detector spectral responsivity. These systems should be available in 6 months. For a paper outlining NIST's optical power measurement capabilities, contact Fred McGehan, Div. 360, NIST, 325 Broadway, Boulder, Colo. 80303. For more information on calibration
services, contact Thomas R. Scott, Div. 724 same address, or phone (303) 497-3651

PAPERS AVAILABLE ON OPTICAL FIBER MEASUREMENTS


CONTACT: Fred McGehan (Boulder), (303) 497-3246

CHARACTERIZING TEM CELLS

NIST has pioneered in the use of transverse electromagnetic (TEM) cells for the generation of standard electromagnetic (EM) fields. Electronic equipment and/or components are inserted into TEM cells and tested for susceptibility to or emission of EM radiation. The cells are also used to calibrate portable probes for the measurement of EM fields. A new publication, "Generation of Standard Electromagnetic Fields in a TEM Cell (TN 1319)," documents the facilities and procedures used by NIST to generate these EM fields. In addition to advantages, limitations, and characteristics of TEM cells, the publication discusses setup and measurement procedures for users, uncertainties in the standard field, and statistical control of the system. Twelve references are reproduced to provide the details of material summarized in the text. Copies of the publication are available from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Order by stock no. 003-003-02889-3 for $12 prepaid.

CONTACT: Fred McGehan (Boulder), (303) 497-3246

NEW BIBLIOGRAPHY LISTS PUBLICATIONS SINCE 1970

Persons interested in the electromagnetic research work at NIST, particularly in the areas of optical electronics, cryoelectronics, and superconductivity, will want to obtain a new NIST bibliography that lists all publications in these three areas from 1970 to the present. The publications discuss measurement methods and standards for laser systems, optical communication equipment, cryoelectronics, and superconducting and magnetic materials. "Metrology for Electromagnetic Technology: A Bibliography of NBS Publications (NBSIR 88-3097)," is available from the National Technical Information Service, Springfield, VA. 22161. Order by PB #88-123682 for $15.95 prepaid.

CONTACT: Fred McGehan (Boulder), (303) 497-3246

DIPPR DATABASE EXPANDED TO 1,023 PURE COMPOUNDS

More than 250 pure chemical compounds have been added to a computerized database on the thermodynamic and physical properties of chemicals. The database, DIPPR (Design Institute for Physical Property Data), Data Compilation of Pure Compound Properties, 1989, now contains information on 39 properties for 1,023 pure chemical compounds of high industrial priority. The database provides chemical engineers, manufacturers, and scientists in industry, government, and universities with quick access to important information on the behavior of substances and their reactions at various temperatures. The chemicals in the database were selected by industry members of the American Institute of Chemical Engineers' (AIChE) DIPPR group, and are considered to be the most important ones to industry. For information on fees and license agreements for NIST Standard Reference Database 11, DIPPR, Data Compilation of Pure Compounds, 1989, contact the Office of Standard Reference Data, NIST, A323 Physics Bldg., Gaithersburg, Md. 20899; telephone: (301) 975-2208.

CONTACT: Roger Rensberger, (303) 975-2762

NIST OFFERS CALIBRATION SERVICE FOR AC DMMS AND SOURCES

A special calibration service for ac digital multimeters (DMMs) and ac voltage calibrators is now available at NIST. Test instruments are calibrated using a recently developed automatic Voltage Calibration System based on coaxial thermal voltage converters. Midrange system uncertainties are less than 20 parts per million with larger uncertainties at low voltages (down to 2 mV) or high frequencies (up to 1 MHz). One week turn-around times are available for short tests on high-accuracy DMMS or sources equipped with an IEEE-488 bus. Special calibration fees begin at $100 for the first 10 test points.

AC current calibrations will be offered in approximately one year and, if there is sufficient interest, a measurement assurance program for ac voltage and current will also be offered using high accuracy sources and DMMs.

Potential customers should contact Nile Oldham at (301) 975-2408.

PROPOSALS REQUESTED FOR 1989 DATA PROGRAM

Project proposals are requested for the 1989 Grants Program on Standard Reference Data to compile and evaluate scientific reference data for scientists and engineers to use in research, development, and the design of industrial processes. Projects will be considered on physical, chemical, or materials properties of well-characterized substances and systems.
Proposed work should include the collection of data from the scientific literature and the critical evaluation of those data. Each project must lead to a publishable compilation, critical review, or computer database containing recommended values with stated uncertainties for the properties in question. The grants program is open to researchers in any U.S. organization, academic or non-academic, non-profit or commercial. Proposals which involve only the compilation of data without the exercise of scientific judgment will not be considered. To apply for a grant, contact the Office of Standard Reference Data, A323 Physics Bldg, NIST, Gaithersburg, Md. 20899; telephone: (301) 975-2200.

CONTACT: Roger Rensberger, (301) 975-2762.

NEW CENTERS TO AID SMALL-, MEDIUM-SIZED COMPANIES

Commerce Secretary C. William Verity recently announced the selection of three organizations that will establish NIST regional manufacturing technology centers to aid small- and medium-sized businesses. The Cleveland, Ohio, Rensselaer Polytechnic Institute in Troy, N.Y., and the University of South Carolina in Columbia, S.C. were selected by NIST to organize the centers. The institutions now will negotiate cooperative agreements with NIST to receive at least $1.5 million in matching funds for the centers. The centers will help smaller firms take advantage of some of the recent and dramatic advances in manufacturing technology resources to be used by these new centers in helping companies is the NIST Automated Manufacturing Research Facility. This research version of the "factory of the future" has been used by government, industry, and universities for years to advance the state-of-the-art in flexible automated manufacturing.

CONTACT: Mat Heyman, (301) 975-2762.

COMPUTER SECURITY BOARD APPOINTED BY NIST

NIST has appointed a 12-member board to advise NIST and the Secretary of Commerce on security and privacy issues pertaining to federal computer systems. The board was established as part of the Computer Security Act of 1987. The act gives NIST, a Commerce Department agency, responsibility for developing standards and guidelines needed to protect the security and privacy of sensitive unclassified information in federal computer systems. The first meeting of the board will take place in early 1989.

REVISED WEIGHTS AND MEASURES HANDBOOKS PUBLISHED

Three handbooks have been revised by NIST to reflect changes adopted at the 73rd Annual Meeting of the National Conference on Weights and Measures (NCWM) held in July 1988. NCWM, an organization of the state, county, and city weights and measures enforcement officials, receives technical support from NIST, a nonregulatory agency, through its Office of Weights and Measures.

NBS Handbook 44-1989. The major changes to NBS Handbook 44-1989, Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices, include a revised section on liquid measuring devices to clarify the code for use by field inspectors; a new set of requirements for identifying the "concentrated load capacity" of large scales such as those used to weigh vehicles; and new marking requirements for grain moisture meters to indicate when the operating range of the meter has been exceeded.


CONTACT: Roger Rensberger, (301) 975-2762.

BROCHURE LISTS FACILITIES FOR JOINT RESEARCH

Need a laboratory for measuring high voltage? How about an ultra-clean room for ceramics processing? Or maybe a transverse electromagnetic cell? A new brochure describes these and many other research and testing facilities at NIST laboratories in Gaithersburg, MD, and Boulder, Colo. These NIST facilities — some unequaled anywhere in the world — are available through different programs to qualified individuals and organizations for collaborative or independent proprietary research. The NIST Research Associate Program, for example, enables sponsoring organizations to pay researchers' salaries while NIST contributes its expertise and allows use of its equipment. To get a copy of the brochure, Facilities, send a self-addressed mailing label to the Office of Research and Technology Applications, A537 Administration Bldg., NIST, Gaithersburg, MD 20899.

CONTACT: John Henkel, (301) 975-2762.
NIST VISITING COMMITTEE

Under section 10 of the Trade Bill, the NIST Visiting Committee has been expanded from 5 to 9 members and charged to review and make recommendations regarding general policy for the NIST, its organization, its budget, and its programs within the framework of applicable national policies. A list of the current members of the Visiting Committee is attached to the end of this report.

NIST REORGANIZATION

The Visiting Committee has approved and sent to the Department of Commerce a proposed reorganization that includes the establishment of the Industrial Technology Services and the technical division reassignments that were proposed last July. None of these actions have been officially approved by the Congress at this time.

NEW INTERNATIONAL MEASUREMENT AGREEMENT IMPORTANT TO U.S. PRECISION ELECTRICAL EQUIPMENT EXPORTERS

NIST Director Ambler represented the U.S. at a series of meetings September 27 through October 6 in Sevres, France, that could be important to U.S. firms interested in exporting high-precision electrical measuring instruments. The meetings of the Consultative Committee on Electricity (of which Ambler is president) and the International Committee on Weights and Measures culminated several years of careful research at standards laboratories around the world, including NIST, by reaching a new agreement on the practical measurement of voltage and resistance. As a result, for the first time, all industrial nations will share a common base for those measurements. With more precise electrical instrumentation, differences in measurements have become a significant problem for U.S. firms seeking to export high-precision electrical instruments. A variety of electrical measuring instruments will have to be recalibrated to maintain consistency with the new standards when they become effective in 1990.

INDUSTRY, GOVERNMENT, UNIVERSITY REPRESENTATIVES VISIT NIST AUTOMATION LABS

About 400 specialists from industry, government and universities toured NIST automation facilities October 5-14 as a part of an "open house" to share information developed at NIST. The highlight of the tour was a visit to the Automated Manufacturing Research Facility (AMRF). NIST has worked closely with industry and the U.S. Navy in setting up this advanced automation research facility. Forty-five firms have entered into Research Associate programs for studies at the AMRF. Nearly 40 companies with an interest in the research at NIST have donated or loaned equipment worth more than $8.4 million. In addition to the AMRF, other stops in the open house included descriptions of research on advanced metal powders and microelectronics measurement.

TECHNOLOGY TRANSFER OPPORTUNITIES FROM NIST EXPLORED BY UNIVERSITY-BASED BUSINESS ASSISTANCE CENTERS

More than three dozen representatives from the National Association of Management and Technical Assistance Centers (NAMTAC) met with NIST officials and toured institute labs October 11 in a special session designed to improve technology transfer from NIST. NAMTAC includes university-based agencies which aim to improve industrial competitiveness and economic development. Many members try to transfer technology from engineering schools and other technical organizations to regional businesses. The group reviewed NIST activities including those in fire and building research, measurement services, and energy-related inventions. Dr. Donald Johnson described NIST’s new technology transfer activities.

AMBLER WARNS AGAINST LETTING DRIVE FOR COMPETITIVENESS OVERSHADOW NEED FOR INTERNATIONAL COOPERATION

In a keynote speech to about 900 members of the Instrument Society of America, NIST Director Ernest Ambler warned against losing sight of the benefits of international cooperation in science and technology as the U.S. strives to be more competitive. Speaking October 17 in Houston, Texas, Ambler stressed that technology has been a major factor in the creation of wealth for nations around the globe. He also cited global environmental and natural resource issues as "perhaps the most universal and far-reaching reason for international cooperation in science and technology that rises above any single nation's competitive goals." So far as improving U.S. competitiveness is concerned, Ambler claimed that "U.S. science overall is still outstanding by any objective measure you care to apply." But, he said, we must build strong links between the base of scientific knowledge and the reduction of this knowledge to practice.

NIST HOSTS CONFERENCE ON TRANSFERRING TECHNOLOGY FROM FEDERAL LABS

About 100 representatives from industry, government agencies, and universities took part in an October 16-18 conference at NIST on "Building Partnerships with Federal Laboratories." Officials from five major federal labs - NIST, National Institutes of Health, NASA Goddard Space Flight Center, the U.S. Army's Harry Diamond Laboratories, and the U.S. Naval Surface Warfare Center - advised participants about how they can work with federal labs to meet their companies' research, development, and commercial application needs. NIST played a key role in organizing the meeting which was sponsored by the High Technology Council.
of Montgomery County, NIST, the Montgomery County office of Economic Development, and the Advanced Technology Organization of Maryland.

NEW 'TESTBED' WILL AID CAD/CAM, LOGISTICS

To speed the development and use of computer-integrated design, manufacturing, and logistic processes, NIST will develop a facility for testing implementations of the Product Data Exchange Specification (PDES). PDES is an ambitious project to develop a standardized format for representing and exchanging information about almost any manufactured product. The specification will include geometric design information and all the information needed to make a part. The National PDES Testbed will have several additional functions, including: seeking out and diagnosing unsolved problems in the developing specification; providing a demonstration site for applications of PDES technology; helping to coordinate a national network of other PDES test facilities; and conducting an information and technology transfer program to speed the implementation of PDES standards. The project is funded by the Defense Department's Computer-Aided Acquisition and Logistic Support (CALS) Office.

CONTACT: Michail Baum, (301) 975-2762

NEW MATERIAL AIMED AT MEASURING WORKPLACE DUST

The various crystalline phases of silicon dioxide which are found in the airborne dusts produced by industries such as glassmaking and mining are potential health hazards which can cause respiratory problems. For this reason, agencies that regulate workplace environments need reference standards to ensure, the performance reliability of the instruments used to monitor industrial dusts. NIST researchers have developed a standard reference material (SRM) consisting of respirable cristobalite powder, a crystalline form of silicon dioxide, which can be used to calibrate the x-ray diffraction instruments used by regulators. A 5-gram bottle of the material (SRM 1879) sells for $239 and can be ordered from the Office of Standard Reference Materials, NIST, B311 Chemistry Bldg., Gaithersburg, Md. 20899; telephone: (301) 975-6776. The SRM was developed as part of a cooperative program with the National Institute of Occupational Safety and Health.

CONTACT: John Henkel, (301) 975-2762

TURBULENCE WITHIN THE WALLS

Turbulence inside pipes makes the measurement of fluid flow difficult. The cost of inaccurate measurements to the petroleum and chemical process industries, for example, can amount to hundreds of millions of dollars annually. Probing this problem, two NIST researchers in the Center for Chemical Engineering have come up with a strategy to predict meter performance for non-ideal installation conditions. Their research could yield a more practical process to check or calibrate an installed flowmeter by determining in-situ the profile to the pipeflow entering the meter. NIST has formed an industry-government consortium to sponsor this research program on flowmeter installation effects. Information on participating in the consortium is available from George E. Mattingly, 105 Fluid Mechanics Bldg., NIST, Gaithersburg, Md. 20899; telephone: (301) 975-5939.

CONTACT: John Makulowich, (301) 975-2762

NEW TECHNIQUE FOR MEASURING WAVEGUIDE LOSS

Scientists in NIST's Electromagnetic Technology Division, Boulder, Colo., have developed a new technique for measuring propagation loss in optical channel waveguides used in optical communication, signal processing, and sensor applications. The technique is based on photothermal deflection effect which employs a laser beam to probe extremely small temperature changes resulting from the absorption of light. Other techniques used currently to measure waveguide losses risk damage to the guide, require special material preparation, or are subject to a large uncertainty due to randomly scattered light. The new technique avoids these difficulties and is applicable to a variety of waveguide materials. For more information, contact Aaron A. Sanders, Division 724.02, NIST, Boulder, Colo. 80303; telephone: (303) 497-5341.

CONTACT: Fred McGehan (Boulder), (303) 497-3246

BETTER SHEET METAL PRODUCTS WITH LESS WASTE

Manufacturers of goods fabricated from sheet metal may be able to cut down on waste and scrap thanks to an ultrasonic test developed by NIST working with universities and industry groups. Project collaborators are NIST, Iowa State University, Colorado School of Mines, and the Advanced Steel Processing and Products Research Center at the Colorado School of Mines. A major concern of manufacturers of cars, trucks, appliances, metal furniture, cans, and other items formed or stamped from steel and aluminum sheet is the problem of insufficient or variable formability. The new NIST method uses an electromagnetic-acoustic transducer (EMAT) to launch ultrasonic waves into the sheet metal to measure texture and formability. Ultrasonic measurements have shown a high degree of correlation with traditional measures of formability in the specimens of thin steel examined so far, and the tests have covered the range of formability characteristics typically found in industrial applications.

CONTACT: Fred McGehan (Boulder), (303) 497-3246
WHOLE-SYSTEM TEST METHODS DEVELOPED,
DEMONSTRATED

Staff of the Center for Electronics & Electrical Engineering's (CEEE) Electromagnetic Fields Division have developed and successfully demonstrated new test methods for the susceptibility of "whole systems" to electromagnetic interference. In this context "whole systems" refers to Army helicopters too large to fit into conventional microwave test facilities or for which testing is required under operational conditions that cannot be simulated in such facilities. The division-developed methodology and instrumentation have the additional advantage that they enable the testing of systems in the presence of existing electromagnetic noise and interference fields. The system to be tested is radiated with a broadband impulsive incident field, while internal electrical conductors previously determined to be critical are monitored by non-intrusive current or voltage sensors connected to a sampling oscilloscope. The trigger on the oscilloscope is synchronized with the transmitting pulse generator by a fiber optic link. Since the environmental noise is not synchronized with the trigger pulse sequence, the signal-to-noise ratio is improved by averaging the time-windowed samples. The resulting data can then be analyzed by any of several available signal-processing methods. In the future, this information is expected to allow the injection of currents at appropriate points on selected conductors as a means for simulating the effects of high-level fields.

CONTACT: Motohisa Kanda, (Boulder), (303) 497-5320
During the March/April time frame, hearings are conducted in Congress on the fate of NIST's initiatives. NCSL is an invited participant in this arena and will address these initiatives, the growing deficit in NIST's standards and calibration services, and the resulting impact on the Nation. Our NCSL Government Affairs Committee under the direction of the new chairperson, Mr. George Rice, and our immediate Past President, Mr. Gary Davidson, is highly active in communicating our standards and calibration service needs to NIST and responding to Congress' invitations for substantive testimony.

Comparing these two types of "initiatives", I'm left with the feeling that both were developed by a group of dedicated professionals, intent on doing a good job of defining and implementing needed changes on a macro scale. Both were put through deliberative processes where one received minor changes and was adopted; the other surely will be significantly altered as opposing and allied forces champion selected elements.

The development-to-implementation process for each initiative can be compared to a game - different rules, different magnitudes, but each requiring a lot of hard work to finish. While one game may be more appealing to some than the other, they both must be played out and each must have a significant level of active, responsive, and substantive participation to have any meaningful result. So let's participate!

**PARTICIPATION**

International measurement traceability is receiving renewed attention these days. Internationally accepted changes in the values of critical units and scales are coming up in 1990; potential trade barriers due to differing viewpoints on acceptable metrology systems and standards are being raised; DOD emphasis on traceability to primarily NIST standards is being brought up; increased use of accepted, fundamental physical constants for local standards are being pursued; disparity in the number of international reciprocal agreements on vital units is receiving scrutiny; and emphasis on documenting processes and paths to accepted standards is increasing.

These are but a few of the activities and issues that prompted NCSL to establish an ad hoc committee on International Measurement Traceability under the co-chairmanship of Mr. J. Graham Cameron (Department of Defence, Canada) and Dr. Klaus Jaeger (Lockheed Missiles and Space Co.). This committee is charged with developing an NCSL position paper that:

- Clarifies traceability on an international scale;
- Identifies when and to what extent measurement traceability to a national standards laboratory of one country should apply to measurements related to goods and services;
- Determines the meaning, need and extent of agreements or correlations of measurements between national laboratories and the means to initiate those agreements;
- Identifies the applicability of "intrinsic" and "consensus" standards;
- Addresses the realization of fundamental or natural, physical constants by laboratories.

If you're interested in hard work, fast-moving activities in the international arena, grab a spot on this team.

**IMPLEMENTATION**

Continuing on with last year's efforts, several NCSL Recommended Practices (RP) will either be updated or developed from scratch this year to reflect accepted methods of conducting segments of our metrology and calibration businesses. While I always urge participation in the development of these RP's I am now urging you to:

- Read each one over, as if it were part of a contract;
- Ask yourself if you subscribe to these practices, or more;
- Put up a sign in your laboratory showing which RP you meet or exceed;
- Provide feedback to the applicable NCSL committee on each RP.

Your immediate reward for this good deed is a gold star and, of course, internal satisfaction. Perhaps the next auditor will like your sign and the star. I am sure your company will like the "bottom line".

**ONE LAST ITEM - MIL HDBK-52B**

NCSL has received the coordination draft of Military Handbook 52B for review and comment. This handbook was developed to reflect the significant changes incorporated in Military Standard 45662A, issued last summer. By the time this issue of the Newsletter is published, NCSL's comments will have been provided to Mr. Dave Mednick of the Army Material Command for coordination by the Services. NCSL's activities in the development of the standard and handbook have contributed greatly to their utility and acceptance nationwide.

Del Caldwell, President
ANOTHER VIEWPOINT TO NCSL RP-8

The Value of a Good Reputation

At the 1987 NCSL Conference in Denver, Jim Ingram presented an entirely objective approach to purchasing instruments. As an ex-marketing manager for a laboratory instrument maker, I found Jim's approach was of more than passing interest. Recently, NCSL has published RP-8 which is a formalized version of Jim's prize-winning paper.

While the procedure recommended in the paper was admitted to be costly, it offered a "guarantee" that the proper equipment would be selected. Not only that, any two buyers following this same check list were expected to come up with the same choice of apparatus and supplier. It is important to eliminate personal preferences when procuring calibration equipment.

The question I raised at the conclusion of the paper was "What about the reputation of the supplier? How was this factored into the appraisal?" The vendor reputation is, Jim said, not to be a part of the selection process to avoid a subjective evaluation based on either personal prejudice or the rater's perceptions. The author professed firmly that one could not make an objective evaluation as to the probable performance of one's next purchase by including any consideration of the maker's reputation, no matter how well based on records kept of past performance.

This is, in my opinion, a controversial notion. I claim that a thorough analysis of the vendor's practices and even complete conformance of a sample to advertised specifications fails to guarantee that all future purchases of the same item will achieve precisely the same results. What are the odds? Let's look as some records.

In 1964, Charles White of AVCO presented a portion of his company's computerized procurement record involving thousands of instrument purchases. The number of failures of new instruments to meet advertised specifications was shocking - about 30%. It was equally interesting to note the wide disparity of failure rates among the various vendors carefully chosen by AVCO - from zero % on up.

In 1977, Clyde Moss reported on the experience of the AGMC for the Air Force. The period 1969-1970 saw a reject rate of 22.4% on 936 commercial, off-the-shelf type instruments. The 1975-1976 rate was 50% of 490 items; the 1977 rate was 16% on 788 items. Overall, the rate in the decade of the 70's was 26% - not appreciably better than White's report on his experience of the preceding ten years.

Mind you, this is on items "as received" - this does not include subsequent failures occurring within the warranty period.

Moss's conclusion was that the improvement he noticed between 1975-1976 and 1977 was still unsatisfactory and that all buyers would do well to take a closer look at the quality of new equipment. Has the well-publicized effort to approach "zero defects" altered this conclusion? Possibly. But it is more likely that the overall "as-received" rejection rate still lies somewhere between 25% and 30%, depending on rejection criteria.

However - it is unlikely that the as-received rejection rate is equally bad for each and every supplier. As White observed, some manufacturers are consistently better than others. The key word is "consistency".

One way toward improved adherence to advertised specifications is, as Moss pointed out, to continue a rigorous program of inspection and return of rejects. But, another is to follow White's lead and choose from those suppliers with consistently better records of performance. In other words, those with the best reputation.

Jim Ingram's highly analytical approach has genuine merit. It would be interesting to see reports similar to White's and Moss's for all incoming items from those companies following the Ingram sample evaluation procedure. In other words, will those companies getting the highest "Ingram" grade also have the fewest rejects? Or will it be those with the best history of meeting or exceeding specifications?

What is your opinion? What is your experience? Should you completely ignore the manufacturer's reputation in selecting instruments you buy? I think not.

H.L. Daneman

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AUSTRALIAN INSTRUMENTATION

The Australian Instrumentation and Measurement Conference (AIM-89) will be held in Adelaide (South Australia) November 14-16, 1989. The topics to be covered are of particular interest to instrument manufacturers and designers. They include:

- Sensor Developments
- Design of Instruments (Use of CAD)
- Economic Considerations of Measurement
- Impact of Regulation on Measurement
- Sensor System Architecture
- Systems Communications
- Applications Engineering Methodology
- Quality Aspects and Relevance of Measurement in Manufacturing
The Australian market for instrumentation systems has been excellent and U.S. manufacturers are encouraged to attend and exhibit - through their Australian agents and/or individually. As the American member of the Program Committee, I invite you to phone to see about presenting a paper. The audience will be very much an International one as was IMEKO.

Note also, that the famed Formula 1 Grand Prix will be run immediately preceding the conference and that the Conference hall is adjacent to the Barossa Valley vineyards and elegant casino. The Australian hospitality will be something to remember.

H.L. Daneman

CONTACT: The Conference Manager
AIM 89
(062) 70 6549 (Australia)
FAX (062) 73 1488

METRIC CONVERSION REVITALIZED: By R.C. Boles, Northrop
(From the GIDEP Newsletter)

The controversy surrounding metric conversion is heating up once again. On August 23, 1988, President Reagan signed the Omnibus Trade and Competitiveness Act of 1988. The bill contains an amendment to the Metric Conversion Act of 1975 and designates the Metric System as the "Preferred System of Weights and Measures" for the United States Trade and Commerce. The bill requires that each Federal Agency use the Metric System of Measurement in its procurements, grants, and other business related activities by the end of the fiscal year 1992. By offering products designed and built in metric units, the U.S. can increase its competitiveness in international markets and enhance the standardization of NATO forces.

One noteworthy example of metric implementation is the Army's Light Helicopter (LHX) Program. According to a recent U.S. Metric Association Newsletter article (Vol. 23 No. 6), the Army is replacing its Light Helicopter fleet with the new metrically designed LHX. The Army originally estimated that higher costs would result from using the Metric (SI) System in LHX design. On the contrary, experience has shown that the original estimates were exaggerated and cost savings are resulting.

The Aerospace Industry can expect to witness an increase in the number of new programs requiring metric usage as a result of this bill. The policies and procedures defined in DOD Directive 4120.18, DOD Metrication Program, are consistent with the Metric Conversion Act and its amendments and should serve to minimize the impact of metric conversion on the DOD and the Aerospace Industry. An Executive Order regarding metric transition is currently being drafted for Presidential approval.

As you are aware, GIDEP contains valuable metric-related papers, reports and procedures which can be used if/when your organization is required to convert to metric.

FIRST CALL FOR PAPERS FOR CPEM 90
11-14 June 1990/Ottawa, Canada

1990 will be the first year of a consistent international realization of the units of voltage and resistance. Therefore, the technical program of the 16th CPEM will be organized to reflect this fact.

The 1990 CPEM international conference on precision electromagnetic measurements and related fundamental constants, will be held June 11-14, 1990 in Ottawa, Canada. All papers concerned with precision electromagnetic measurements and related fundamental constants will be considered. Papers in the following fields are regarded as particularly appropriate for this conference:

- Direct current and low frequency
- Fundamental constants and special standards
- Time, time interval and frequency
- RF, microwaves and millimetre waves
- Lasers
- Cryoelectronics
- Dielectrics and antennas
- Advanced instrumentation including new sensors, automated instrumentation and novel measurement techniques

Original papers that have not been published previously are solicited. Authors should request an author's kit for the preparation of a summary, by returning the form attached to this call for papers. Since papers are selected on the basis of the summary (500-1000 words, and abstract, 50 words), the summary must describe clearly the new and significant results and their importance. The summaries of all accepted papers will be published in the meeting digest. Summaries must be forwarded no later than January 8, 1990 to the Conference Secretary.

CHAIRMAN/PRESIDENT

J. Vanier
Division of Physics/
Division de physique
National Research Council Canada/
Conseil national de recherches du Canada
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NEW PMA FELLOW

The Precision Measurements Association has conferred its first Fellow grade award, the highest the organization can bestow, on Phillip A. Painchaud, a founding member, former President and retired Executive Director.

Painchaud, of Brea, Calif., received the Fellow designation at the Measurement Science Conference in Anaheim. A plaque, specifying his status as Charter Life Fellow, was presented by PMA President David R. Workman.

Painchaud was one of the 12 founding members of PMA in 1958 and was its President in 1963-64. He spent more than 25 years as a director and officer of the Association, 10 years until his 1988 retirement as Executive Director. PMA is an international professional organization of metrologists and others involved and interested in the science of precision measurements.

A radio engineering graduate of Pacific State University, Painchaud spent 17 years at Northrop Corporation where he established metrology capability for the company's Nortronics Division. Later he was Director of Quality Assurance at E-H Laboratories in Oakland before forming a consulting business in Southern California. Painchaud was involved in the organization of the Measurement Science Conference and was its general chairman in 1977.

Painchaud is a senior member of the Institute of Electrical and Electronics Engineers and the Instrument Society of America, a member delegate to the National Conference of Standards Laboratories and a member of American Society for Quality Control, the National Conference of Weights and Measures and the Precision Measurement Society.

QUARTERLY REPORT - AEROSPACE INDUSTRIES ASSOCIATION (AIA) LIAISON [QAC WSC #1 - CALIBRATION & STANDARDS]

The AIA QAC Working SubCommittee #1 on Calibration and Measurement Standards has not met since June of 1987. Tentative plans are to meet somewhere on the east coast in the fall of this year.

The WSC #1 Chairman reports that there has been little activity other than discussion at the last semi-annual QAC meeting which will be continued at the next meeting planned for January 24th in San Diego. All subcommittee chairmen were invited to help discuss and plan the initiatives for the next couple of years.

The Threaded Fastener Quality subject seems to have reached an impasse. I am given the impression that the members of the committee agree that there may be a problem with fastener quality but the measurement techniques for the dimensional parameter which has been the major topic of discussion and disagreement is not the solution. That is, other parameter variables of material, temper, plating, etc. which are also potential causes of failure or poor quality, by have not been thoroughly documented or analyzed. The topics of fastener requirements specifications, overall qualification/inspection inadequacies, and the obscurity or availability of specific failure analysis reports are other concerns of WSC #1. In summary, the apparent situation at the moment is that the DOD has changed from the past practise of no receiving inspection to the present of dimensional inspection only at two locations with Johnson gaging systems. The adequacy of the Johnson's system traceability to national standards and as a total solution to threaded fastener quality problems has not been apparently established to anyone's satisfaction.

The WSC #1 Chairman recently indicated that he may pursue establishing a specific liaison with the Industrial Fastener Institute (IFI) and perhaps the NCSL on the threaded fastener issue. In the mean time, Alan Painter of Boeing Aerospace/Seattle Metrology has been designated as the liaison person from WSC #1 to the IFI. Alan commented that there was an IFI meeting on January 13th on the subject and there would be a joint IFI/AIA meeting on February 3rd, 1989 and he would keep me advised.

After the October NCSL BOD meeting, I forwarded a copy of my complete AIA WSC #1 file on the Threaded Fastener subject to R. Flyman per his request and to K. Armstrong so that the Secretariat could copy and provide to others that may request. To date I have not received any other inquiries or requests on the subject.

I will continue to routinely discuss with WSC #1 Chairman Luis Diaz.

Bob Willett, NCSL-AIA QAC WSC #1 Liaison

PMA LIAISON DELEGATE REPORT - JANUARY 1989

The first edition of the 1988 International Directory of Metrologists has been distributed to the PMA membership. The Directory lists the names of 279 Metrologists, their expertise, job function and business sector. The Directory also groups the names according to expertise and experience.
A PMA Board of Directors Meeting will be held at the Anaheim Marriott Hotel in Anaheim on January 25, 1989, preceding the Measurement Science Conference.

While there are a number of actions being worked upon within the Precision Measurements Association, none have been completed to report upon at this time.

Glenn E. Rasmussen, NCSL/PMA Liaison

A2LA LIAISON REPORT

The American Association for Laboratory Accreditation (A2LA) in conjunction with CEEM, a conference management firm, is sponsoring a "National Forum on Laboratory Accreditation" on 1-2 May 1989, at the Sheraton National Hotel, Arlington, Virginia. Prominent speakers from the legislative and executive branches of government as well as the private sector will address the importance of national accreditation and the challenge of implementing a national program. On the day after, a series of courses will be held which can be attended for an additional fee. One course will be on the topic: "Calibration in the Laboratory."

New leaders of the Association were elected for calendar year 1989. They are:

- Chet Grant, Chairman of the Board, from General Motors;
- Lee Rogers, Vice Chm. from Def. Quality & Standards Office;
- John Blair, Secretary, Du Pont;
- Kenneth Kun, Treasurer, Syracuse Research Corporation;
- Gladys Berchtold, Past Chairman, Standard Laboratories;

Earl Hess of Lancaster Laboratories and Carl Miller of Factory Mutual Research continue as Chairmen of the Accreditation Council and the Criteria Council respectively.

A major development effort to accredit metal fastener testing laboratories well underway with last year's support of the Defense Industrial Supply Center. Several laboratories have already applied. Accreditation in this area is expected to grow very rapidly in 1989/90.

The Association urges NCSL to consider development of a Recommended Practice for Metrology Laboratory Accreditation Criteria. We offer to prepare the first draft.

Peter S. Unger, Liaison A2LA

A MULTIPLE-CHOICE QUESTIONNAIRE FROM THE BOARD MEETING IN SANTA FE.

What is Pete England doing in this photo?

- Recruiting a new NCSL member
- Discussing metrology as it applies to the Anasazi
- Selling the benefits to calibrating tom-toms output frequency.
- Continuing to be active in NCSL, no matter what
- All of the above.

And why Pete is standing on his friend's toe?
WELCOME TO OUR NEW NCSL MEMBERS

REGION 1
Cambridge Research and Instrumentation, Inc.
Cambridge, MA 02139
Delegate: Clifford C. Hoyt
Polaroid Corp.
Cambridge, MA 02139
Delegate: Dennis C. Shepard
Philips Lighting Co.
Lynn, MA 01901
Delegate: Richard G. Collins
Woods Hole Oceanographic Woods Hole, MA 02543
Delegate: Richard E. Payne

REGION 2
Plessey Electronics Systems Corp.
Totowa, NJ 07512
Delegate: Charles Feldman
Hewlett-Packard
Avondale, PA 19311
Delegate: David E. Claypoole
Transcat Inc.
Rochester, NY 14606
Delegate: Jim Dunaw
Hewlett-Packard
Rockaway, NJ 07866
Delegate: Hank Kowalla

REGION 3
Harris Technical Services Corp.
Alexandria, VA 22314
Delegate: Delmer D. McLaughlin
Martin Marietta Energy Systems, Inc.
Oak Ridge, TN 37831
Delegate: Kenneth R. Armstrong
AT&T Material Management
Nashville, TN 37228
Delegate: Michael Dudley

REGION 4
Tellab Canbe Inc.
Fajardo, P.R.
Delegate: Felix J. Perez
Southern Marketing Association Inc.
Longwood, FL 32779
Delegate: Charles R. Snyder
Jacobs Co.
Ft. Lauderdale, FL 33316
Delegate: Krisly J. Jacobs
Baxter Edwards Division
Anasco, P.R.
Delegate: Benito Diaz
Bendix/ King
Ft. Lauderdale, FL 33310
Delegate: Tom Finneghan
Pro Battery, Inc.
Atlanta, GA 30340
Delegate: Neal A. Zucker

REGION 5
Scientific Columbus
Columbus, OH 43228
Delegate: David B. Shaw
Dynamic Technology, Inc.
Brighton, MI 48116
Delegate: Peter A. Szekeres
Entela, Inc.
Grand Rapids, MI 49508
Delegate: John Bardaville
United Testing Systems, Inc.
Akron, OH 44313
Delegate: Joseph D. Augustyn
Keithley Instruments, Inc.
Cleveland, OH 44139
Delegate: Edward T. Kifer

REGION 6
The Electro-Mechanics Co.
Austin, TX 78767
Delegate: John McClelland
Electrospace Systems, Inc.
Richardson, TX 75083
Delegate: Edwin W. Barker
International Assoc. of Machinists & Aerospace Workers, AFL-CIO
Ft. Worth, TX 76116
Delegate: B.D. Gould
Adolph Coors Co.
Golden, CO 80401
Delegate: Roger Casto
Hewlett-Packard
San Antonio, TX 78232
Delegate: Maxey R. Bernard
Emhart/PRC Systems Services
Ft. Hood, TX 76544
Delegate: Ben F. Karle
Raytheon Support Services
Aurora, CO 80040
Delegate: Patrick Fedorowicz
Colcom Inc.
Austin, TX 78717
Delegate: Manny Silva

REGION 7
Roger K. Sherman Co.
Los Altos, CA 94022
Delegate: Suzanne C. Sherman
FEI Microwave, Inc.
Sunnyvale, CA 94086
Delegate: Thomas P. Daniels
Hewlett-Packard
San Jose, CA 95131
Delegate: Bruno Benassai
<table>
<thead>
<tr>
<th>Company</th>
<th>City, State/Province</th>
<th>Delegate</th>
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<tr>
<td>Ford Aerospace Corp.</td>
<td>Palo Alto, CA 94303</td>
<td>Durward Ayre</td>
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<td>Ormond Inc.</td>
<td>Santa Fe Springs, CA</td>
<td>Harry Linden</td>
</tr>
<tr>
<td>Micro Metrology Service</td>
<td>Northridge, CA 91324</td>
<td>Allen Ganner</td>
</tr>
<tr>
<td>Bourns Inc.</td>
<td>Logan, UT 84321</td>
<td>Denia N. Hansen</td>
</tr>
<tr>
<td>Angen Inc.</td>
<td>Thousand Oaks, CA 91320</td>
<td>James H. Roberts</td>
</tr>
<tr>
<td>Dale-Dahl Associates South</td>
<td>Alhambra, CA 91801</td>
<td>Fred A. Dahl</td>
</tr>
<tr>
<td>Santa Fe Springs, CA</td>
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<tr>
<td>Boeing Commercial Airplanes-Fte</td>
<td>Seattle, WA 98188</td>
<td>Edward F. Greenp</td>
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<tr>
<td>Ortel International</td>
<td>Mississauga, Ontario L5K 1B3</td>
<td>Peter Bruyn</td>
</tr>
<tr>
<td>Duncan Instruments Canada</td>
<td>Weston, Ontario M9L 1Z8</td>
<td>Ivan S. Veg</td>
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<tr>
<td>Precision Measurements</td>
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<td>Boeing Commercial Airplanes-Fte</td>
<td>Seattle, WA 98188</td>
<td>Edward F. Greenp</td>
</tr>
<tr>
<td>Certelcom Laboratories Inc.</td>
<td>Ottawa, Ontario K1G 3N3</td>
<td>Ronald B. Dubnaj</td>
</tr>
<tr>
<td>Elbit Computers LTD</td>
<td>Haifa, Israel</td>
<td>Eigeles Michu</td>
</tr>
<tr>
<td>Ontario Hydro</td>
<td>Tiverton, Ontario NOG 2TO</td>
<td>Karel J. Ebenstreit</td>
</tr>
<tr>
<td>Ontario Hydro, Darlington NGS</td>
<td>Bowmanville, Ontario L1C 3Z8</td>
<td>Andy Walker</td>
</tr>
<tr>
<td>Ball Packaging Products Canada, Inc.</td>
<td>Niagara Falls, Ontario L2G 3R9</td>
<td>Sidney D. Shelton</td>
</tr>
<tr>
<td>簡単に計測計画研究所</td>
<td>Varennes, Quebec JOL 2PO</td>
<td>Christiane Roy</td>
</tr>
<tr>
<td>Honeywell Limited</td>
<td>Scarborough, Ontario M1P 2V9</td>
<td>Doug Thornton</td>
</tr>
<tr>
<td>TRW Space &amp; Defense</td>
<td>Redondo Beach, CA 90278</td>
<td></td>
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<tr>
<td>Loral Conic</td>
<td>San Diego, CA 92123</td>
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<tr>
<td>Loral Conic</td>
<td>San Diego, CA 92123</td>
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<tr>
<td>United States Lab, Inc.</td>
<td>Schaumburg, IL 60193</td>
<td>Ronald Stade</td>
</tr>
<tr>
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<td>Schaumburg, IL 60193</td>
<td>Ronald Stade</td>
</tr>
<tr>
<td>DCS Electric Co.</td>
<td>Chicago, IL 60626</td>
<td>Barry C. Brusco</td>
</tr>
<tr>
<td>United States Lab, Inc.</td>
<td>Minneapolis, MN 55409</td>
<td>Frank Dolezal</td>
</tr>
<tr>
<td>Marquett Electronics Inc.</td>
<td>Milwaukee, WI 53223</td>
<td>Gary Grabczyk</td>
</tr>
<tr>
<td>National Gage Calibration Inc.</td>
<td>Schaumburg, IL 60193</td>
<td>Ronald Stade</td>
</tr>
</tbody>
</table>
The fall 1988 Region 5 Indiana Section meeting was held on November 7 at the Datron/Wavetek facility, Indianapolis, Indiana. This meeting was the largest of any for this section, with 46 attendees.

The meeting began with an introduction of the new Indiana Section Coordinator Steven Stahley. Steve has replaced Burt Butts as section coordinator who recently retired from Detroit Gas Turbine. Burt was very instrumental in keeping the Indiana Section active and we wish him all the best in his retirement.

David Duff Director for Regions 2 and 5 provided charts and discussion of the Region 5 membership growth. David believes Region 5 has a great potential for growth and encouraged any interested nonmembers to contact Steve or Amos "Max" Green Region 5 Coordinator for membership information. David also encouraged section members to volunteer meeting facilities for future section meetings.

Max Green announced the 1989 NCSL National meeting being held in July in Denver. Max reminded the members of the call for paper and encouraged any interested to submit paper descriptions to the Conference Papers Committee.

Paul Stevenson, General Manager of Datron Instruments, gave a brief description of Datron which was followed by a film entitled "This is Datron" and Jim Walcut, General Manager of Wavetek RF, provided a description of the facility and invited everyone to the plant tour.

The first technical paper of the day was given by John Pickering, of Datron Instruments, entitled The Traceability of Modern Instrument Calibration Techniques. John discussed the evolution of the DC and LF measurement techniques due to the application of microprocessor technology in modern instrumentation. John also discussed the impact of this technology on traceability of calibration as defined by MIL-STD-45662. The paper was well received and provided a good topic for discussion. Copies of the paper were provided.

The second paper was presented by the past NCSL president Ed Nemeroff on the changes to MIL-STD-45662. Ed discussed the evolution of the changes to the standard and the role NCSL played in those changes. He also discussed in detail the changes and the impact of those changes to the metrology community. Copies of the revised standard were also provided.

Ed also discussed the changes of National Bureau of Standards to National Institute of Standards and Technology (NIST) and how these changes have effected their charter.

Many thanks to the host company Datron Instruments and Wavetek RF for an excellent day which included a complementary lunch and plant tour and to those who helped in the organization of the day's activities. Many thanks also extended to John and Ed for their presentations and those who raised issues and topics from the floor to make the discussions both interesting and informative.

Steven Stahley

ATTENDEES

Robert Simcox
Paul Osborne
Tim Pruitt
John Atkins
David Duff
Norm Bowen
Lindsay Smallidge
Bob Snow
Al Bearson
Mike Rowlands
Frank Capell
Tony Heath
Bruce Tiefert
John Ennis
Sherman Chancellor
Kenneth Tennessen
Ed Lyon
Woodrow Smith
Joseph Stache
Nancy Long
Forrest Neisson
Pete Ramsey
Jim Brandenburg
Marvin Wilderson
Charles Brown
Amos "Max" Green
Richard Chance
Edmund Taylor
Frank Irwin
Marvin Lamb
Loyd Roach
Bill Roberts
Michael Jacoby
Brad Grams

Naval Avionics Center
Eli Lilly & Co.
Cummins Electronics Co.
John Fluke Co.
John Fluke Co.
John Fluke Co.
Quaker Oats
Allison Transmissions
Allison Transmissions
Allison Transmissions
Allison Transmissions
Magnavox
Magnavox
Magnavox
Naval Weapons Support Center
Naval Weapons Support Center
Delco Electronics
Allison Gas Turbine
Allison Gas Turbine
GTE South
GTE South
Very interesting technical presentations

A Big THANKS to the Host Facility

Jan.11, 1989
Austron, Inc.
Austin, TX
Bob Trevino,
South Section Coordinator

With the help of the Naval Observatories Loran clock, the winter meeting of the Region 6 South Section started right on time for the 57 in attendance at Austron, Inc.'s very hospitable and newly built meeting room. Of the 57, 36 were test equipment users, 19 represented TE manufacturers and two were from the education field. Forty-two attendees were from NCSL member companies.

ACTIVITIES/SUBJECTS:

* Bob Ellis (Austron, Inc. (512) 251-2341) presented information on our host company.
Bob Willett (Rockwell Intl., NTSD, 214/996-7070) provided information on various NCSL committees, the National Conference, the Board of Directors meeting and RP-3.

Steve Koehn and Brian Abrams (3M, 512/984-3170) presented information and a demonstration on ElectroStatic Discharge. Mark Thornton (Mensor Corp., 512/396-4200) lead the discussion seeking answers to ESD problems in the calibration lab. Key points were: most facilities are okay, but don’t monitor enough; ESD program responsibilities are usually delegated too low; ESD bag properties are not well understood; most programs only cover some of the people who handle ESD sensitive devices; companies like 3M perform free ESD surveys.

Dr. Joe Simmons (NIST, 301/975-2005) discussed the proposed organization and responsibilities of NIST. While the NCSL continues to study and report industry’s needs and priorities, this information is used to justify funding for NIST. Under the newly passed Trade Bill and Competitive Act, NIST would organize to support Industrial Technology Services to fund small companies and create centers for the rapid commercialization of research technologies. Of course, NIST is still in the Standard Reference Materials and calibrations business. Feedback that the services were too slow was recognized as a problem, one that was being worked on. Dr. Simmons discussed the fee increase system and restated his need for feedback from the user community.

Ted Elms (H-P, 415/857-3121) presented Total Quality Control at Hewlett-Packard. Throughout his talk was the theme that quality yields productivity. His brief history and specific examples caught everyone’s attention. He offered that we ask who are our customers, what do they need, what are their measures and expectations, does our product meet them, what is our process to meet those needs and how do we correct that process for those needs? He emphasized companies must practice the principles of quality management throughout, customers define quality, stretch goals must be set and written annual plans must be living documents.

Also discussed were Section news items and concerns that will set the agenda for our next meeting. The MIL-STD-45662A has been out since August 1988 and many are looking for the issue of Handbook 52 which is due to be released in mid-February. DESC Form 695 (Appx. A to MIL-STD-976), the guide to translating MIL-STD 45662 to an internal company document, hasn’t been updated to the new release. John Lee, NCSL Government Affairs Committee Chairman, will look into this issue. Concern was raised for system vs. component tolerances for collective uncertainty and the 1990 volt, ohm and mass changes. Finally, my thanks to Judy Smith from Compaq Computer Corp., the new Section coordinator, as I take on the responsibilities of Region 6 coordinator. Bob Willett will continue to be involved with Region 6, but as an NCSL Director, takes on Region 8 as well.

My special thanks to Austron, Inc. for their facilities, lunch, refreshments, door prize, help and hospitality and to our topic discussion leaders. Your willingness to expend the effort insured the success of this meeting.

COMING EVENTS:

The next meeting of the Central (DFW) Section will be on April 5, 1989 at the Fluke facility.

The next meeting of the South Section will be on July 19, 1989 at the Mensor Corp. facility in San Marcos, TX.

ATTENDEES

<table>
<thead>
<tr>
<th>Name</th>
<th>Company or Organization</th>
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<tbody>
<tr>
<td>Bob Trevino</td>
<td>Texas Instruments-Aspin</td>
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<tr>
<td>Bruce Gould</td>
<td>IAM-AFC-CIO</td>
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<td>Ben Karle</td>
<td>Emhart/PRL Ft. Hood</td>
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<td>Steve Koehn</td>
<td>3M</td>
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<td>Jim Blue</td>
<td>Tektronix</td>
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<td>Don McKenzie</td>
<td>Tektronix</td>
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<tr>
<td>Howard Adams</td>
<td>Cal Labs</td>
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<tr>
<td>Harve Evans</td>
<td>IBM</td>
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<tr>
<td>Michael T. Tidwell</td>
<td>TI</td>
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<td>Les Mesnard</td>
<td>TI</td>
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<td>David Rosenkrantz</td>
<td>TI</td>
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<td>Win Day</td>
<td>H-P</td>
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<td>Ted Elms</td>
<td>IBM</td>
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<td>Ella L. Basley</td>
<td>NIST</td>
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<td>Joe D. Simmons</td>
<td>Rockwell Intl.</td>
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<td>Bob Willett</td>
<td>Colcom</td>
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<td>Manuel Silva</td>
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<td>Max Maxin</td>
<td>H-P</td>
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<td>George Brush</td>
<td>Elliott Moser &amp; Assoc.</td>
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<td>Intermedics Inc.</td>
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<td>Ed Surton</td>
<td>Intermedics Inc.</td>
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<td>Ed Gurton</td>
<td>Tracor Aerospace</td>
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<tr>
<td>Tommy Weaver</td>
<td>Airep Electronics</td>
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<tr>
<td>Jim Greenwood</td>
<td>John Fluke Mfg. Co., Inc.</td>
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<tr>
<td>Randy Wear</td>
<td>Rothe Development</td>
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<td>Dan Wilkerson</td>
<td>Southwest Research Inst.</td>
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<tr>
<td>Peter J. Stemmermann</td>
<td>IBM</td>
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<td>Jim Patterson</td>
<td>Texas Instruments, Inc.</td>
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<td>John Fabac</td>
<td>Texas Instruments, Inc.</td>
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<td>Don Jordan</td>
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<td>Cliff Bettinger</td>
<td>Southwest Research Inst.</td>
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<td>John Lidh</td>
<td>Motorola</td>
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<tr>
<td>Jesse R. Delgado</td>
<td>Oscilloscope Services</td>
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<td>Jim Good</td>
<td>John Fluke Mfg. Co., Inc.</td>
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<td>Dave Sanders</td>
<td>F1uke</td>
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<td>Johnnie L. Winters</td>
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<td>Bob Pister</td>
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<tr>
<td>Wayne Cummings</td>
<td>Compaq</td>
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<td>Terry McGee</td>
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The second NCSL Region 8, LA/San Fernando Section Workshop was held on November 3, 1988 at the North Ranch Country Club in Westlake Village, CA. Sixty-one NCSL delegates and guests representing 42 organizations were in attendance.

Dean Brungart, the outgoing coordinator for the section, chaired the morning sessions. Cathy Oaxaca of the Navy made a fine presentation about the Navy’s calibration interval system. The viewgraph presentation detailed the Navy’s model for setting and adjusting calibration intervals. If you’d like more detail or available handouts, Cathy can be reached at (714) 736-4251. Following Cathy, John Larson presented an outline of the Navy’s initial calibration interval determination process called MICIS, an acronym for Manufacturer’s Initial Calibration Interval System. This approach is primarily an engineering evaluation of design and component specifications which yields a very accurate measure of the appropriate calibration interval. John showed charts comparing a MICIS exercise with cal intervals determined by conventional methods. Variation ran from 0% to 35% depending on the device involved. Some NCSL members present questioned the overly-long intervals listed in John’s chart which was over five years for some instruments. More information can be acquired by contacting John at the same phone number as Ms. Oaxaca.

Tad Mukaihata, of Hughes, presented a “simplified” approach to cal interval analysis used at Hughes. His approach is to deal with each instrument on an individual basis, extending or reducing the cal interval as test equipment passes or fails. Tad emphasized that in order to meaningfully adjust intervals, no adjustments can be made unless a device fails calibration. If continual “tweaking” to nominal is done at each calibration, no mean time between failure can be determined. This MTBF is the critical element in this type of cal interval adjustment.

Dr. Joe Simmons of the National Institute of Standards and Technology, addressed the issue of the new charter for NIST (formerly NBS). Some members were concerned about measurement services becoming a poor stepchild in the shadow of the new NIST duties. Joe stressed the need for industrial organizations and the NCSL in particular to push for the services we need. The report was augmented by a handout outlining the reorganized NBS. Time pressure restricted feedback to NIST from attendees, but we have been given assurance that Dr. Simmons will be available to take our remarks, preferably in writing, at his office. It was a comfort to hear Joe struggle with the NBS/NIST acronyms as much as the rest of us.

A truly fine luncheon followed prepared by an award winning chef. Attendees could not recall a finer meal or a more comfortable meeting place than at the North Ranch Country Club. Rolf Schumacher documented the event in photographs, thanked Dean Brungart for his untiring efforts on founding the new section, and introduced Brian Conroy as the new LA/San Fernando section coordinator. Brian’s phone number is (818) 886-2211 X 2523.

The afternoon session began with a report from Chet Crane, Director of Region 8. Chet’s remarks were succinct. Feedback from the board of directors included election results (all directors are now from the West Coast) and a proposal to
find a more descriptive, inclusive name for NCSL. It was pointed out that at one time the conference was all the organization was about. Now NCSL plays a role in government, management, the biomedical industry, utilities, etc. A straw vote was taken to determine interest in locally elected vs. nationally elected directors. A strong affirmative response was observed.

The final session of the day was devoted to high vacuum traceability. John McGuire of MKS Instruments made an excellent presentation including basic vacuum terminology, instrumentation and traceability in the 10-2 to 10-6 Torr range. The session concluded with a demonstration of the Spinning Rotor Vacuum Gage which can provide calibration traceability in this parameter.

At the conclusion of the day, written evaluations were collected to facilitate even better meetings in the future. A summary of the responses (provided by only 30% of the attendees) is attached along with the attendance list.

Brian F. Conroy
Coordinator, LA/San Fernando Section

ATTENDEES

Accario, F.F. 
Baugh, Mike
Baxter, Martin
Beck, Paul
Belanger, Don
Bembej, Al
Brant, Dieter
Brungart, Dean
Chandy, Thomas
Chong, Paul P.
Clark, Jim
Conroy, Brian
Conte, Andrew A.
Crane, Chet
Doyle, James
Evans, Glen
Farhood, Virginia
Fenimore, Wa.
Ferguson, Bill
Gargyi, Julius
Gatea, Beth
Gilbo, Tom
Giles, James
Grayhek, Geo
Halford, Ken
Hamburg, Bob
Haymaker, C.L.
Hazarian, Emil
Henderson, Dennis

John, Jerry
Kennick, Mike
Kirkpatrick, Brent
Knorr, Bob
Larson, John
Lyon, Luckie
Marshall, C.E.
McGuire, John
Mid, Leonard
Mukaihata, Tadao
Murray, Mike
Nebiit, Robert S.
Oaxaca, Cathy
Plummer, Ron
Rasmussen, Glenn
Revilla, Joe
Richardson, Lynn
Rise, Bob
Rothleder, Joseph
Rudman, Herb
Schepple, Jim
Schumacher, Rolf
Simmons, Sue
Simmons, Dr. Joe
Simpson, Dick
Spanberger, Jim
Steffy, Leon E.
Steinert, Dieter
Stork, John
Stromquist, Bob
Taylor, Lisa
Teague, Ann
Wangerin, Ronald
Whiteaker, Britt

Northrop-Ventura Div.
Lockheed
Lockheed Aeronautical
Teledyne Systems
Litton Guidance and Control
U.S. Navy
Northrop Corp.
Eaton Corp.
MKS Instruments
Seaton Wilson
Hughes Aircraft Co.
PCO
The Aerospace Corp.
U.S. Navy
The Aerospace Corp.
Northrop-Ventura Div.
Rocketdyne
Delco
Litton Guidance
Calif. Dept of Food & Agr.
LakeShore Crytronics
MKS Instruments
Rockwell International
Sonatech
NIST
3M Photodyne Inc.
Teledyne Systems
Scope Tek.
Delco
Temperature Standards Lab
Elec. Stds. & Repair Serv.
Telego Inc.
Sonatech
Elect. Stds. & Repair Serv.
Gould/3DBM

L.A./Valley Section group on the golf course.
Reports from the Regions

Chet Crane, then Region 8 Director (foreground) and the participants listen attentively to an explanation of the Navy interval assignment method by Cathy Oaxaca while John Larson projects the visual aids.

Panel on calibration intervals with Tad Mukaihata, John Larson, and Cathy Oaxaca.

Breaks are an important part of Region 8's meetings to enable meeting participants to discuss special topics of interest in small groups.

The tenth San Diego Section meeting and workshop was held on December 7, 1988 at the San Diego Doubletree Hotel. Fifty-three (53) people were in attendance.

Randall Seefeldt called the meeting to order at 9:00 AM. After opening remarks and welcome, all present introduced themselves.

Dr. Howard Castrup, Science Applications International, was introduced as the first speaker. Dr. Castrup is the chairman of the NCSL committee on calibration intervals. This information on calibration intervals for test equipment and standards to promote improvements in the assessment and management of equipment measurement quality. The following points were discussed:

* Interval Committee responsibilities
* Establishment of Analytical Metrology Resources Library
* Quantitative link between end item quality/performance objectives and calibration interval
* Recommended Practice (RP) for calibration intervals in work and due in 1989
* Detailed discussion of RP

Randall Seefeldt then explained the NCSL/EMF Electronic Bulletin Board. He discussed the history of the Bulletin Board development, how it is used, areas information it can provide, and its future. The ones within the Bulletin Board are:

1. Electronic Mail
2. Posted Messages
3. File Transfer System
4. General Information

It was noted that the Bulletin Board will require more usage if existence is to continue past 1989. Information was made available to all attendees on technical requirements and point of contact to exercise the Bulletin Board.

After a short break, Randall Seefeldt reminded all of upcoming events of potential interest in 1989.

MSC 26-27 Jan.
IMTC 25-27 April

Dec. 7, 1988
Doubletree Hotel
San Diego
Randall Seefeldt
San Diego Section Coordinator

Rolf Schumacher, Rockwell, was then introduced and led discussion on National Institute of Standards and Technology (NIST). Much of the discussion centered on the revised charter for NIST. All were concerned the NIST is slow to “catch up” with technology. Specific examples were submitted and will be forwarded to NIST.

After traditional group picture and lunch, the meeting reconvened at 1:00 P.M.

Chet Crane, Teledyne, was introduced and gave the NCSL Board of Directors Report.

He gave an overview of the August conference and reminded all of upcoming conference in Denver, 10-14 July 1989. The following items were reported and/or discussed:

* Butler College and Metrology Degrees
* Responsibilities and status of all standing and Ad-Hoc committees

Rolf Schumacher acknowledged Richard Ringard, Ringard Metrology for his fine work as past San Diego Section Coordinator.

After a break, John Lee, Telogy, was introduced for discussions on MIL-STD 45662A.

John Lee led discussion by explanation of MIL-STD-45662A evolution. The NCSL has been instrumental in evolving the MIL-STD changes.

MIL Handbook 52A is in a process of rewrite and due by mid/end of 1989.

John Lee was happy to see DCAS in attendance because they are a vital link to success of MIL-STD-45662A.

After a detailed and excellent dissection of MIL-STD 45662A, various questions were answered and discussions carried the meeting to conclusion at 4:00 P.M.

A sincere thank you to all program speakers. I would also like to thank Julio Netto of Ringard Metrology for taking minutes of the meeting.

I especially would like to thank all attendees for your continued interest and support.

See you, May 17, 1989 at the next San Diego Section Meeting.

R.G. Seefeldt, San Diego Section Coordinator

**ATTENDEES**

Alexander, David L.
Anderson, Richard D.
Angel, Reynold J.
Arias, Don
Barger, Jimmy A.
Bowers, Bruce F.
Byrne, Jim
Castrup, Howard T.
Clark, Kevin P.
Corts, Dietrich
Cox, W.W.
Crane, Chet
Daymon, David C.
Dillard, Mark
Doyle, George W.
Doyle, William F.
Everson, Robbin
Fisher, Rolan H.
Harrison, Philip W.
Hausner, Herman J.
Johnson, Terry C.
Kennedy, Pete
Kohler, all
Koontz, W.A.
Lee, John
Libby, Rick G.
Lucas, C.
Mackinnon, Jim. B.
Merrill, Stephen R.
Moore, Robert C.
Morales, H.W.
McBride, W.J.
McCoy, Roger J.
Netto Jr., Julio L.
Parrish, Lavan
Rainville, Roger R.
Ringard, Richard O.
Rink, M.E.
Roberts, J.W.
Schott, William J.
Schumacker, Rolf
Seefeldt, Randy G.
Shilts, Gary
Shymon, Steve
Steffy, Leon E.
Stibbs, Tom
Tabler, J.H.
Thomson, John
Tong, C.J.
Tran, Tan C.
Van Winkle, Charles T.
Wheeler, J.C.
Winters, Al L.

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Valhalla Scientific Inc.
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Navy Prim. Stds Lab
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Plessey Electronic Systems
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Electro Rent
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Rohr Industries, Inc.
Navy Prim. Stds Lab
Watkins-Johnson Company
Navy Prim. Stds Lab
Sony
Daull, Inc.
Navy Prim. Stds Lab
Teledyne Ryan Elect.
Howard Castrop outlines the work of the Calibration Interval Committee of NCSL.

John Lee explains the salient points of the new MIL-STD-45662A.

Everybody is all smiles after a good lunch.

The 8th Annual Canadian Section Workshop and Symposium, was held at the Canadian Forces Base, Uplands Social Centre, Ottawa, Ontario. The meeting got underway with an introductory word of welcome from the Canadian Section Coordinator, Mr. Duane Brown.

Mr. Brown welcomed the attendees and introduced the guest speakers. Quantum Testing and Inspection, Burlington, Ontario was recognized for their generous contribution of coffee and pastries.

It was mentioned that the Education Committee has been very active since the last conference, meeting with various ministries within the federal and provincial governments.

The Education Committee has also met with the Occupational and Career Information Branch of Employment and Immigration in promoting metrology in an attempt to gain recognition and legitimacy for the occupation of a metrologist.

At the recent NCSL international meeting held in Washington the Education Committee received high praise from many U.S. organizations. Dr. Dennis Coffey of Standards Council of Canada had the opportunity to present the Canadian education initiative and to present our Metrology II slide presentation. It was recognized that Canada was playing a leading role in promoting metrology education.

The chairman introduced Mr. Ed Nemeroff, Datron Instruments, Florida, who spoke on a subject of great interest to members of NCSL: MIL-STD-45662A.

Mr. Nemeroff started his talk by relating a conversation he had recently wherein an individual said that quality is worth waiting for and quality takes time – Ed replied to that person that "Quality is on Time".

Mr. Nemeroff stated that MIL-Standard does not affect everyone, it is the United States Department of Defense document, but for those Canadian companies and organizations that are supplying product or services to the United States Department of Defense it will come into play. The U.S. MIL-STD-45662A is now an approved issued standard.

Mr. Nemeroff told the audience a little bit about how the document came to be and some of the difficulties encountered.

MIL-HDBK-52 was derived as a guideline for inspectors and auditors on how to interpret the specification. At this point
the NCSL committee asked for definitions of: calibration, consensus standard, measuring and test equipment, measurement standard, traceability.

Mr. Nemeroff pointed out that the cover page of the October 1988 issue of the NCSL Newsletter addresses the subject of MIL-STD-45662.

Organizations in the U.S. were encountering difficulties with multiple audits. Section 4.2.3 states that "Results of inspections or audits conducted within the last 12 months may be used by the government in determining contractor's compliance with this MIL-STD." This paragraph provides for potential reduction of multiple audits.

Following Mr. Nemeroff's talk the following questions was asked:

How does AQAP-6 differ from MIL-STD-45662?

The concept throughout the NATO world is that they have agreed on the AQAP specifications, however, Canada has a memorandum of understanding between Canada and the United States with respect to the acceptability of what is happening here in Canada to U.S. customers, that is the element that is under the jurisdiction of the Director General of Quality Assurance, the authority in Canada. The memorandum allows Canada to implement the AQAP document.

Mr. Cameron stated that there are organizations in Canada that corporately operate in accordance with MIL-STD-45662, particularly if it is an American based firm.

As an item of interest, Mr. Nemeroff mentioned that in every edition of the Newsletter there will be a column on the MIL-Standard, written by Dave Mednick, U.S. Army Material Command. Questions can be directed to him at (202) 274-8090.

"ORGANIZATION NAME CHANGE - NBS BECOMES NIST"

The attendees were advised that the name NBS has changed to NIST, "National Institute of Standards and Technology". The four areas of assignment for NBS are:

- Regional centres for the transfer of manufacturing technology
- Industrial extension services
- Advanced technology development Program
- National technology policy development.

INTERNATIONAL DIRECTOR'S COMMENTS - Graham Cameron

Mr. Graham Cameron, International Regional Director added his words of welcome to the group. The Canadian Section has 50 member organizations and it is part of the International Region which has 100 member organizations.

Recommended Practices. Mr. Cameron advised the attendees that NCSL produces Recommended Practices which are distributed to its membership. These usually take some time to be formed in committee then go out for critical comment to the Board. The Board formally votes on these and publication follows. The Calibration Procedures R.P. 3 is a major rewrite of a document released in 1968. The document was shortened, terminology updated, clarified and tailored to the function, multiple examples provided. It is intended to provide guidelines for manually operated general purpose measurement and test equipment, measurement test systems and measurement standards.

Another Recommended Practice is an Individual Equipment Evaluation Guide which grew very quickly out of NCSL '87 best paper, by Jim Ingram of Lockheed Missiles and Space, Sunnyvale, CA. The purpose was to provide an objective rating system to use in the evaluation of general purpose measurement and test equipment evaluations performed on different equipment by various groups within an organization. It covers design characteristics, service support features, equipment operating interface, documentation and calibration.

An RP is underway dealing with Calibration Interval Establishments and Adjustment.

Canadian Section. Mr. Cameron reported that a needs survey is required to determine Canadian requirement so educational institutions can plan their curricula. The situation was presented to the Board of Directors in January '87 and $3500 U.S. dollars have been earmarked to help with the survey. This amount is contingent upon Canadian funding taking place. It is anticipated that if the Ontario government can support the survey in Ontario the $3500 can be used to help determine needs in other provinces. Emphasis was again put on the need for participants to assist in updating the mailing list in the foyer and in supplying additional addresses. At the present time there are 28 member organizations in Ontario and 22 in other provinces.

"RECENT DEVELOPMENTS AT THE NATIONAL RESEARCH COUNCIL OF CANADA - DR. ALAN ROBERTSON"

Mr. Cameron introduced Dr. Alan Robertson, Executive Assistant to the Director of Laboratory for Basic Standards, Division of Physics, National Research Council Canada, Ottawa, Ontario.

Dr. Robertson began his presentation with a description of the three divisions of the Physics laboratory: Laboratory for Basic Standards; Laboratory For Microstructural Sciences and Laboratory For Photonics. The Basic Standards Laboratory is divided into five sections and its responsibility covers primary standards, measurement techniques, consultation, calibrations and calibration laboratory assessment service.
Dr. Robertson spoke about a new NRC service, "Calibration Laboratory Assessment Service" (CLAS) which is the subject of an agreement signed with the Standards Council of Canada and the National Research Council Canada which allows the two groups to cooperate in assessment of calibration laboratories. NRC will perform a technical evaluation of a laboratory's capability to do calibrations and will issue a certificate stating (in effect): Within the accredited uncertainty level, the laboratory is capable of making measurements that are equivalent to those that would be reported by NRC. SCC will perform a full accreditation of the organization and will issue a certificate which, inter alia, will include a direct reference to the NRC certificate.

NRC will have the technical assessment responsibilities and SCC the responsibilities of organizational base, physical resources, human resources, QC procedures, and independence. There are 10 steps in the accreditation procedure:

1. Submission of application.
2. Preliminary analysis by NRC and SCC.
3. Discussion with applicant and revision of application, if necessary.
4. Assembly of "MAP" package to test best measurement capability at selected levels.
5. Characterization of "MAP" package by NRC.
7. Analysis of results.
8. Site visit by NRC & SEC staff.
9. Judgement by NRC of:
   - How well applicant can measure intermediate levels.
   - How well applicant can handle less stable devices.
   - How well applicant can assess problems.
10. Issue of certificates.

Dr. Robertson addressed the subject of components of uncertainty: systematic uncertainty of NRC scale relative to "truth"; random uncertainty of NRC calibrations; uncertainty due to drift of standards (travel, etc.); uncertainty of accredited laboratory calibrations.

The preliminary cost estimates for CLAS are: salaries and overheads for four staff members $440,000; twenty laboratories with an average of 10 fields each; required annual fee $2200 per field.

Possible sources of subsidy are: NRC/SCC; federal government; provincial governments; industry associations and the recipient of subsidy could be NRC/SCC or accredited laboratories.

International Standards of Voltage, Resistance and Temperature which will take place in January 1990 and stated that documents will be provided at that time indicating changes.

Dr. Woods spoke about voltage and said that the Josephson volt provides a continuous voltage of zero output resistance and is independent of time, temperature, materials and bias current. A Josephson junction consists of two weakly coupled superconductors.

Dr. Woods then spoke about resistance and the calculable capacitor and described the Quantum Hall effect as a resistance standard.

In speaking about temperature the shortcomings of the International Practical Temperature Scale (IPTS.68) were addressed.

Dr. Woods mentioned that at the present time several different values of voltage and resistance are used internationally. The new values of voltage and resistance are used internationally. The system will ensure that all major countries use the same system. As a result of the change, the measurement world will benefit from the following characteristics: international universality; higher achievable accuracy; stability; internal consistency; simplicity and robustness; and more accurate relationship to the fundamental constants.

It was also stated that voltage and resistance calibration will be quoted in the SI units and not in laboratory units following the change.

EDUCATION COMMITTEE PART 1 – Dr. Dennis Coffey

Dr. Dennis Coffey, Standards Council of Canada, Ottawa, Ontario provided the audience with background information on how the slide presentation Metrology I came about. Dr. Coffey went on to say that it was decided that an audio-visual was needed which could be shown to academic institutions and students as a result Metrology II came to birth and is a good communication tool. Both modules are available from the Canadian Section Secretariat, Mrs. Marilyn Ross.

The purpose of the film is to raise the consciousness of metrology as a discipline and to show the need for metrology education.

Dr. Coffey stated that metrology activities surround us everywhere. They help us to describe, predict, communicate, define, control and react in dealing with the physical universe.

Metrology is the science of weights and measures. It is the process whereby the question how much/how many is answered.
Dr. Coffey mentioned that the cartoon slides which he was using will be used to produce a poster which may be used as a source of revenue for the Canadian NCSL conference.

Slides cover time, weight, height, temperature, volume, length, mass and pressure, electricity, and time.

Dr. Coffey reported on the educational initiatives at the 1988 NCSL conference held in Washington, DC. It was reported that Metrology II was shown at the international delegates meeting on August 15th. and the training management seminar. The response from the international delegates was positive. A concerned quote was provided from the Education Committee chairperson "The metrology profession still needs to be legitimized. We lack political visibility. Unless there are jobs, money and prestige the kids won't sign up for metrology." It was suggested that Dr. Coffey contact Dr. Ron Walker at Portsmouth Polytechnic in the United Kingdom.

**Automatic 'True' Self Calibration Techniques Made Simple Using the Binary Principle - Dr. Andy Dunn**

Mr. Graham Cameron introduced Dr. Andy Dunn, Measurements International Limited, Prescott, Ontario. Dr. Dunn began his presentation with the question “What is meant by self-calibration?” Dr. Dunn stated that there are six acceptable types of designated reference standards in the latest definition for “traceability” of measurements being considered in Canada. They are:

1. National standards held or accepted by the National Research Council of Canada;
2. National standards of other countries whose measurement values are correlated with international standards (e.g., Bureau international des poids et mesures) or with Canadian national standards;
3. Accepted values of natural physical constants;
4. Ratio type of self-calibration techniques;
5. Consensus measurement standards;

Dr. Dunn chose to address the ratio type of self-calibration techniques.

Dr. Dunn’s presentation follows:

After many years of painstaking experiences with the calibration of instruments of all kinds, a decade or two ago we encountered a whole new breed of instrument, the “smart” instrument, in which a number of things were expected to happen.

Initially, there were the automatic checking devices which ran a quick check to indicate that all the elements appeared to be working as expected.

Then there were the instruments in which were found a form of automatic checking against artifact standards or reference parameters connected to the front panel.

This was quickly followed by instruments in which there was automatic checking against artifact standards or reference parameters connected to the front panel.

This was quickly followed by instruments in which there was automatic checking in terms of reference artifacts built into the instrument itself, with storage of the “calibration” data in internal memory. In use, the instrument looks up this memory appropriate times before presenting the user with a “corrected measurement” reading. This mode of checking is frequently called automatic calibration, Autocalibration or AUTOCAL.

It does require that an artifact package be calibrated against some other source of reference measurement, and it does nothing about verifying the linearity of the indication of the instrument, although may correlate the various ranges of an instrument, such as 1V, 10V, 100V, etc. Within its limitations, it is a big improvement over the previous situation where one periodically calibrated an instrument by manual methods, or one hoped or trusted that the basic instrument and all its sensitive components remained stable with time, temperature, relative humidity, transportation, etc. Incidentally, do you remember the occasional check or linearity against a reference “calibrator” – who checked the linearity of the calibrator, and how often?

It is relatively recent that the ratio type of measurements of self-calibration has been fully accepted as a legitimate method of calibration that does not require national laboratory verification. At NRCC, the Electricity Section has been practicing the ratio type of self-calibration for at least 30 years with resistive dc potentiometers and Kelvin-Varley Voltage Dividers, and for at least 20 years with ac Inductive Voltage Dividers. It was even simpler with the dc current comparator ratio devices in the many years they have been in use. Then there is a particular style of Volt Ratio Box designed over 40 years ago that was also fully calibrated by self-calibration ratio techniques.

The characteristic of all of these techniques was a verification of the relative ratios of the steps of sub-division of an instrument, that is, the linearity of the sub-divisions of the instrument.

With the advent of "smart" instruments it became quite reasonable to do all the measurements automatically with an immense saving in time and expense, thus providing increased productivity or, alternatively, greater confidence in the measurements made with the instrument which implies improved accuracy (or decreased uncertainty) in the measurements made. There are, however, relatively few of these automated self-calibrating instruments on the market as yet, but they are coming.
It is necessary to look very carefully at other descriptions of self-calibration techniques to be certain of what they are actually doing. In metrology, precision in language is as important as precision in measurement.

**PRESENTATION OF WILLIAM A. WILDHACK MEDALLION**

Following Dr. Dunn’s presentation Mr. Nemeroff spoke about the William A. Wildhack Award. The highest award given out by NCSL. The winner this year was Dr. David Braudaway. In the early 60’s William Wildhack was the man instrumental in forming the NCSL and the award is in honor of Bill. In the past the award carried a plaque and an honorarium of $1000. This year for the first time the recipient was awarded a medallion. Mr. Nemeroff stated that the Board of Directors had agreed to honor all the past recipients of the Wildhack award with a copy of the medallion. Dr. Dunn was called up to the podium to receive a medallion as winner of the award in 1984.

**CALIBRATION DATA: ITS ACQUISITION AND MANAGEMENT – Panel**

Mr. Les Peer, member for Canada Centre for Inland Waters, Environment Canada, Burlington, Ontario, chaired a panel of participants who represent a cross section of mechanical, physical and electrical calibration fields using fully manual to fully automated techniques in acquiring and managing calibration data.

**THURSDAY, NOVEMBER 10, 1988**

Mr. Brown welcomed everyone to the conference particularly Mr. Bill Johnson of Eastman Kodak, Rochester, N.Y. and spoke a little about the metrology efforts at Eastman.

**PLAN TO REGISTER DEFINITION FOR METROLOGISTS**

Mr. Brown told the attendees that he had met with Employment and Immigration Canada. The definition which he came up with following that meeting follows and attendees are asked to critique it and return their comments to him at Measurements International, P.O. Box 2359, Prescott, Ontario, KOB 1TO.

**DEFINITION OF A METROLOGIST**

**METROLOGIST (PROFESS & KIN)**

Develops and evaluates calibration systems that measure characteristics of objects, substances, or phenomena, such as length, mass, time, temperature, electric current, luminous intensity and derived units of physical or chemical measure. Identifies magnitude of error sources contributing to uncertainty of results to determine reliability of measurement process in quantative terms. Redesigns or adjusts measurement capability to minimize uncertainties. Develops calibration methods and techniques based on principles of measurement science, technical analysis of measurement problems, and accuracy and precision requirements. Directs engineering, quality, and laboratory personnel in design, manufacture, evaluation, and calibration of measurement standards, instruments and test systems to ensure selection of approved instrumentation. Advises on methods of resolving measurement problems and exchanges information with other metrology personnel through participation in government and industrial standardization committees and professional societies.

**"SELFCAL – THE NEW GENERATION" – John Pickering**

Mr. Brian Wilson from Interfax introduced Mr. John Pickering, Technical Director, Datron Instruments Ltd., Norwich, England who gave an interesting presentation on “Autocal”. Mr. Pickering stated that in automated calibration micro processor techniques can lead to a triple win: ease of calibration; higher precision, and lower cost. In speaking about traceable calibration he said that traceable calibration is where calibration is transferred via a transfer measurement from a traceability calibration artifact or an absolute standard with all the transfer uncertainties accounted for, verifiable and included in the final calibration uncertainty. Other definitions used by Mr. Pickering follow. Transfer Measurement. Transfer measurement is one where the already established calibration is transferred to another with known transfer uncertainties. The transfer measurement is usually a null measurement. Ratio Techniques depend on null measurements. The ratio 1/2 is set precisely, theoretically to noise levels. Definition of Calibration. The comparison of measurement standard of unknown accuracy to a measurement standard of known accuracy in order to detect, correlate, report or eliminate by adjustment any variation in the accuracy of the instrument being compared.

Autocal calibration terms are: Autocal I (autocal external); Autocal II (internal calibration, self calibration) and Autocal III (artifact calibration and internal). It was noted that Autocal III is dependent upon Autocal II.

Advantages and Disadvantages of the three follow:

**Autocal I – Advantages**

100% traceable calibration.
Ultra low transfer error.
High speed and low cost.
Programmable.

**Disadvantages**

Needs full set of calibration standards.

**Autocal II – Advantages**

Minimizes manufacturing cost.
Major increase user confidence.
Offers opportunity for reduced external calibration. Useful as performance enhancement.

Disadvantages

- Not 100% traceable.
- Involves complex internal switching with multiple transfers.
- Repeatability on extreme ranges is compromised.
- Usually depends on "inherently linear" components working at low voltage.
- Internal measurement paths are different from external.
- While useful as performance enhancement it may be dangerous when necessary to achieve all specifications.
- May require frequent Autocal II to maintain specs.

Autocal III – Advantages

- Low cost frequent partial transfers to external standards.
- May give sufficient confidence to extend Autocal I interval.

Disadvantages

- Totally dependent on Autocal II.
- Multiple transfers necessary for extreme ranges.
- Non-adjustable systematic transfer errors where Autocal I not available.
- Does not provide means for verification of other ranges and AC functions. This clearly breaks the cal chain.

Mr. Pickering stated that the philosophy of Autocal is "A method of enhancing performance" or "A method that is essential to achieving performance".

NOTE OF INTEREST CONCERNING OIML DOCUMENT

It was mentioned that there is an OIML document "Planning of Metrology and Testing Laboratories" available from the Standards Council of Canada which is similar to NCSL Recommended Practice. The toll free number is: 1-800-267-8220. OIML is the International Organization for Legal Metrology.

NEW CALIBRATION TECHNIQUES – Frank Capell

Mr. Rick Weller of Fluke Electronics, Ottawa, Ontario introduced the next speaker, Mr. Frank Capell, Product Manager of John Fluke Manufacturing, Everett, Washington.

Mr. Capell gave an indepth, interesting presentation on "New Calibration Techniques and Support", enhanced by "Statistical Process Control in Automated Calibration Systems".

Mr. Capell asked the question "Why calibrate?" - Calibration improves performance; increases reliability; allows compatibility of components and reduces costly overheads.

Mr. Capell with the aid of audio visuals spoke about the improvement of accuracy from 1850 to 1980 (1% to 0.001%).

and asked "What is the most important word in metrology"? - "Traceability". Mr. Capell touched on manual accuracy enhancement of calibrators and automated accuracy enhancement of calibrators. It was pointed out that the multimeter workload is changing, producing higher accuracy and on-site calibration and is sensitive to support costs. Limitations of traditional calibration were shown as: inadequate accuracy, limited environment and complex to calibrate. Mr. Capell then spoke about changes in calibration techniques from 1975 to 1987. Fluke Model 8500A was the world's first microprocessor controlled software calibrated DMM. The DMM demonstrated that micro-processor based, automated calibration capabilities could be self-contained in an instrument.

Mr. Capell mentioned first generation calibrators and the new generation of software calibrated instruments. The audiovisual aids showed the use of built in references and check standards in a calibrator. Part 1 showed characteristics required for implementation: full covers on calibration; limited complexity for the operator; minimum transfer errors and high tolerance to temperature variation. Part 2 showed the principles of technique: built in highly stable references; allows the operator to characterize internal references.

In the second portion of Mr. Capell's presentation, he asked "Why bother to calibrate?" If calibration is done correctly it provides improved knowledge of the performance of the calibrator. It also allows the company to increase their reliability of their manufacturing process and reduces the overhead of having to rework things that weren't built right in the first place. Therefore, one of the advantages of calibration is that it can be used to improve the quality of the item that is being produced and this is particularly true in process metrology where there is feedback from the end item back into the calibration process to make sure that the end objective of the calibration process is under control and that information is being fed back through the traceability chain.

Mr. Capell stated that the new calibrator design reference amplifier is the heart of the calibrator. In speaking about traceability it was stated that traceability requires that the internal system be verified. Impact on confidence - internal metrology enhances consistency; internal metrology provides data and allows checks.

The third section of Mr. Capell's presentation dealt with Data Analysis; "What is it?" and "How does it relate to specs?" The attendees were advised that a PC can perform a linear regression and Mr. Capell enlarged on this.

In speaking about False Test Decisions Mr. Capell stated that the method of reducing false test decisions is to: perform regressions on regression data; predict calibrator performance; calibrate to the predicted specs. It was noted that the SPC lets you confirm that your calibrator is in tolerance. Mr. Capell then spoke about the square root of time curve specs.
March 3, 1989
ESL
Sunnyvale, CA
Bard Dunkelberger,
Coordinator, Section 7

Region 7 met at Lockheed Missiles & Space Company in Sunnyvale, CA on 2 March 1989 with 46 individuals representing 27 different organizations. Our host was Jim Ingram, Lockheed.

The meeting agenda included NCSL BOD report, report on MIL-HDBK-52, four special topics and a tour of the Lockheed Metrology labs.

After starting a little late, I welcomed the attendees and presented an overview of the days activities. I then introduced Dr. Klaus Jaeger who welcomed the members and guests to Lockheed.

Jim Ingram was then introduced and he gave the BOD report and clarified the NCSL committee membership and their needs. Jim then reviewed the MIL-HDBK-52 progress and emphasized that it was nearly done to be reviewed about 15 April 1989 by NCSL. He further suggested the membership call Dave Mednick if we did have problems in the interim of the MIL-HDBK release. Questions from the floor showed concern that the NCSL committee, and the membership, needed sufficient time for this review as DCAS has already started its audits to MIL-STD-45662A. Jim stated that time seemed to be the essence and he would not assure the full membership would have the chance to review and respond, but he would convey this concern to George Rice, the Government Affairs Chairman.

Tony Martinich, Instrument Support Services, Inc., Regional Manager, gave a very interesting talk on "The Elements for Metrology as a Profitable and Viable Business." Tony showed the importance to Quality, goals of a company vs type of business. He also showed that the goals could not be taken lightly and the importance of planning and communication to be a success.

Dr. Klaus Jaeger, Lockheed Msl. & Sp. Co., reviewed each element of the Volt, Resistance, Ampere, Power, Capacitance, Mass, and Temperature. Klaus strongly warned the attendees not to take these changes lightly and to make sure that they contact Mr. Norm Bolecki for Voltage, Resistance, Capacitance, Current, and Power, or Dr. Richard Davis for Mass, or Dr. B. W. Mangum for Temperature for detailed info and to put on their mailing list. He further described his plans for Lockheed and their customers, and distributed a handout that briefly described the parameter changes and adjustments. There were no temperature changes announced at this time. He again warned everyone, January 1, 1990, is close and we should be planning. Klaus has recommended that NCSL issue a label for everyone to use, to be consistent, that can be applied to equipment where these changes are made. He would follow up on this issue.

Klaus then spent some time in describing his committee needs and their goals. He further requested assistance for members to serve on the "MAP" programs.

Bob McGrath, President of McGrath RentCorp, with his assistant Nancy Vogl, presented a sample of their Metrology Data Base. He presented a few screens and explained their function and relationship to his rental business supporting his customers. Bob fielded questions from the floor about out-of-tolerance, traceability, and intervals.

Kevin Clark, President, Valhalla Scientific, presented their new technology for the new generation of calibrators. He showed the new design features with expanded and reliable built-in that gave long term MTBF and promoted long term re-calibration intervals.

He explained the attitude towards the self-calibration check and the external calibration. Kevin then took questions from the floor that included cold start use, re-calibration intervals, calibration equipment required to verify the tester, options, ESD protection, shock & vibration viability, and procedures for test and support.

Once again, my thanks to our host, Jim Ingram, and my personal thanks to each of the presenters and the attendees for their contributions to this meeting.

At the end of the afternoon we were conducted on a tour of the Lockheed Metrology facilities.

ATTENDEES

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Warning to Roster Personnel!
If you don't send us a picture of yourself, we may take action unilaterally.
The editors
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