INTERNATIONAL ACTIVITIES

Seminars and Meetings in Southeast Asia

In early March, I participated in two well-attended seminars in Singapore and Kuala Lumpur, Malaysia. Drawing on the experiences of NCSL colleagues and several Canadian associates, I presented a talk covering the importance of good measurement systems in obtaining and maintaining product acceptance in today’s dynamic market place. Presentations were made by key personnel from the Singapore Institute of Standards and Industrial Research and the Standards and Industrial Research Institute of Malaysia and Bill Bruce of HP Loveland, Colorado.

During a subsequent visit to the Hong Kong Government Standards and Calibration Laboratory, arrangements were made for Tony Rocha to become the NCSL liaison delegate to the Asia/Pacific Metrology Programme (APMP).

Visits to these points in the Pacific Rim permitted discussions with several member delegates interested in establishing NCSL-sectional activity and provided a first hand opportunity to feel the tempo of metrological development and interest in this area.

My presentation brought to these audiences information on NCSL and its valuable products and services, such as recommended practices and the current work of the International Measurement Coordination Committee. Several copies of our key documents were well examined by audiences during “tea breaks.”

Participation by NCSL persons in activities such as these and Metrologia '90 in Mexico and improved support to member organizations in the 26 countries where we have member organizations is central to my continuing activity to strengthen NCSL as a vital and valuable international organization.

A RATHER SPECIAL BOARD MEETING

A Fresh Look at Our Organization and Election Process

During the February Board, Bill Simmons led open discussions on the possibility of restructuring the NCSL organization and election process. During these sessions and small group discussions, the board tried to determine if there were real problems or were we discussing “situations.”

The Questionnaire

Bill has distributed the initial draft of an important questionnaire to directors/board members/interested parties. Following their input and finalization it will be used at all our regional and sectional meetings, to obtain specific information from

(Continued on page 77)
EDITOR'S MESSAGE

NOW IS THE TIME FOR NETWORKING

I learned just after the January issue left the printer that several friends and Member Delegates were laid off in Reductions-in-Force at their companies. From the mood of some attendees I talked to at the Measurement Science Conference, that won't be the last.

I belong to another Industry Association that is seeing the same effects and has started some member-networking to be sure that their members have a better chance of learning about whatever positions may be open in our industry. To that end, here are several immediate things we can do:

VP Jim Ingram and NCSL Business Manager Wilbur Anson have been running a resume-posting job exchange on the NCSL Electronic Bulletin Board at the NCSL office in Boulder. It is now immediately available for metrology engineers and managers. So if you have an opening, be sure to call up the NCSL Bulletin Board. See page 21 for more of the story.

NEW FORMAT FOR BOARD MINUTES

Some of you more-observant readers will have noticed in issues past, that there is always some redundancy between the Minutes from the Board meeting and the committee, Liaison or Regional News chapters. The reason, of course, is that written reports to the Board often get summarized and entered into the Secretary's minutes. And the entire report detail goes directly into that chapter. Usually, then, I don't have the time or patience to weed out the duplication.

Henceforth, the Board minutes won't contain such reports. If there is material from a VP with information on their committees' activities, I will most likely run that information in the committee News chapter. That should both trim up the minutes as well as present all appropriate information in the right place.

(Continued on page 7)
HIGHLIGHTS OF THE NCSL BOARD MEETING

Sheraton Hotel, Santa Barbara, California
February 4-6, 1991

WELCOME, INTRODUCTIONS & ANNOUNCEMENTS - Bill Simmons

A quorum being present, the meeting of the Board of Directors of the National Conference of Standards Laboratories, Inc. was called to order by the Immediate Past President Bill Simmons.

Bill Simmons turned over the Presidency to Graham Cameron and presented him with the Presidential Gavel.

Graham Cameron led a moment of silence for our brave men and women serving in the Middle East.

Graham Cameron announced that two NCSL members won awards at this year's Measurement Science Conference. Gary Davidson won the Andrew J. Woodington Award and Brian Conway won the Best Paper Award.

PRESIDENT'S REPORT - Bill Simmons

Bill Simmons summarized his fourth quarter 1990 report.

EXECUTIVE VICE PRESIDENT'S REPORT - Graham Cameron

Graham Cameron summarized his fourth quarter 1990 report.

SECRETARY'S REPORT - Bill Doyle

Bill Doyle summarized his fourth quarter 1990 report.

TREASURER’S REPORT - Tom McGovney

Tom McGovney summarized his fourth quarter 1990 report.

It was announced that the 1990 Conference produced a $27,000.00 surplus.

Tom McGovney reviewed the 1991 proposed budget line item by line item with the Board providing inputs as required. (See page for NCSL 1991 Budget).

NIST REPRESENTATIVE'S REPORT - Joe Simmon

Joe Simmons summarized his fourth quarter 1990 report.

Joe Simmons informed the Board that Presidential budget for NIST went to congress today for review.

V.P. OPERATIONS & MARKETING REPORT - Tony Anderson

Tony Anderson began a discussion over the proposed Membership Dues Guideline. It was decided that Gary Davidson should publish the guideline as submitted.

PUBLICITY - Hal Stitt

Hal Stitt announced his committee structure and activities to date. The NCSL articles in the Test & Measurement World will continue.

NCSL NEWSLETTER - John Minck

A discussion arose over listing positions in the newsletter for anyone who is unemployed. It was determined that the bulletin board is to be used for this purpose and Wilbur Anson will list names on the bulletin board from call-ins. A discussion arose over having advertising in the newsletter. It was the general consensus that the newsletter is not to be used for advertising.

V.P. CALIBRATION SYSTEMS MANAGEMENT REPORT - Bob Smith

A motion was made by Bob Smith to accept the Calibration Laboratory Managers Guidebook as submitted. Seconded by Jim Ingram. Discussion: None. Motion carries.
LABORATORY FACILITIES COMMITTEE - Walt Fitzgerald

Walt Fitzgerald informed the Board on the current status of RP97 and announced that the draft report should be available by August 1991. Walt Fitzgerald summarized the remainder of this report.

CALIBRATION SYSTEMS COMMITTEE - Dennis Pinnecker

It was announced that Phil McBury was appointed by Woody Tramel to chair this committee. Dennis Pinnecker presented the results of the recent salary survey to the board for review. He requested suggested formats for this report for inclusion into the newsletter.

CALIBRATION INTERVAL COMMITTEE - Frank Butz

The Calibration Interval Recommended Practice will be reorganized for clarification in the future. This committee desires a panel session at the 1991 Conference and desires to develop other Recommended Practices on uncertainty analysis and measurement risks.

V.P. MEAS. SCIENCE & TECHNOLOGY REPORT - Klaus Jaeger

Klaus Jaeger summarized his fourth quarter 1990 report.

A discussion arose over the operation of the round robins and the methods used to conduct them.

AUTOMATIC TEST & CALIBRATION COMMITTEE - Dave Nebel

A discussion arose over the need to continue this committee. The original purpose of this committee has been accomplished and future directions are required.

NATIONAL MEAS. REQUIREMENTS COMMITTEE - Laurie Baker

Klaus Jaeger informed the Board that this committee hopes to have the NMRC Report for the Board to review at the next Board meeting. The NMRC Report will be published every three years instead of every two years.

INTRINSIC & DERIVED STANDARDS COMMITTEE - Richard Pettit

The status of the practices for the Triple Point of Water and the Josephson Junction were reviewed.

V.P. INDUSTRIAL PROGRAMS REPORT - Jim Ingram

Jim Ingram summarized his fourth quarter 1990 report.

Jim Ingram informed the board on the current status of the Metrology Program being developed for California State University, San Bernardino.

PETROLEUM INDUSTRY METROLOGY COMMITTEE - Sue Griston

Suzanne Griston informed the Board that she is conducting general seminars within the Petro Community. The next scheduled meeting of this committee is scheduled for May 1991 in Bakersfield. Graham Cameron requested that Susan Griston furnish him with additional information pertaining to her scheduled trip to Singapore.

V.P. EDUCATION & TRAINING REPORT - Bob Willett

Bob Willett summarized his fourth quarter report for 1990.

Bob Willett requested that persons be found within the regions/sections to serve as liaisons to the various Education and Training Committees. An action item was given to all directors to actively participate in finding and identifying individuals within the regions to serve as liaisons to the Education and Training Committees. There should not be more than one representative per Section. The contact names and telephone numbers to be furnished to Bob Willett.

TRAINING INFORMATION & DIRECTORY COMMITTEE - Dave Lorenzen

Dave Lorenzen summarized the activities of his committee for the fourth quarter of 1990 and requested feedback on how well his committee is performing.

GLOSSARY COMMITTEE - Woody Salyer

Report summarized V.P. Education & Training Report.

General comments were made in regards to the direction that this committee should head.

1992 ANNUAL CONFERENCE SITE SELECTION - Randy Seefeldt

Randy Seefeldt informed the Board that the three locations being considered for the 1993 Conference are St. Louis, Chicago, and Dallas.

1991 PROGRAMS - Dennis Pinnecker

There will be a four track program this year due to the EMP being integrated into the annual conference. Dennis Pinnecker informed the Board that there will be complementary registration for all speakers presenting papers at
the conference. There is a broad spectrum of papers for this year’s conference therefore appealing to the attendees.

1991 EXHIBITS - Dean Brungart

Dean Brungart recommended to increase the number of free registrations for exhibitors from one to two per booth and one per table. This will result in an $11,000.00 expense.

1991 ARRANGEMENTS - Dave Braudaway

All day sessions for the conference will be held at the Convention Center with the Board meetings at the Hyatt. It was announced that all committees that desire meeting space at the conference should make their requests as soon as possible.

1991 GUEST PROGRAM - Hank Daneman

Hank Daneman summarized his activities to date. He informed the Board that there is a toll free telephone number to obtain further information on the area.

PUBLICITY - Hal Stitt

Hal Stitt informed the Board that he will use targeted mailings to better advertise the NCSL Conference. He requested any inputs from the Board for articles or information on the NCSL for the trade press.

REGIONS 1 & 11 DIRECTOR’S REPORT - Ralph Bertermann

Bob Willett met with Kelley McDaniel to offer help and suggestions to improve the KC Section. This assistance was much appreciated. Ralph Bertermann summarized the activities of Regions 1 and 11.

REGIONS 2 & 5 DIRECTOR’S REPORT - John Buck

John Buck summarized the activities of Regions 2 and 5.

REGIONS 3 & 7 DIRECTOR’S REPORT - Randy Seefeldt

Bard Dunkelburger resigned as Region 7 Coordinator and Ken Landis agreed to accept this position. Randy Seefeldt summarized the activities of Regions 3 and 7.

REGION 3 COORDINATOR - Brian Fitzpatrick

Brian Fitzpatrick has been just appointed as Region 3 Coordinator. The next meeting is scheduled for April 1991 and will be held at NASA/Langley. Bill Simmons made general comments on the history of Region 3 and the potential for this region to expand.

REGIONS 4 & 9 DIRECTOR’S REPORT - Charlie Sides

Charlie Sides informed the Board on the various meetings that are held at Boeing in Seattle. The remainder of the activities for Regions 4 and 9 was summarized by Charlie Sides. Tony Anderson commented on the turnout and activities of the Atlanta Section meeting.

REGIONS 6 & 8 DIRECTOR’S REPORT - Howard Castrup

Howard Castrup paid a special thanks to George Rice, Gary Davidson, and Dennis Pinneker for their assistance during the section’s meetings. The remainder of the activities for Regions 6 and 8 was summarized by Howard Castrup. Roger McCoy/Delphi has been appointed as the San Diego Section Coordinator.

INTERNATIONAL REGION DIRECTOR’S REPORT - Dave Duff

Dave Duff announced that he is currently coordinating with Duane Brown on the international activities. Dave Duff, in his present position, will be traveling to 15 to 20 facilities outside of the United States on routine company business.

LIAISON DELEGATE’S REPORTS - Graham Cameron

PRECISION MEASUREMENTS ASSOC. - Glenn Rasmussen

Glenn Rasmussen summarized the activities of the PMA for the last quarter. It was announced the PMA current membership now stands at 380.

AMER. ASSOC. FOR LAB. ACCREDITATION (A2LA) - Peter Unger

Bob Smith summarized Peter Unger’s report.

AMERICAN NATIONAL STANDARDS INSTITUTE - Rolf Schumacher

Dennis Pinneker summarized Rolf Schumacher’s report.

CONF. ON PREC. ELECTROMAGNETIC MEAS. - Art McCoubrey

Graham Cameron summarized the written report.

AMER. SOCIETY FOR QUALITY CONT. (ASQC) - Barry Craner

Bob Smith summarized the activities of the ASQC.
WESTERN EUROPEAN CALIBRATION CONFER. - Graham Cameron

Graham Cameron summarized this liaison's activities.

COUNCIL FOR RADIOMETRIC MEAS. (CORM) - Bill Simmons

Bill Simmons summarized CORM's activities. Of special interest, any liaison organization desiring space at the annual conference must contact Dean Brungart as soon as possible.

AMERICAN PHYSICAL SOCIETY (APS) - Klaus Jaeger

Klaus Jaeger summarized his report.

THREADED FASTENERS - Rich Hyman

No activities to report for the past quarter.

INTERNATIONAL LAB. ACCREDIT. CONF. - Graham Cameron

Graham Cameron summarized his report and highlighted the liability issues.

CHANGE IN THE VOLT & OHM - Norm Belecki

The requirements for this Ad Hoc Committee have been fully satisfied. Therefore no further actions for this committee are required and it is discontinued.

CHANGE IN THE UNIT OF MASS - Rich Davis

The requirements for this Ad Hoc Committee have been fully satisfied. Therefore no further actions for this committee are required and it is discontinued.

CHANGE IN THE INTERNATIONAL TEMP. SCALE - Billy Mangum

Bill Mangum summarized the activities of the committee over the past quarter. It was announced that anyone who desires to be on the distribution list for thermocouples must contact Bill Mangum.

METRICATION - Jim Ryan

A general discussion of the activities of this committee arose with emphasis on the future activities required. An action item was given to Gary Davidson and Wilbur Anson to perform the necessary actions reflecting that the Ad Hoc Metrification Committee has been moved to under the Vice President of Education and Training and that it will be incorporated into another standing committee.

TQM COMM. ON CAL. SYS REQUIREMENTS - Gary Davidson

Gary Davidson briefed the Board on the activities for the fourth quarter 1991.

A discussion arose over the activities of the WSC #1 Committee meeting. It appears that the ANSI/ASQC M-1 is being promoted as the U.S. document.

An action item was given to Gary Davidson to obtain sufficient copies of the ANSI/ASQC M-1 document for the Board to review.

A discussion arose over the future activities of this Ad Hoc Committee and it was agreed to make it a standing committee under the Executive Vice President.

An action item was given to Gary Davidson and Wilbur Anson to perform the necessary actions reflecting that the Ad Hoc TQM Committee on Calibration Systems Requirements has been changed to a standing committee under the Executive Vice President.

NEW BUSINESS - Bill Simmons

Klaus Jaeger presented his idea for the NCSL to present a purely technical conference very similar to the CPEM. The ensuing discussion covered the costs of the program and the anticipated amount of attendance. It was announced that Norm Belecki would be a good source to contact for this information. A discussion arose over the amount of cash reserves that is required for the continuing operations of the NCSL. An exact amount was not readily available.

ATTENDEES:

Graham Cameron, President, Dept. of Nat. Def.
Bob Smith, Ex. V.P., Loral Aeronutronic
Del Caldwell, Past Pres., U.S. Navy
Pete England, Past Pres.
Tony Anderson, V.P., Guildline Instruments
Jim Ingram, V.P., Inwil Metrology
Klaus Jaeger, V.P., Lockheed MSC
Bob Willett, V.P., JeAir Inc.
Tom McGovney, Treasurer, TRW
Bill Doyle, Secretary, U.S. Inst. Rentals
Ralph Bertermann, Director, Searle
John Buck, Director, Unisys
Howard Castrup, Director, ISG
EDITOR'S MESSAGE
(Continued from page 2)

GET WELL MARY
Mary Hurt, my usual typesetter and publication helper, is fighting a serious medical problem. I miss her attention to the production details that I don't like to bother myself with. But we have a substitute team, and the presses will still run on time.

We wish Mary a speedy recovery. (Which always reminds me of the joke about the corporate president, not well-liked, who landed in the hospital. He received a get-well card from his Board of Directors with the message that the Board had voted 4 to 3 to wish him a speedy recovery.)

DID YOU GET YOUR JANUARY ISSUE?
Around the time of the second class mailing of the January issue of the Newsletter, our regional bulk mail facilities had several stories written up in local papers about delayed mail. This was only U.S. mail, and was not involved with our overseas members. I made some calls and found some copies missing, and Wilbur Anson was planning on putting a notice in one of his member mailings. If you didn't get your January issue, call the Business Office to get another copy sent out.
Officially passing the Gavel of Authority from outgoing NCSL President, Bill Simmons (l) to Graham Cameron.

A well-deserved special award to hard-working (but low profile) Jeff Taylor of Lockheed, Georgia, who has handled the NCSL Honors & Awards Committee for about 8 years.

Active discussion with Dennis Pinnecker (l), Randy Seefeldt (c), and Hal Stitt (r). Hal has been getting NCSL some editorial position in industry magazines such as T&M World.

Joe Simmons, NIST (c), making an important point, with emphasis.

Here's an unheralded worker in the trenches, Tom McGowen of TRW, our NCSL Treasurer. If you've never seen the 1 cm thick financial reports he does, you don't realize how important he is to us. Incidentally, this year's budget and last year's actuals are reported in this issue.

John Buck, our Director from Unisys, looks after Regions 2 and 5, which is quite a task because of the multitude of Sections.

-8-
The EMF Committee, under the direction of Paul Chong, TRW, came along to Santa Barbara, and held their meeting there, and attended portions of the Board meeting too.

The EMF Committee in action. Pretty tough duty, coming to Santa Barbara during January when most of the rest of the country is in deep ice and snow.

An impressive assemblage of NCSL top brass out in front of the hotel. I've been to this place. The ocean beach is just behind the photographer.

Retired Past President, Pete England, drops by the Board meeting to offer some sage advice. Suzanne Griston looks serious.

What do you do with Past Presidents? You have them attend your Board meetings and use their experience and wisdom. Bill Simmons, Del Caldwell, Gary Davidson, Pete England, George Rice, and Dean Brungart. Bill is the only non-Californian.

Bill Simmons was running a workshop session to work on some organizational concepts, and we hope this gesture isn't too significant.
1991 NCSL
Metrology: A

When: August 19-22, 1991

Where: Convention Center, Albuquerque, New Mexico

Co-Sponsor: National Institute of Standards and Technology (NIST)

CONFERENCE THEME
Though some terms are viewed differently, the basic language of metrology is understood worldwide; regardless of the spelling, a gram or a meter is recognized by all who are engaged in the field of measurements.

The conference in 1991 will provide a forum for the exchange of ideas, and a program to provide information on World Wide Metrology.

The challenge of doing business on a worldwide basis, coexisting with EC92 and the Pacific Rim markets increases the importance of communication.

NETWORKING
Perhaps the unsung highlight of the NCSL Conference is meeting so many new people who have similar interests to you. You will meet people who provide a different opinion on an issue, another way to solve a problem, or a new perspective on a situation. You will value these contacts for years to come.

TECHNICAL PAPERS
This year's conference promises a host of excellent papers. If you have attended an NCSL conference, or if you have seen the published proceedings, you know NCSL's standards for papers are high. An entire session, one of four, will be devoted to Total Quality Management, quality standards and laboratory accreditation. You won't want to miss this one!

EXHIBITS
The conference will host exhibits presented by 60 of the leading companies supplying the calibration community. These firms will be represented by key executives, technical experts, and personnel trained in both demonstrating and providing useful information about their equipment and services.

A few booths are still available. For more information, please contact:
Dean A. Brungart
Telephone: (818) 717-6872
Facsimile: (818) 717-6862
CONFERENCE
Worldwide Language

NCSL COMMITTEE OPPORTUNITIES
Like any other organization, you get out what you put in. Be a contributor! Come meet the people who are doing the inside work and get involved. Committees meeting at the Conference include:

- Utilities Committee
- Calibration Systems Committee
- Calibration Intervals Committee
- Calibration Procedures Committee
- Laboratory Facilities Committee
- Medical Instrumentation Committee
- Automatic Test & Calibration Committee
- Laboratory Evaluation Committee
- Intrinsic and Derived Standards Committee
- International Region Member Delegates
- National Measurement Requirements Committee

FOR MORE INFORMATION OR TO REGISTER FOR THE 1991 CONFERENCE, CALL NCSL NOW: (303) 440-3339

OR WRITE:

NATIONAL CONFERENCE OF STANDARDS LABORATORIES
1800 30TH STREET, SUITE 305B
BOULDER, CO 80301

Serving the World of Measurement

ALBUQUERQUE

The Conference itself will be held at the Albuquerque Convention Center, however some functions will be held at the Hyatt-Regency hotel and the Doubletree hotel, conveniently located adjacent to the Convention Center.

Nearby Attractions:
Spanish History Museum
Indian Pueblo Cultural Center
Rio Grande Zoo
Old Town Area
National Atomic Museum
## NCSL BUDGET FOR CALENDAR YEAR 1991 AND 1990 ACTUAL
(January 1, 1991 through December 31, 1991)

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<td><strong>Laboratory Facilities</strong></td>
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<td><strong>Total - Conference Income</strong></td>
<td>271,585.00</td>
<td>264,062.38</td>
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<td><strong>Calibration Procedures</strong></td>
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<td><strong>Total - Conference &amp; Operations</strong></td>
<td>282,040.00</td>
<td>211,645.34</td>
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<tr>
<td><strong>Calibration Systems</strong></td>
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<td><strong>Total - Conference Expenses</strong></td>
<td>193,415.00</td>
<td>236,829.88</td>
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<td><strong>Calibration Intervals</strong></td>
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<td></td>
<td><strong>Total - NCSL Fiscal Balance</strong></td>
<td>18,380.00</td>
<td>19,938.80</td>
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<td><strong>Automatic Test &amp; Calibration</strong></td>
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<td><strong>Income-Expenses</strong></td>
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<td><strong>Measurement Assurance</strong></td>
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<td><strong>Measurement Requirements</strong></td>
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<td><strong>Intrinsic &amp; Derived Standards</strong></td>
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<td><strong>Biomedical Metrology</strong></td>
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<td><strong>Medical Instrumentation</strong></td>
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<td><strong>Equipment Mgmt. Forum (OP Expense)</strong></td>
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<td><strong>Total - Expense Accounts</strong></td>
<td>282,040.00</td>
<td>211,645.34</td>
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<td><strong>Petroleum Industry Measurements</strong></td>
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<td><strong>CONFERENCES AND FORUM SUMMARY</strong></td>
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<td><strong>Training Aids</strong></td>
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<td><strong>INCOME-EXPENSES</strong></td>
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<td><strong>Training Information</strong></td>
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<td>1991 EMF Summary</td>
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<td><strong>Glossary</strong></td>
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<td>1992 Conference Summary</td>
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<td><strong>Metrology Compendium</strong></td>
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<td><strong>Total - Conference &amp; Forum Summary</strong></td>
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<td><strong>Change in the International Temp.</strong></td>
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<td><strong>Summary (Income - Expenses)</strong></td>
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<td>27,232.50</td>
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<td><strong>Total - Operations Income</strong></td>
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<td><strong>Total - Committee Expense</strong></td>
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<td><strong>Total - Conference &amp; Operations</strong></td>
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<td><strong>Operation Expense Accounts</strong></td>
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<td><strong>Total - Conference Expenses</strong></td>
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<td>President's Expenses</td>
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<td>BOD Meeting Expenses</td>
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<td>Executive Vice President</td>
<td>2,000.00</td>
<td>1,639.42</td>
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</table>
COAST QUALITY METROLOGY SYSTEMS

Measurement Uncertainty-Measurement Assurance
(See Oct. 1990 issue, pg. 39, for course content)

12-16 August 1991, Albuquerque, New Mexico
To be held the week prior to the NCSL Annual Conference
and Symposium there.

Classes are held from Monday through Friday, 8:00 a.m. to
4:00 p.m.

In-house courses are also available to organizations at
dates and on premises of their choice. For more details,
please contact Marlene Chandler, COAST Quality Metrology
Systems, Inc.

Tuition

$US 900 per person, $US 850 if payment, purchase order,
or equivalent is received before July 15; add $50 per person
if payment is received thereafter. This includes all course
material, a course manual, and refreshments during class
hours. Meals and lodging are the responsibility of the
attendees.

Coast Quality Metrology Systems, Inc.
35 Vista del Ponto
San Clemente, CA 92672-3122
Telephone 714/492-6321

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AMERICAN ASSOCIATION FOR LABORATORY AC-
CREDITATION (A2LA)

Statistical Measurement Control in Laboratories

May 1-2, 1991, Marriott Harbor Hotel, Baltimore, MD.

Correct measurement is vital to the testing laboratory
process. Greater demand is being made on testing labor-
atories to improve their control over quality to assure
more accurate and reliable test results.

This workshop will provide you with the guidance necessary
to establish a statistically reliable measurement process in
your laboratory. It will introduce you to Statistical Process
Control (SPC) and the practical application of laboratory
practices that will assure consistency and reliability in test
measurements. You will become more knowledgeable in
the latest laboratory control processes that will provide for
quality results.

Who Should Attend:

• Laboratory Supervisors
• Quality Control Engineers
• Managers of Quality Assurance
• Supervisors of Applied Statistics
• Instructors in Testing Laboratory Procedures
• Management of Companies Using Testing Labs

Seminar Leader

Duncan C. McCune has 33 years’ experience in the field of
quality control and statistics. He was on the Corporate
Quality Control staff at LTV Steel for 30 years, and was
instrumental in establishing the Statistical Process Control
systems at LTV. Since 1986, he has been an independent
consultant working with both large and small companies,
as well as industrial trade associations, in setting up
quality and statistical systems. He has taught Industrial
Statistics, Design of Experiments, and Statistical Process
Control courses at the University level, as well as in plants
and laboratories since 1960.

Fee: $795 ($750 for A2LA Members)

How To Register:

You can register three ways: 1) Complete and mail Regis-
tration Form to CEEM (A2LA’s administrator for this
seminar), PO Box 200, Fairfax Station, VA 22039; 2) Call
CEEM at (703) 250-5900; and 3) Send Registration Form by
FAX to CEEMFAX at (703) 250-5313.

*****

AMERICAN ASSOCIATION FOR LABORATORY AC-
CREDITATION (A2LA)

Achieving Accreditation for Your Laboratory

May 1, 1991, Marriott Inner Harbor Hotel, Baltimore, MD

Attend this seminar and benefit from over 10 years of A2LA
experience in accreditation. Find out what you need to
know to establish your laboratory as an accredited lab.
Learn the steps necessary to acquire accreditation for your
laboratory and understand the quality principles and how
they apply to your laboratory. Receive guidance for preparing
a documented quality system and learn the steps necessary
for preparing an application. Learn about the general requirements for becoming accredited and the guidelines necessary for on-site assessment and proficiency testing.

A2LA accredits laboratories in the following fields of testing: biological, chemical, construction materials, electrical, environmental, geotechnical, mechanical, metrology, nondestructive, and thermal. Accreditation is available to private, independent, in-house and government laboratories. Join the growing number of laboratories who have benefited from the important process of laboratory accreditation.

Who Should Attend

Laboratory managers, quality control personnel, senior chemist project/administration coordinators responsible for accuracy and thoroughness of laboratory procedures will find this seminar a "can't miss" opportunity to update your laboratory's status.

Seminar Instructor

Peter Unger is Vice President of Laboratory Accreditation for A2LA, a non-profit, professional membership society administering a broad spectrum, nationwide laboratory accreditation system.

FEE: $495 ($450 for A2LA members)

How To Register

You can register three ways: 1) Complete and mail Registration Form to CEEM (A2LA's administrator for this seminar), PO Box 200, Fairfax Station, VA 22039; 2) Call CEEM at (703) 250-5900; and 3) Send Registration Form by FAX to CEEMFAX at (703) 250-5313.

* * * *

AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION (A2LA)

Calibration Laboratory Practices

May 2, 1991, Marriott Inner Harbor Hotel, Baltimore, MD

The "Calibration Laboratory Practices" Seminar will provide important information on metrology, calibration laboratory operations, and how to set up and manage a calibration program in a laboratory. Managers and quality control personnel will be apprised of the importance of calibration techniques. The program will cover: the philosophy of calibration and why it is necessary to calibrate; management systems; total quality management; preparation for laboratory audits; compliance with MIL-STD-45662A and other requirements.

Who Should Attend

Laboratory managers and quality control personnel responsible for accuracy and thoroughness of laboratory procedures will find this seminar a "can't miss" opportunity to update your company's practices. Those involved with training laboratory technicians as future metrologists will also find this course vital for tomorrow's needs.

Seminar Leaders

Mr. A. C. Catland, President of Measurement Technology Company has been involved in the design and marketing of instruments, systems and calibration equipment for over 35 years. Peter Unger is Vice President of Laboratory Accreditation for A2LA, a non-profit, professional membership society administering a broad spectrum, nationwide laboratory accreditation system.

FEE: $495 ($450 for A2LA members)
How To Register

You can register three ways: 1) Complete and mail Registration Form to CEEM (A2LA's administrator for this seminar), PO Box 200, Fairfax Station, VA 22039; 2) Call CEEM at (703) 250-5900; and 3) Send Registration Form by FAX to CEEMFAX at (703) 250-5313.

* * * * *

DIGITAL TRAINING COURSE NOW 5 DAYS

We've added an extra day to our Troubleshooting Microprocessor-Based Equipment and Digital Devices course to maximize the hands-on learning experience. A new hardback textbook will augment the two-volume set of workbooks used in the course. All three books are designed to be of continuing value to you after the training is completed.

The course is available for on-site presentations and the fee is $755.00 per person for groups of 10 or more. Call (913) 898-4695 now for a brochure and details on scheduling.

Micro Systems Institute

* * * * *

SHOCK AND VIBRATION MEASUREMENT

August 13-15, 1991 Salt Lake City, Utah
December 3-5, 1991 South Laguna, California

This application-oriented seminar is structured to give engineers and senior technicians a review of the basics and an opportunity to broaden their working knowledge in all aspects of accelerometer selection, installation, cabling, conditioning, and calibration. The course includes lectures and demonstrations on the following subjects: Vibration, Shock Motion, How Shock and Vibration are Measured, Accelerometer Performance Characteristics and Errors, Accelerometer Calibration, Acoustic Measurement and others.

FEE: $795 - 3 days

How To Register

Contact:  
Endevco  
307000 Rancho Viejo Road  
San Juan Capistrano, CA 92675  
(714) 493-8181

ELEVENTH EMAP WORKSHOP - PRELIMINARY ANNOUNCEMENT

The next Electrical Measurement Assurance Programs (EMAP) workshop is tentatively scheduled to be held in San Diego, CA, the week of October 28, 1991. This workshop, sponsored by the National Conference of Standards Laboratories and given by NIST staff, is a 4-1/2 day short course on the fundamentals of statistical process control, measurement assurance, and precision electrical measurements as applied to the maintenance and operation of standards and calibration laboratories. The course consists of lectures, discussions, hands-on measurement sessions, and computer-aided workshops designed to give the participants skills in data analysis and interpretation needed to maintain a quality assurance system in support of calibration activities. While the majority of examples given are couched in terms of precision dc voltage measurements, other electrical measurements areas are covered, and the principles apply to any precision measurement situation. The course is taught by Normal B. Belecki and Bruce F. Field of the Electricity Division and M. Carroll Croarkin and Dominic F. Vecchia of the Statistical Engineering Division.

The fee for the EMAP workshop will be approximately $1100. This covers the lectures and workshops, an extensive set of hand-out materials, lunches, coffee breaks morning and afternoon, and coffee and doughnuts on Monday morning prior to the commencement of the course. Breakfasts, dinners, and lodging are the responsibility of the attendees.

Early registration is encouraged. NIST regulations preclude running conferences and courses at a loss. Accordingly, if a minimum of 30 people is not registered by September 1, 1991, the workshop will be canceled to avoid loss of funds. If the workshop must be canceled, it will not be scheduled again within the following year, and there is a distinct possibility it will not be re-offered.

The exact venue and fee for this workshop will be made final by March 15, and will be conveyed by future announcements in the NCSL Newsletter as well as in brochures to be mailed in late April. For further information or to put your name on the mailing list, please call Sharon Fromm (301-975-4222) or Norm Belecki (301-975-4223). To register in advance, call Patrice Boulanger (301-975-3882).
DYNAMIC PRESSURE MEASUREMENT TECHNOLOGY

September 11-12, 1991  Denver, Colorado

This applications oriented seminar is structured to give engineers and senior technicians a review of the basics and an opportunity to broaden their working knowledge in all aspects of dynamic pressure measurement. The course includes lectures and demonstrations on the following subjects: Pressure Definitions, Terminology, Units and Conversions, Static and Dynamic Pressure Phenomena, Pressure Measuring Instruments, Calibration and others.

FEE: $595 - 2 days

How To Register

Contact:  Endevco
307000 Rancho Viejo Road
San Juan Capistrano, CA 92675
(714) 493-8181

MODERN MICROWAVE TECHNIQUES

March 11-14, 1991  Monterey, California
September 23-26 1991  San Diego, California

This course provides the practicing engineer with a working knowledge of high frequency and microwave principles. It is geared to achieve an intuitive feel for the concepts involved. It introduces and deals with measurements of systems, instruments, components, and devices in the microwave field. It also acquaints the participants with the uncertainties and errors, and the limitations of present day microwave equipment and measuring techniques.

FEE: $1195 - 4 days

How To Register

Contact:  University Consortium for Continuing Ed.
18161 Ventura Blvd., M/S 752
Encino, CA 91436
(818)995-6335

MEASUREMENT UNCERTAINTY TRAINING COURSES

Course Number 9111
June 24-27, 1991  Denver (Northglenn), Colorado

Evaluating the uncertainty of measurements is a vital part of Total Quality Management (TQM). Controlling the quality of measurements is an important first step in controlling product quality. As the quality of measuring instruments continues to improve, many organizations are unable to maintain the desired 4:1 accuracy ratio between calibration standards and measuring instruments. Deviations from this 4:1 accuracy ratio must be documented using uncertainty techniques to verify that accuracy has not been degraded. This course will provide instruction in evaluating measurement uncertainties.

The concepts learned in this course can also be used very effectively in other situations including: design of experiments; design of measurement systems; pre-test analysis to decide if a target uncertainty can be met; selection of measuring instruments; monitoring and control of measurement systems with control charts; and providing direction on how to improve measurement systems.

These and other uncertainty techniques will be discussed. Students will work practice problems that illustrate real world applications.

Topics Covered (Partial)
* Nature of Measurement Errors
* Variability of Measurements
* Random and Systematic Errors
* Analyzing and Interpreting Data
* Statistics; Mean, Variance, Standard Deviation, Standard Error
* Probability
* Confidence Levels
* Small Samples
* Quantifying Random Uncertainties
* Quantifying Systematic Uncertainties
* Total Uncertainty
* Uncertainty Statements

Tuition

The tuition for each four-day training course is $895 per person. The tuition includes all course materials, a comprehensive notebook and refreshments during class hours. It does not include transportation, meals, or hotel accommodations.

LIQUID AND GAS FLOW MEASUREMENT TRAINING

Course Schedule

Liquid Flow Measurement - June 4-7, 1991

Both classes will be held from 8:00 am to 4:00 pm at the:
Wyndham Garden Hotel
1300 Chesapeake Terrace
Sunnyvale, California 94089

Tuition

The tuition for each four-day training course is $795 per person. For individuals attending both the Liquid and Gas Flow courses, the total tuition is $1295. The tuition includes all course materials, a comprehensive notebook and refreshments during class hours.

LIQUID FLOW MEASUREMENT

Course Number 9109

Course Objectives:
After completing this course, each student will understand the optimum selection and use of liquid flowmeters. In addition, each student will understand how density and viscosity affect liquid flowmeters; each student will also know how to calibrate liquid flowmeters using primary and secondary flow standards.

Topics Covered (Partial)
* Introduction to Flow Measurement
* Flowmeter Theory
* Secondary Instruments
* Fluid Properties
* Reynolds Number Characteristics
* Liquid Flow Measurement Systems
* Fundamentals of Liquid Flowmeters
  Differential Pressure, Pitot Tube, Variable Area, Turbine,
  Ultrasonic, Vortex Shedding, Positive Displacement, etc.

GAS FLOW MEASUREMENT

Course Number 9110

Course Objectives:
After completing this course, each student will understand the optimum selection and use of gas flowmeters. In addition, each student will understand Gas Law calculations and how they apply to gas flow measurements. Each student will also know how to calibrate gas flowmeters using primary and secondary flow standards.

Topics Covered (Partial)
* Installation Effects
* Flowmeter Selection

* Advantages and Disadvantages
* Primary Calibration Standards
* Bell Provers, Glass Tube Volume Calibrators, Computer Controlled volume Calibrators
* Secondary Calibration Standards
* Traceability to NIST
* Dynamic Flow Measurements
* Flowmeter Maintenance
* Discussion of Individual Applications

CONTACT: Measurement Technology Company, 12620 Avenida De Espuela, Poway, CA 92064-2535. A tentative registration can be made by phone (619) 451-2274.

DALFI, INC.
Metrology Training Seminars

Introduction to Metrology/Calibration
Units of Measure
Systems of Units
Philosophy of Calibration
Calibration Hierarchy
Traceability and Test Accuracy Notice
Recommended Laboratory Documents
Primary, Secondary, and Transfer Standards

Statistical Process Control Programs
Understanding Measurement Capabilities
Classification of Measurement Errors
Collection, Organization and Interpretation of Measurement Data
Statistical Terms in the Field of Measurements
Confidence Levels, Small Sampling and Student's t
Quantifying Uncertainties into an Overall Statement
Measurement System/Process Evaluation and Monitoring

Quality Control Program Evaluation/Implementation
Responsibilities to the Program
Organizational Structure
Documentation Requirements/Procedures
Inspection/Verification/Audit Programs
Handling, Storage, Packaging and Shipping Procedures
Governing Requirements/Regulations

The Regional Schedule for the above seminars is as follows:

13-16 May 1991 Dallas, TX*
8-11 July 1991 Chicago, IL*
14-16 Aug. 1991 Albuquerque, NM*
9-12 Sept. 1991 Seattle, WA*

*Actual location of regional seminars to be announced.
On-site seminars are offered on a per day basis. To register or request additional information on seminar schedule and/or content, please contact Roger J. McCoy at (619) 578-9500.

* * * * *

BESSER ASSOCIATES

RF Component Modeling

University of Santa Clara
Santa Clara, California
March 25-27, 1991

RF and high-speed digital circuit design has changed significantly during the last two decades. The emergence of CAD shortens product development as designers are becoming more dependent on computerized procedures.

In this three-day course, designers will learn about passive component models (resistors, inductors, capacitors, transmission lines, crystals, ferrite beads and transformers), become familiar with applicable RF test equipment, CAD tools, de-embedding techniques, and perform interactive optimization using workstations linked to network analyzers. The importance of statistical databases and practical ways of collecting data are also covered. At the conclusion of each day, participants apply the models to simulate the performance of a "real-life" RF circuits.

Seminar Leader

Les Besser, President, Besser Associates, Los Altos, California. Often referred to as the founder of the microwave CAD industry, he has acquired a great deal of experience in the field. He worked for the microwave division of Hewlett-Packard and Fairchild, and directed the microcircuit development effort at Fairchild.

Fee: $795.

How To Register:

Attendance is limited and early registration is recommended. Send completed form with payment to:

Besser Associates
4600 El Camino Real, Suite 210
Los Altos, CA 94022
(415) 949-3300

* * * * *

Ed. Note: Too many training notices get to me too late for catching a useful Newsletter—in this case, January. This April 22 date will be given on about the same date most members get their April copy.

MASS MEASUREMENTS:
PRINCIPLES AND PRACTICES
A Workshop Conference and Exhibition

Sponsored by:
Institute of Nuclear Materials Management
INMM
April 22-24, 1991
J. W. Marriott Hotel
Atlanta, Georgia
The three day program features a different emphasis each day:

• Day 1: Process Measurement Assurance Program (PMAP) Seminar/Tutorial describes the specific use of Statistical Process Control techniques in improving and monitoring the quality of mass measurements in the workplace.

• Day 2: A Symposium of 16 invited papers cover a wide variety of subjects dealing with mass measurements quality control, calibrations, automation, MAPs, balances, standards, applications, error management, etc.

• Day 3: A Series of Workshops will facilitate the interchange of information between experts in various fields of mass measurements and the attendees.

Fee: $475 member and $525 non-member.

Questions

Please contact:
Chairman:
John P. Clark
Westinghouse SRS
(803)725-1652
Fax: (803)725-1259
METROLOGY CALENDAR

INDUSTRY MEETINGS
ISA Intl. Instrum. Symposium, May 9, 1991
San Diego, CA
CONTACT: Glen Harvey, (619) 549-9411

IMTC/91, May 14–16, 1991
Omni Hotel, Atlanta, GA
CONTACT: Robert Myers, (213) 287-1463, Fax (213) 287-1851

CORM, May 21–22, 1991
NIST
CONTACT: Bill Simmons, (301) 488-3192

1991 NCSL Workshop & Symposium, August 18–22,
Hyatt Regency Albuquerque, Albuquerque, NM
CONTACT: Wilbur Anson, (303) 440-3339
Editors Note: Registration Information

REGIONAL MEETINGS SCHEDULE

REGION 1

April 1991
CONTACT: Brian Gurney, (508) 456-9480

October 1991
CONTACT: Brian Gurney, (508) 456-9480

REGION 2

Philadelphia Section, April 1991
CONTACT: Gary Foster, (215) 822-2929 X2548

Upstate New York Section, April 16, 1991
CONTACT: John Wehmeyer, (716) 477-8891

Philadelphia Section, October 1991
CONTACT: Gary Foster, (215) 822-2929 X2548

Pittsburgh Section, October 1991
CONTACT: Don Drum, (412) 287-8711 X352

Upstate New York Section, October 1991
CONTACT: John Wehmeyer, (716) 477-8891

REGION 3

April 4, 1991
Cox, Div. of Ketema, XSYS Corp.,
Newport News Ramada Inn
CONTACT: Brian Fitzpatrick, (301) 987-4000

October 24, 1991
Washington DC
CONTACT: Brian Fitzpatrick, (301) 987-4000

REGION 4

Central Florida Section, April 17, 1991
CONTACT: Mike Maxwell, (407) 867-3253

Atlanta Section, May, 1991
CONTACT: Ernie Sharp, (404) 980-7463

 Huntsville Section, May 15, 1991
CONTACT: Jim Harmon, (205) 876-2666

Central Florida Section, October, 1991
CONTACT: Mike Maxwell, (407) 867-3253

Atlanta Section, November, 1991
CONTACT: Ernie Sharp, (404) 980-7463

 Huntsville Section, November 13, 1991
CONTACT: Jim Harmon, (205) 876-2666

REGION 5

Northern Ohio, April 9, 1991
CONTACT: Anne Zucker, (216) 581-5324

Michigan Section, May 15, 1991
CONTACT: Tom Lowler, (313) 283-8599

REGION 6

West Section, March 21, 1991
NIST
CONTACT: Delmede LaVallee (303) 440-6841

Central Sect.-Dallas/Ft. Worth, April 3, 1991
Hewlett Packard, Campbell Rd., Richardson, TX
CONTACT: Clyde Orrison, (214) 995-5032

South Section, July 1991
CONTACT: Gilbert Uribe, (512) 925-6104

Central Sect.-Dallas/Ft. Worth, Nov. 6, 1991
Tektronix
CONTACT: Clyde Orrison, (214) 995-5032

West Section, March 1992
Ball Aerospace Systems, Boulder, Co.
CONTACT: Ron Eubanks, (214) 416-4034

Central Sect.-Dallas/Ft. Worth, April 1992
John Fluke Mfg. Co., Inc.
CONTACT: Clyde Orrison, (214) 995-5032

West Section, September 1992
Ball Aerospace Systems, Boulder Co.
CONTACT: Ronnie Eubanks, (214) 416-4034

Central Sect.-Dallas/Ft. Worth, November, 1992
Hewlett-Packard
CONTACT: Clyde Orrison, (214) 995-5032
REGION 7

June 7, 1991
Hewlett Packard - Palo Alto
CONTACT: Ken Landis, (415) 964-5500

October 31, 1991
Hewlett Packard - Mountain View, CA
CONTACT: Ken Landis, (415) 964-5500

REGION 8

Phoenix/Tucson Section, April 11, 1991
CONTACT: Wayne Benda, (502) 784-4483

San Diego Section, May 22, 1991
CONTACT: Roger McCoy, (619) 586-6365

LA/Valley Section, June 12, 1991
CONTACT: Claude Fourroux, (714) 821-5535

LA/Orange County Section, September 18, 1991
CONTACT: David Collins, (714) 945-2317

San Diego Section, October 23, 1991
CONTACT: Roger McCoy, (619) 586-6365

Phoenix/Tucson Section, October 24, 1991
CONTACT: Wayne Benda, (502) 784-4483

LA/Valley Section, November 13, 1991
CONTACT: Claude Fourroux, (714) 821-5535

REGION 11

Chicago Section, April 2, 1991
IITRI Riverbank Acoustic Lab, Batavia, IL
CONTACT: David Walters, (708) 450-5595

St. Louis Section, April 18, 1991
Kansas City, MO
CONTACT: Kelley McDaniel, (913) 782-0400
X2652

Twin Cities Section, May 7, 1991
CONTACT: Jerry Kolkind, (612) 692-4576

St. Louis Section, October 8, 1991
St. Louis, MO
CONTACT: Kelley McDaniel, (913) 782-0400
X2652

Chicago Section, October 15, 1991
NutraSweet, M. Prospect, IL
CONTACT: David Walters, (506) 450-5595

Twin Cities Section, November 12, 1991
CONTACT: Jerry Kolkind, (612) 692-4576
Editor's Note--

With the job crunch rippling through our aerospace community, there are already member delegates and other employees from member companies who have been hit by RIFs (reductions-in-force) triggered by their company's retrenchments. Fortunately, NCSL has in place an electronic resume-posting service at the NCSL Business Office.

The NCSL Bulletin Board has been in operation for several years now, but the resume-posting was added in August 1990. The postings have risen steadily and now stand at 84. While the listings are predominantly metrology technicians, metrology engineers and even supervisors and managers are welcome too.

Activity is going well, and Wilbur reports several specific instances where a Texas computer company found 4 candidates and may take 2 more. A Southern California company found 2 candidates. So there is activity, and new candidates are encouraged to submit their information to the Business Office.

Business Manager Wilbur Anson has set the following guidelines for data, shooting for two names per computer screen, which eases the job of the person seeking candidates in their review of the data. Total text should be limited to between 250 and 300 words.

- Name
- Address
- Phone
- Date of Availability
- Date of Separation from Service (for military)
- Geographical Preference
- Brief summary of experience and desired position

I hope that we can help out these associates who will be struggling through a difficult time.

1991 ANDY WOODINGTON AWARD

Mr. Gary Davidson of TRW has been honored by the Measurement Science Conference as this year's recipient of the Woodington Award. The award was presented at a luncheon ceremony during the Conference by the Chairman of the Board, Mr. Dennis Pinnecker of Rockwell. This award, sponsored as a memorial to the late Andrew J. Woodington, was created in 1978 to honor "Andy" Woodington and perpetuate the high ideals for which he stood. The award is made to a member of the measurement community who exhibits in his personal and professional conduct the mark of the true professional. Andy was well known in the field of Metrology and was in attendance and participated in the meetings of 1961 that resulted in the formation of the NCSL.

This year's winner exemplifies the necessary requisites that this award stands for. His contributions to NCSL alone would require a column to list. He has participated in numerous conferences including Measurement Science, Equipment Management Forum, NCSL, and many Region and Section meetings.

He has been NCSL Treasurer, Executive Vice President, President, Past President, and has chaired many committees and meetings. He is Chairman of the Administrative Guidelines and By-Laws, and TQM Committee on Calibration System Requirements.

Gary has been involved with metrology and measurements for more than 26 years. He has been manager of test equipment management and is currently manager of the metrology operations at TRW.

Gary is very deserving and has earned this honor, so when you have the opportunity, step up and offer your congratulations.
Once again the Butler County Community College is anticipating the graduation of another class of outstanding Metrology students. This year there are 13 who are eligible for the degree. One unique feature of this year's class is that they are the first group to be trained under the new, revised curriculum for the full two years of the program.

We have found that the new arrangement of courses has greatly enhanced the students' academic experience. More emphasis on physical, dimensional, and electrical metrology as well as computer applications and programming make the current class a valuable source of employees in the field.

Further questions about the program can be directed to Lynn Thompson at (412) 287-8711, ext. 233. In addition, we have a job placement counselor, Fred Kinnick, ext. 325, who can facilitate the posting and announcement of any job opening. Students may be contacted directly by their address or phone which is provided with each biography.

Cooper: Chemical metrology is my primary interest, but I am open to job opportunities in all fields of metrology. My laboratory experience and successful academic studies (3.55 G.P.A.) have prepared me for a challenging career in metrology. Past experience has shown me to be honest and hardworking. Employment in the eastern U.S. is preferred.

167 Grimm Road, Sarver, PA 16065 (412) 353-9225

Ellison: As a Metrology student, I am required to complete an eight-week internship with a metrology oriented company. I prefer an entry level position which will use my skills in electronics, digital electronics, or microprocessors. Academic training in dimensional metrology and statistical process control has peaked my interests in those areas as well. However, any opening will be given serious consideration.

Eventually, I plan on continuing my education to further develop my skills as well as increase my value to a company dedicated to quality and growth in the field of metrology. I am willing to relocate.

314 Cherokee Drive, Butler, PA 16001 (412) 287-8535

Everett: My studies at Butler County Community College have prepared me to begin a career in the field of metrology. Areas of particular interest to me are optical, dimensional, electrical, and quality control. While studying at Butler County Community college, I have earned a cumulative G.P.A. of 3.56. I am eager to begin my career and enhance my academic experience with on-the-job experience. I have no geographical preference and am willing to relocate.

Permanent address (weekends and after May 20): R.D. #1 Box 55, Guy Mills, PA 16327 (814) 789-2365
Temporary address (weekdays): 219 Fairview Avenue, Butler, PA 16001 (412) 285-7600

Himelinski: The program at Butler County Community College is very diverse and thorough in covering all aspects of metrology. This has provided me the opportunity to acquire a comprehensive background for employment in positions ranging from laboratory work to technical sales. I am open to job opportunities within this wide range. Both the theoretical and practical applications, applied through extensive lab work, have enabled me to collect and analyze data as well as strengthen my documentation and communication skills. I have enjoyed my academic experience and have been successful in maintaining a 4.0 G.P.A. in career courses. These positive experiences have contributed to my feeling that metrology is the right career choice for me.

318 Star Grille Road, Cabot, PA 16023 (412) 352-1624
Knickerbocker: I am seeking a career involving the repair and design of precision measurement systems, the collection of measurement data, and the analysis of the data through quality control techniques used by my employer. With the skills obtained by achieving a 3.79 G.P.A., I feel confident in any field of metrology. Currently, I do not have any geographical preferences, and I am willing to relocate in the U.S. or abroad. My interests have been broadened to include international employment prospects through a 1-year student exchange program to Australia with Youth for Understanding.

Permanent address (weekends and after May 20)
R.D. #2 Box 151, Guys Mills, PA 16327 (814) 789-2313

Temporary address (weekdays):
219 Fairview Avenue, Butler, PA 16001 (412) 285-7600

McGrath: Metrology A.A.S. Degree student desires entry level position in an electronic calibration/quality control setting. (Availability date: 01 June 1991). College training includes a variety of theoretical and practical experience in electrical, optical, chemical, dimensional, temperature, and pressure metrology disciplines. Seven years as an aviation electrician in U.S. Navy and two years as a SQC technician in a glass fabricating plant have provided valuable on-the-job experience. Practical background includes operating and maintaining various electrical and pneumatic systems, acquisition and utilization of statistical data, and management interaction with work center superiors and subordinates. Extra-collegiate activities include Treasurer of Metrology Club and Returning Adult Student Association, Science Department work program (preparation and maintenance of physics and chemistry related laboratory equipment), and algebra tutoring. Willing to travel and/or relocate in the U.S. or abroad immediately upon graduation.

P.O. Box 1725, Butler, PA 16003-1725 (412) 287-1917
Alt: P.O. Box 821, Kittanning, PA 16201 (412) 543-3245

McKruit: After finishing my classroom studies in May, I will be ready to being full-time employment through a summer practicum. This is the final requirement of the Metrology curriculum at Butler County Community College. Destructive and non-destructive testing are of particular interest to me. However, I am willing to consider opportunities in all fields of metrology. A position in the eastern states is preferred, but all options will be seriously considered.

347 Edgewood Drive, Cabot, PA 16023 (412) 352-9069

Natili: Currently I am enrolled in the Butler County Community College Metrology program. I am eager to apply my knowledge of spectroscopy, chemistry, and electricity to an entry level laboratory position. Precision, accuracy and strict attention to detail are the qualities I reflect in my work.

310 North Duffy Road, Butler, PA 16001 (412) 287-4115

Sopel: I am eager to obtain a position in the field of Chemical Metrology and Quality Control which focuses on research and development. However, openings in other areas of metrology will be seriously considered. Confidence
in the theory and lab skills acquired at Butler County Community College provide me with the qualifications necessary to meet the needs of my future employer. Continuing my education while working is a goal I plan to pursue so that I develop more advanced skills to benefit the company which hires me. Although I will consider relocation, a position in Western Pennsylvania is preferred.

107 Bessemer Avenue, Lyndora, PA 16045 (412) 285-1427

Stanfield: On May 19, 1991, I will complete the academic training portion of the Metrology program at Butler County Community College. Subsequently, I will commence the final phase of the program. This is an internship course designed to provide students with a minimum of 320 hours of practical experience in the measurement field. A position where I can attain this practical experience and be considered for permanent employment is desired. Electronics, digital electronics, chemistry, and statistical process control are my primary interests. However, I will give consideration to any internship offer related to the field of metrology. I am eager to begin this final phase of my training and welcome inquiries from prospective employers.

124 Iroquois Drive, Butler, PA 16001 (412) 287-7958

Mike Stocker

Tom Uenking

Stocker: I have always had a keen interest in science and technology. The metrology program offered at Butler County Community College was perfect for me. In two years the program prepared me for a job in industry as a technician. Electrical, digital, and optical metrology are the specific areas of metrology that I prefer. The variety of measurement skills and techniques I obtained make me quite valuable to an employer in the area of quality control. Eventually, I plan to continue my education to obtain a B.S. degree in engineering or quality control. I have no geographical preference.

Permanent address (after May 20):
R.D. #5 Box 133, Titusville, PA 16354 (814) 676-9321

Wiles: I am seeking a position with an innovative firm that will utilize my knowledge and skills in the field of Metrology in a research and development or quality control capacity. In addition to my broad academic training, I have strong communication skills, creative abilities, and mechanical aptitudes. These qualities, along with my commitment to personal growth, will be very valuable to a future employer. Future plans include continuing my education in a Metrology related field. I am willing to relocate anywhere in the U.S.

121 Campbell Drive, Butler, PA 16001 (412) 283-8038

Fred Wiles

Uenking: I am seeking employment in the repair and design of electronic and measurement systems. My four year Naval experience in electronics and my A.A.S. degree in Metrology from Butler County Community College make me especially qualified for employment in a growing company. Though I have experience in electronics I am also interested in the other areas of the metrology field. My extensive laboratory report writing and ability to collect and analyze data are an added feature to my attributes. Primarily, I prefer employment opportunities in Virginia, North Carolina, Pennsylvania, and Eastern Tennessee, but I am willing to consider other options.

R.D. #2 Box 1479, Chicora, PA 16025 (412) 445-3071

1177 Bessemer Avenue, Lyndora, PA 16045 (412) 285-1427

Uenking: I am seeking employment in the repair and design of electronic and measurement systems. My four year Naval experience in electronics and my A.A.S. degree in Metrology from Butler County Community College make me especially qualified for employment in a growing company. Though I have experience in electronics I am also interested in the other areas of the metrology field. My extensive laboratory report writing and ability to collect and analyze data are an added feature to my attributes. Primarily, I prefer employment opportunities in Virginia, North Carolina, Pennsylvania, and Eastern Tennessee, but I am willing to consider other options.

R.D. #2 Box 1479, Chicora, PA 16025 (412) 445-3071
It has been a source of continuing satisfaction to watch the progress of NCSL during the past 30 years. While it was I who, at the 1960 Conference, recognized and stated the need for an association of standards laboratories, it was Bill Wildhack's concrete suggestions that led to the lunch-hour meeting at which the organization actually became a reality. It is to Bill, to Charlie White whose man-in-the-oval logo still graces the NCSL Newsletter, and to the several Chairmen who saw the organization through its formative years that the credit really belongs.

Since I retired in 1972, I have made no contribution to the field of standards and precision measurements by which to deserve recognition in the Newsletter as "Someone you should know." However, I have kept busy in retirement and along with recreation have learned a few valuable things not related to standards.

My wife Evelyn and I haven't become world travelers, as have so many retirees, but we have been around quite a bit with some type of recreational gear, ranging from a tent to a mini motorhome, getting to know the varied aspects of the U.S. as well as Mexico and Canada. Last summer we went along the north shore of the St. Lawrence, partly on a freighter which will carry small RVs, to the edge of Labrador. Combined with an earlier trip, Labrador via the island of Newfoundland, this makes a fine loop trip to an interesting part of the northland. The photo was taken at Montmorency Falls, just east of Quebec City.

With one minor exception I have been within a couple of hundred miles of every spot in the lower 48 and have lived in several states, from California to Vermont. As a result, I do not have strong regional or state loyalties. I deplore the fragmentation of nations that has occurred since World War II and am thankful that our Founding Fathers created a system of government that, despite its many shortcomings, still enables us to function as a single nation.

All of us learn soon that the basic necessities of life are food, clothing, and shelter. These may suffice while people are few in number and widely dispersed, as in the days of Daniel Boone. However, with increasing population density, the science and art of living together become more urgent. There were topics that I ignored as much as possible while concentrating in school on physics and mathematics and, later on, while busy at work with such things as radar antennas, microwave systems, and precision measurements. In retirement, however, I have had time to read and think about the origin of our nation, back in an era called The Enlightenment, and to follow its development down to the present time.

To thinking people, the numerous difficulties and problems with which our nation is confronted are well known if not well understood or their solutions agreed upon, while many "couch potatoes" seem oblivious of the problems. I am particularly concerned with the low esteem in which our governing bodies, from the local to the national level, are held—and deservedly so. These are supposed to be "committees" appointed to carry out the will of their constituents and at times to provide enlightened leadership in modifying that will. Yet through our political parties we seem unable to elect people who at any level will represent us rather than the special interests and their political action committees.

I see the need for a citizens' organization which will systematically monitor the actions of elected representatives at all levels, will study the problems involved and

(Continued on page 68)
The National Institute of Standards and Technology (NIST) has announced a major reorganization of its management structure to improve the agency's support of U.S. industry, science and engineering, and the public.

The reorganization eliminates one level of management and combines several research groups into larger laboratory units. No reductions in NIST laboratory programs or staff are involved.

NIST Director John W. Lyons said, “The restructuring will enable NIST to better meet its key goals of helping industry improve its international competitiveness, supporting U.S. science and engineering, and improving public health, safety, and the environment.

"By streamlining our research organization, we can devote maximum resources to these efforts," Lyons said.

Two upper management structures, the National Measurement Laboratory and the National Engineering Laboratory, and several mid-management structures have been consolidated. Their functions have been folded into the following units:

- Electronics and Electrical Engineering Laboratory
- Manufacturing Engineering Laboratory
- Chemical Science and Technology Laboratory
- Physics Laboratory
- Building and Fire Research Laboratory
- Computing and Applied Mathematics Laboratory

The functions of the Materials Science and Engineering Laboratory and the National computer systems Laboratory remain the same, except the latter's name has been changed to the Computer Systems Laboratory. There is no change to programs within Technology Services.

Lyons said the reorganization encourages closer interaction among NIST's technical units and lets him use a "hands-on" management approach and develop a closer working relationship with the research staff.

Established as the National Bureau of Standards in 1901, NIST became the National Institute of Standards and Technology under the Omnibus Trade and Competitiveness Act of 1988. At the same time, the agency received an expanded mission to boost U.S. industry in the world marketplace.

NIST is an agency of the Commerce Department's Technology Administration.
The ISO Technical Committee (TC) 176, Quality Management and Quality Assurance, met October 14 through 20, 1990, in Interlaken, Switzerland. Twenty-seven countries were represented by 174 delegates. Eight more persons represented various organizations. With nineteen delegates, the US delegation was the largest. This is to report on the aspects and results of the meeting of the likely interest to those concerned with the metrology standards writing efforts and related aspects.

PLENARY SESSION

The "Standard Guide for Implementation of ISO 9001, ISO 9002, ISO 9003" draft of 16 January 1990 was discussed during the plenary session. This document had been circulated for comments and votes by Subcommittee (SC) 2, Working Group (WG) 4. Of considerable concern to the US was the fact that the US did not receive the document and was left out from the voting process. The reasons for this accident were not clear yet, but ISO procedures do not require ballots on drafts. A majority of countries voted to disapprove, several of them for fear that it may add to confusion and possible conflicts between requirements and suggested methods of implementation and the guidelines set forth in ISO 9004. A near-term need for such a document, however, is recognized by the Working Group, and work on the document is proceeding.

Don Marquardt, leader of the US delegation to ISO/TC 176 and chairman of the ISO/TC 176 Ad-Hoc Task Force on ISO 9000 Series Architecture, Numbering, and Implementation, reported on "A Strategy for International Standards Implementation in the Quality Arena during the 1990s." Accordingly the ISO 9000-series standards will be modified and expanded to address themselves to the more specific need of four distinct "generic product categories" (hardware, software, processed materials, and services) and specific "industry's economic sectors." A considerable expansion and modification of the existing 9000-series and related standards can be expected during the next decade.

The Vote on DIS 10012.1

It was announced that the Draft International Standard, DIS 10012, Quality assurance requirements for measuring equipment - Part 1: Management of measuring equipment, was approved by 19 countries against the disapproving votes of the USA, Austria, Denmark, France, and Ireland.

The following reasons were given by the other countries for their disapproval:

Austria: "Chapter 3.1 to 3.22 ... (and) 3.24 and 3.25 ... are identical items of the (VIM or) ISO 8405 [sic]. Therefore this chapter must be shortened or deleted." - End of rationale.

France: (Freely translated by the undersigned.) 1. The project has not sufficiently matured, necessary to be edited under ISO rules and adopted as a European standard with binding character. 2. Needs restructuring because it is relatively disorganized. 3. Says too often how the job is to be done rather than what should be accomplished. 4. Improper usage of the term "qualification."

Denmark: "- the presentation mixes requirements and merely informative matters - in some respects DIS 10012 is in conflict with ISO 9001, i.e. DIS 10012 contains more requirements than ISO 9001 - the terminology should be harmonized."

Ireland: 1. Requirements for null detectors are too lax. 2. Unclear meaning of "other formal evidence of functioning in par. 4.3.a. 3. A calibration agency cannot be required in all cases to put a due date on the calibration label (par. 4.10). 4. Calibration laboratories should apply calibration intervals so that all measuring equipment is in tolerance; only users of measuring equipment should apply statistical methods to determine intervals.

The French points 1. and 3. and the Danish point 1 have been raised repeatedly also in the US comments and change proposals.
The Internal US Ballot

The draft document DIS 10012.1 was circulated in the USA throughout the US TAG to TC/176 and the Task Group 1 supporting me as the representative to WG 1. It was accompanied by a proposed vote and a set of proposed change recommendations and comments for consideration by all reviewers and a request for their votes and change recommendations. Some also voted on the document without the benefit of our initial comments and were unaware of our position and the problems we were having with the draft document. Therefore, the US vote consisted of:

- Approve as presented: 14
- Approve with comments: 7
- Disapprove for technical reasons: 3
- Disapprove - Approve if changed: 14
- Abstain: 2

All change recommendations that were consistent with our position were incorporated in our final submittal to ISO.

In accordance with ANSI rules, our vote had to be “Disapprove” because the lack of consideration of measurement assurance brought the document in conflict with ANSI/ASQC M1-1987.

During the final meeting of SC 3, the Australian delegate offered that more of the international vote would have been negative had those who voted on DIS 10012 been more familiar with the details of the problems. Most or all of the US voters who first approved the DIS had changed their vote to disapproval when they learned about the problems; hence, our experience bears out the Australian observation. It also illustrates the importance for US ballots on ISO documents to be accompanied by comments and the opinions of the responsible US delegates.

SUBCOMMITTEE 3

A new Subcommittee 3, “Supporting Technologies” had been formed earlier, and the Netherlands had won the secretariat. The scope of the subcommittee is “To develop a coherent set of documents regarding technologies (including tools and criteria) which support and evaluate Quality Management and Quality Assurance. Note: Technologies are in this context defined as the means to implement and maintain Quality Systems.” The subcommittee was activated with this first meeting.

Working Group 1 of ISO/TC 176 had already been assigned to Subcommittee 3. Mr. Muntendam had been appointed Secretary, and Mr. Bremer (also Netherlands) was now elected Convener. An additional Working Group (WG2), “Guidelines for developing a Quality Manual.” was formed. Dr. Lawrence Wilson (USA) was then elected Convener of WG2.

“Larry” Wilson, member of the Subcommittee of Systems and Procedures of ANSI Committee 2-1 in 1978 had been instrumental in the formation of our ANSI/ASQC Writing Group that wrote ANSI/ASQC M1-1987 on calibration systems. As Director of Quality Assurance of Lockheed Georgia Co., he had proposed to the Z-1 Committee that a standard be written for calibration systems that included the newly developed approaches to measurement process controls (measurement assurance). This was the result of his numerous discussions with his calibration laboratory manager, Bob Lady, who had brought measurement assurance to Larry’s attention. Bob Lady (now retired) had been very active in NCSL where he had served as Vice President for several years.

WORKING GROUP 1

The participants of Working Group 1 were:

- Peter Clifford, British Standards Institute, Convener
- Australia: John Birch
- Finland: Sakari Rytbaebeb
- France: Alain Truffert, Head
- Jean-Yves Cloarec
- Pierre Dumont
- Norway: Ivar Foss
- Sweden: Rolf Ohlon
- United Kingdom: Dr. Jim Bell, Head
- Norman Eaton
- USA: Rolf B.F. Schumacher, Head
- Charles L. Hallam
- USSR: Dr. Vladimir P. Bulatov

Impediments

The work of our Working Group on ISO 10012, Quality assurance requirements for measuring equipment - Part 1: Management of measuring equipment, was marred by several impediments from the very beginning that turned
decisive by the Convener's apparent determination to have the standard published in 1991.

Three days had been reserved for the work of the group of which on-half day was lost right away by the convening meeting of SC2 of which WG 1 constitutes the bulk of the membership. More time than usual had to be scheduled to resolve the questions intentionally left unresolved at the 1989 meeting in Portugal.

A lapse that proved most detrimental for the depth of the deliberations and the quality for the results was the last minute arrival of all comments and change proposals, including ours. Nobody, including the Convener, had had an opportunity to read, let alone study, them before the meeting. The lack of time during the meeting then prevented their due consideration.

Our comments, with 17 pages, were most detailed and extensive. My many thanks go to all who sent in their comments and change proposals. It speaks for the expertise and the general consensus among all US respondents that, the comments were consistent with each other and with the approach reflected by ANSI/ASQC M1-1987 and the nearly completed M2. Dave Mednick of the US Army Material Command, commenting for the DoD, had submitted over 10 pages of change proposals and comments which, combined with others, with minor exceptions all became part of our final submittal. I believe our submittal was most comprehensive, reflecting the many years of experience we all had with such standards and the expertise of Task Group 1 and its correspondents. The wide diversity of comments also reflects the diversity of background and the professionalism which they contributed to the task.

Our comments and change proposals included explanations for changes, additions, and deletions which, we have reason to believe, have not been heard or considered before by a majority of the participants. Nevertheless, several novel items proposed by the US, including the requirement of a specific goal or objective of a calibration control system, were accepted.

US Concerns

The US change recommendations concerned the following:
1. Adding provisions authorizing the user of the standard to apply statistical process control methods to quantify and control measurement uncertainties and deviating, for that purpose, from specific requirements called out in the standard provided that the intent of the standard is not deviated from and that the procedures used, deviations, and underlying rationale are documented.

2. Tightening the language of the standard and making it consistent and concise so that it could serve as a contractual document.
   a. Eliminating unnecessary and, therefore, often misleading verbiage which may cause unintended enforcement problems;
   b. Giving or denying permissions for actions where it can have no power of enforcement and which are irrelevant for the purpose of the standard;
   c. Delineating more clearly who is responsible for what;
   d. Eliminating vague wordings as "where appropriate", "if necessary", "as soon as possible", etc. essentially voiding requirements.
   e. Eliminating requirements proper for a handbook on (beginners) general management, but not germane to metrology and telling management how to do their job.

3. Changing the definition used and the usage of the term "traceability" (of measurements) to include the uncertainty of values of measurement. Without reference to the uncertainty of a value, any value, however grossly it may differ from the standard, is traceable (within even grosser limits of uncertainty). The definition and application of the term in the DIS made traceability—adn, therefore, the entire purpose of the standard—meaningless, at least theoretically.

4. Correcting improper quality control methods, allocating corrective action resources to isolated sources of variability without regard to their contribution to the total and otherwise improperly making economic decisions a priori.

5. Specifying criteria for sealing.

6. Establishing that national (legal) standards of measurement must have priority over international standards.

7. Replacing an outdated appendix on adjusting calibration intervals with an up-to-date one.

8. Introducing new, valuable concepts as:
   a. Regarding measurements and calibrations as processes;
   b. Removing all reminders of the old notion that measurement uncertainties are solely caused by equipment;
   c. Requiring specific goals or objectives (quality standards) for the calibration control of measuring equipment;

The Meetings of WG 1

The meetings began with the unfortunate limitations described above under "Impediments." Nevertheless, about 2-1/2 hours were spent finding a new term for the term "metrological validation." This term was proposed a few months earlier by Peter Clifford on findings by UK labo-
ratories that the term "qualification" used earlier had been defined by the "International vocabulary of basic and general terms in metrology", the VIM, differently than intended in our standard. It became then increasingly clear that II subsequent issues could only summarily be dealt with for lack of time.

I wish again to thank all of those who responded to my question regarding the acceptability of the term "metrological validation" proposed by the Convener. Despite the awkwardness of the term, the vote was a unanimous "yes." Needed (?) was a term defined as follows:

"...The set of operations required to bring measuring equipment to a state suitable for use.

Note: normally includes calibration, any necessary adjustment or repair, subsequent recalibration, as well as sealing and labeling."

It turned out that the term "validation" was not suitable either. The term finally agreed upon was "metrological confirmation." Hence, the standard is now titled, ISO 10012 Quality assurance requirements for measuring equipment - Part 1: Metrological confirmation system for measuring equipment. whereas the English speaking countries use "calibration" for all aspects, it was held necessary to adhere to the definitions of the VIM where calibration is restricted to meaning only the comparison of a measuring instrument to a standard.

The US proposals for changes, additions, and deletions had been explained in detail and submitted with the US vote. Yet, except for the most obvious changes, most were not considered for lack of time. Hence, from the beginning there seemed no hope that this meeting could produce a standard attaining a minimum level of US acceptability. Nearly all our proposals to include statistical measurement process controls (measurement assurance methods) were quickly brushed aside as I had no help from any other delegate except from the British delegate occasionally.

With his help, our continued insistence on measurements as processes rather than equipment led to numerous small improvements, including the first-time introduction of the concept of statistical process controls for measurements in some requirements. This concept, however, remained without function in the standard.

To help us getting to know their countrymen's positions and practices, one or more of the delegates were accompanied by observers who explained their practices. It thus turned out that most delegates take positions which do not necessarily reflect the positions prevalent in their countries. some did not know what positions might be acceptable in their countries. This illustrates well the merit of the ANSI approach to standards and the requirement for representatives to be supported by a Task Group representative of their field of expertise. I am grateful to all Task Group members who helped me shape positions that stand a good chance of being widely acceptable in the US.

In view of the French opposition to the standard as written, it was proposed that the document be reclassified as a "Committee Report", not as a standard. This would prevent release of the document as a standard while reporting to the members on what had been achieved. We agreed that the document was in no shape to be released as a standard. The less-than-carefully chosen language of the requirements with extraneous instructions alone, would in our opinion disqualify it as a suitable standard. We were in disagreement with the Convener who appeared bent on finishing work on the standard at this meeting. Other delegates seemed to harbor no strong opinions one way or the other with the exception of the Danish delegate who was not present for most of the meetings as he was also the leader of the Danish delegation to TC 176. The majority of our working group sided with the Convener in their belief that the document was good enough to be released.

In a meeting of the US delegation, I obtained the unanimous support, with one abstention, for voting against 10012.1 to be accepted as a standard.

At the closing meeting of Subcommittee 3, we were joined also by Canada in voting for the French proposal. Although we had not heard much from Canada before, we are grateful for their support. The French proposal was turned down by the majority, clearing the way for the release of the ISO 10012, Part 1, as an ISO standard.

(Continued on page 78)
Ed. Note: This proceedings submittal which included slides and viewgraphs, measured about 1.2 pounds. I found it interesting to browse through it, and felt that a contents summary was called for, along with a few elaborations. If this whets your interest, you can request your own copy from Marilyn Ross, or myself, since I kept the original.

TOCPI SUMMARY

1) Accomplishments
2) National Research Council of Canada
3) Division of the Canadian Section
4) Education Initiative
5) 1990 Changes to the Volt and Ohm
6) Metrology and Its Role in the Lottery
7) Uncertainty Improvements in Low Pressure Pneumatic Deadweight Testers
8) Recent Advances in the Development of AC Voltage Calibration Techniques
9) Artifact Calibration and High Accuracy Multifunction Calibrators
10) Accreditation
11) Safety in the Workshop
12) Establishing a Metrology Laboratory
13) Controls for a Metrology Audit

To give a little flavor of the sessions, I have abstracted some sections and paragraphs from the proceedings. That, of course, saves the necessary space, but makes for fragmented reading. So be it. - Ed.

WELCOME

The 10th Annual NCSL Canadian Section workshop, Symposium and Facility Tour was held at the National Research Council Canada, Ottawa, Ontario on November 6th and 7th, 1990. The theme for this year's conference was "Metrology in TQM".

Mr. Duane Brown, Canadian Coordinator welcomed the participants and mentioned that the purpose of the conference was to bring people up-to-date on events related to the test and measurement world which have occurred over the past few years and of things to come in the world of measurement. NCSL promotes learning through the exchange of ideas. Over the last few years the NCSL through its Education Committee has taken great bounds in the survivability of the metrology discipline in Canada. But it is not good enough to say the survivability of the metrology discipline without understanding the ramifications of what we are doing by ensuring the survivability. It is not until you translate and observe metrology in action that you can begin to get the real understanding of the word metrology and the translation and observation as seen by you the majority must be expanded to include the global market place and what is happening internationally to ensure not only the survivability of metrology but the survivability of you as a company.

ACCOMPLISHMENTS

Some recent accomplishments and changes which have occurred over the past few years:

- metrology is now a recognized discipline in Canada,
- change in 1990 - change of the volt, ohm, and temperature scale,
- in 1990 Graham Cameron assumed the duties of Executive Vice President of the NCSL, in 1991 Graham will become President of NCSL. Graham was unable to attend the Workshop and Symposium because of a prior departmental commitment; however, he sent along a few words.

NCSL membership is now at the 1100 mark. The annual workshop and symposium held in Washington DC last August drew the largest attendance of any previous NCSL East Coast event (over 700).

DIVISION OF CANADIAN SECTION

The Canadian Section has been divided into five sections: Eastern Canada, Ron Mills, Michelin Tires, Nova Scotia; Province of Quebec, Adrien Michaud, Canadian Marconi; Eastern Ontario, John Joynt, Guildline Instruments; Western Ontario, Les Peer, Environment Canada and Western Canada from Manitoba to British Columbia (no
METROLOGY AND ITS ROLE IN THE LOTTERY

Mr. Scott Brown, Quantum/Westinghouse, Burlington, Ontario spoke on “Metrology and its role in the lottery.” Quantum has been involved in this business since 1975. Mr. Brown provided the audience with an informative, amusing account of how the lottery balls are tested at Quantum. Each ball involved in a lottery has to have an equal chance to win. Mr. Brown recited an accident which occurred in the United States involving a ping-pong ball used in a lottery which had been tampered with. In Canada the system used is similar to that used in France. An Indian rubber ball is used. Some of the tests involved are diametricity and rubber resistancy. A resiliometer has been used to determine the ball’s resistancy. Each ball must be x-rayed. To date Quantum has never found a ball that has been tampered with.

ACCREDITATION

A panel consisting of representatives from Standards Council of Canada, the Department of National Defence and the National Research Council discussed the technical and political content for having a laboratory recognized or accredited.

Mr. Robert Cooper, DND, began the session with the statement that DND, through NATO working groups, is working toward the development and adoption of ISO’s, but that there are some areas where complete agreement has not yet been achieved; number of tiers, method to overcome some weak areas, etc. It is likely that DND will adopt ISO’s and that a supplementary document will address DND concerns which are not covered in the parent document. ISO organization will probably be asked to strengthen their document at the next update and permit discarding the supplement. Time frame - several years.

Mr. Hysert, Standards Council of Canada, Ottawa, Ontario stated that the Council’s mandate is to:
- serve as Canada’s focal point on voluntary standardization
- represent Canada in international standardization activities
- foster voluntary standardization to improve the quality of life in Canada, and
- assist industry and Canadians in obtaining the best possible advantage of the usage of standardization.

Mr. Hysert spoke about some of the activities of the Council, including his area of expertise, accreditation.

Services and Activities of Standards Council
- Approval of national standards of Canada
- Accreditation of standards-writing organizations (SWOs)
- Accreditation of certification organizations (COs)
- Accreditation of Testing Organizations (TOs)
- Sales of international, foreign, and CGSB national standards
- Advice and information on the operation of the national standards system
- Advice and information on international standardization
- Forum for discussion among SWOs, COS, & TOs
- Represent Canada in international standardization
- Financial assistance to experts for participation in international committees on standardization
- Focal point for inquiries on standards and their use in regulatory affairs in Canada
- Technical information for manufacturers and exporters
- GATT enquiry point

Mr. Robertson, National Research Council, Ottawa, Ontario spoke on CLAS, the joint program between NRC and SCC. CLAS is the calibration laboratory assessment service. NRC performs technical calibrations, SCC does the accreditation. The results they are looking for will be a Canadian network of 20 or 30 accredited labs which will offer calibration services which have verified traceability to the primary national standards held by NRC. As mentioned by Mr. Hysert they have two labs which have been completed and there are seven that were accredited by SCC before CLAS became involved. They will be reassessing these according to CLAS criteria. They also have 13 new applicants.

SAFETY IN THE WORKSHOP

Mr. Russ Winfield, Allied Signal Aerospace/Garrett Canada, Rexdale, Ontario chaired this panel which discussed various avenues for ensuring safety in the workplace. Mr. Winfield mentioned that safety in the workplace is considered to be “old hat” to some; however, it was decided at the planning meeting that this subject would be discussed in order to highlight the changes which have taken place recently in different work places, and the new legislature now in place.

Mr. Mills, Michelin Tires, New Glasgow, Nova Scotia began his part of the presentation with the observation
that in the past ten to fifteen years the work force has become more aware of what is taking place around them. A lot of changes have taken place in the work place, for instance, Nova Scotia has provincial legislation regulating the WHMIS program. WHMIS requirements are being enforced at Michelin and information on the program is made available to the employees. Material Safety Data Sheets accompany orders at Michelin. They also have safety committees and people appointed in work areas as being responsible for safety. Laboratory staff follow safety practices.

Mr. Les Peer, Environment Canada, National Water Research Institute, Burlington, Ontario, stated that on the 31st of March 1986, all of the federal government came under part IV of the Canada Labour Code which required departments to comply with their Occupational Health and Safety guidelines. The new guidelines resulted in committees balanced between management and labour with defined terms of office.

Mr. Crampton, Ontario Hydro Research, Toronto, Ontario introduced Mr. Mike Eisner, the safety expert at their workplace. Mr. Crampton spoke briefly about safety in the home and recommended that people practice good safety habits at home as well as at work.

Shown below are the employer’s safety duties according to Bill Z08
1. Provision of equipment, materials and PD as prescribed.
2. Maintenance of all such equipment.
3. To carry out all measures and procedures as prescribed by the Act.
4. Equipment, materials, and protective devices are used as prescribed.
5. Structurally sound workplace.
6. Provide training and supervision to workers to protect their safety.
7. Appoint a competent supervisor.
8. Acquaint the worker with any hazards in the workplace.
9. Assist JH&SC.
10. Take every precaution reasonable to protect workers.
11. Have a written safety policy and develop a program to implement the policy.
12. Respond to and implement safety recommendations.

Mr. Eisner spoke about the different areas of safety, highlighting eleven specific areas:
- Hazardous Materials Management
- Management Programs
- Human Factors

Confined Spaces (External Work)
- Indoor Air Quality
- Fire Fighting Training
- Electrical
- Management Procedures (RDIs)
- Accidents/Incidents Reporting
- Environment
- Home Safety

ESTABLISHING A METROLOGY LABORATORY

Mr. Wes Lewis, Thermo Electric (Canada) Ltd., Brampton, Ontario chaired the next panel which discussed some of the problems one faces in establishing a calibration laboratory.

Mr. Karel Ebenstreit of Ontario Hydro, Tiverton, Ontario was the first panel member to speak. He gave a brief breakdown of the establishment that he is affiliated with and spoke about his experience in trying to establish a calibration laboratory. The purpose of establishing a calibration laboratory at Ontario Hydro was to be able to calibrate FNPD measuring and testing equipment that is traceable to standards. Mr. Ebenstreit spoke about two standards CSAN-286.5 (safety related equipment) and CSAZ-299.3 (spare parts).

In order to set up a calibration laboratory Mr. Ebenstreit came up with procedures of what had to be done. From studies of many documents such as AQAPS-6 and documents pertinent to calibration and control of measuring equipment. He also wrote calibration and testing procedures which describe how performance and calibration procedures are prepared, authorized, and maintained.

Mr. Ebenstreit spoke briefly about their relationship with NRC in attempting to get accredited.

Mr. Doug Thornton, Honeywell Limited, Scarborough, Ontario spoke about policies and procedures at his workplace. He wrote the calibration manual and his talk dealt with how he went about this.

Mr. S. Crampton, Ontario Hydro Research, Toronto, Ontario spoke about his facility and recent changes that have occurred. At the present time they are looking at temperature control as they are encountering problems with stabilizing the temperature. He mentioned that they are in the process of writing draft test procedures.

Mr. John Leckey, Hewlett-Packard, Mississauga, Ontario mentioned that they are in the process of redesigning
their laboratory; however, it has been taking a very long
time. He said you must start off with the right goal when
establishing a calibration laboratory; ensuring you know
what measurements you want before undertaking the
mission, establish what type of laboratory you require,
then determine who are the customers (internal and/or
external); what specifications are required and ask how
much money is involved.

Mr. Rick Weller mentioned that their mandate is to sell
Fluke and Philips products. Mr. Weller outlined how they
went about establishing what their requirements were
and then addressed the requirement. He then described
their capability.

CONTROLS FOR A METROLOGY AUDIT

Mr. George Parker, Litton Systems and Mr. Roy Maddox,
Tektronix gave the following joint presentation on “Con-
trols for a Metrology Audit.”

One unalienable fact to remember, when notification that
there is to be an upcoming audit has been received, is that
the audit is a perfect public relations forum and an
excellent chance for free publicity. It takes a while to
establish credibility and only a moment to destroy it. So
know the requirement against which the audit is to be
performed and prepare by fulfilling the requirements
accordingly. Rest assured the auditor will be preparing
also. Request a copy of audit procedures from the Auditor.
He may want a copy of your procedures beforehand.
Whatever the audit, there are basic steps which are
followed by any auditor:

1. The establishment of requirement criteria and scope.
The documentation need not be elaborate, but it must be
established and maintained to be consistent with imple-
mented practice. Works from top down in modular form.

Write a procedure manual—document before implementa-
tion if starting from scratch but most will have proce-
dures in place but not documented. Write procedure to
the need.

Maintain distribution list and keep everyone updated on
all changes.

Write in procedures for software control. Procedures
should be written with wide enough scope to cover all
contingencies.

2. The review of documentation satisfies the criteria
and scope.

Satisfy the function—Why did failure occur? If a failure—
why did it fail? Determine what to do for long-term fix, not
bandaid.

Review the need for calibration. Use Limited calibration
stickers—but write in manual. Limited cal stickers can
cut cost. Calibrate to manufacturer’s manual or to the
extent required. Example: variable oscillator but used
only at one frequency, i.e., 1 kHz. Set to Frequency used
and seal unit and use limited calibration stickers.

3. Verification of the practical implementation of the
documented procedures. Use self audit following AQAP-
6 guidelines, Standards Council of Canada check list, MIL
STD 45662, etc.

Be sure to include Software controls.

Whatever the documentation required to satisfy the crite-
ria involved, it should primarily be written to satisfy the
Function for which it is written, as proposed to merely
satisfying the stated criteria or standard requirement. A
good auditor will be able to recognize either situation and
provide judgment accordingly.

Honesty and audit assistance will pay dividends in many
ways—one of which is fast acceptance of the presented
system in satisfying the audit criteria. Remember, the
auditor is there to ensure the audit criteria are satisfied
and to assist in achieving that goal, not merely to sub-
jectively embarrass. He or she is just as human as any
auditee and has a responsibility to fulfill. Attitudes will
be rejected in kind, and within the audit report written to
objectively state if and how the audit criteria are met.

Be proud of “Your System”, ensure to the best of your
ability that it satisfies the requirements and present it as
satisfying the function for which it was written.

The audit will then confirm the latter to the benefit of the
audited organization.

Hence

-Know the requirements
-Document their satisfaction
-Implement and maintain that documentation to be
consistent with practice
-Use the audit to assist in the establishment of
“Metrology Excellence”

(Continued on page 68)
NIST RESISTANCE CALIBRATION UNCERTAINTIES REDUCED

On January 1, 1990, NIST implemented a new national standard of resistance based on the quantized Hall effect and the use of the internationally adopted value for the von Klitzing constant, $R_{K,90} = 25812.807 \, \Omega$ exactly. As a consequence of this process, the implementation of new measurement systems, and changes to existing systems, the uncertainties with which resistance standards can be measured have been reduced. The results of analyzing these uncertainties are given in the table below. The various components of uncertainty have been combined using the convention recommended by the International Bureau of Weights and Measures (BIPM) Working Group on the Statement of Uncertainties (See Metrologia, vol. 17, No. 2, p. 73 (1981) with $K=3$. These uncertainties are effective beginning January 1, 1991.

<table>
<thead>
<tr>
<th>Test Number</th>
<th>Nominal Resistance $(\Omega)$</th>
<th>Maximum Power (mW)</th>
<th>Prior Uncertainty (ppm)</th>
<th>New Uncertainty (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>51130C</td>
<td>1 (Thomas)</td>
<td>1</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>51131C</td>
<td>$10^4$ (Special)</td>
<td>10</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>51132C</td>
<td>$10^{-4}$</td>
<td>100</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>51133C</td>
<td>$10^{-3}$</td>
<td>100</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>51134C</td>
<td>$10^{-2}$</td>
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</tr>
<tr>
<td>51137C</td>
<td>10</td>
<td>50</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
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<td>$10^2$</td>
<td>10</td>
<td>4</td>
<td>1</td>
</tr>
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</tr>
<tr>
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<td>$10^5$</td>
<td>10</td>
<td>10</td>
<td>3</td>
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<td>51142C</td>
<td>$10^6$</td>
<td>10</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>51143C</td>
<td>$10^7$</td>
<td>*</td>
<td>20-2000</td>
<td>20-1000</td>
</tr>
<tr>
<td>51145C</td>
<td>$10^8$</td>
<td>*</td>
<td>100-2000</td>
<td>50-1000</td>
</tr>
<tr>
<td>51147C</td>
<td>$10^9$</td>
<td>*</td>
<td>2000</td>
<td>200-1000</td>
</tr>
<tr>
<td>51149C</td>
<td>$10^{10}$</td>
<td>*</td>
<td>2000</td>
<td>1000</td>
</tr>
<tr>
<td>51151C</td>
<td>$10^{11}$</td>
<td>*</td>
<td>2000</td>
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<tr>
<td>51153C</td>
<td>$10^{12}$</td>
<td>*</td>
<td>2000</td>
<td>2000</td>
</tr>
</tbody>
</table>

* Resistors at this level are tested at customer-specified voltages.

Resistors in the range from $10^{-4} \, \Omega$ to $10^{6} \, \Omega$ are measured four-terminally. For resistance levels above $100 \, \Omega$, two- and four-terminal values are indistinguishable at present levels of uncertainty. All other measurements are two-terminal.

It should be noted that these uncertainties apply only to the calibration of resistance standards by NIST and accordingly reflect only the short-term performance of these standards. An assessment of the uncertainties applicable to their use in another laboratory must include consideration of their drift and the effects of transporting them, as well as the measurement uncertainties of the using laboratory.

For further information, contact Ronald F. Dzuiba, (301) 975-4239.
ALTERNATIVES TO NIST ACCREDITATION OF U.S. CALIBRATION LABORATORIES

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American Association for Laboratory Accreditation
656 Quince Orchard Road
Gaithersburg, MD 10878
January 14, 1991

ABSTRACT

The demonstration and maintenance of traceability of calibrations in the United States has been the responsibility of the users of laboratory services. The defense agencies have established procedures for assuring traceability of their own calibration services, using on-site assessments, checklists, and requiring duplicate calibrations to check performance. All, of course, using equipment or reference materials traceable to the National Measurement System, either through NIST or by use of basic measurement devices.

The Defense Department (and NASA and several other government agencies), using a different oversight mechanism, then provides on-site review of calibration services of the original equipment manufacturers (OEM's), who in turn provide oversight of their subcontractors. Sometimes major subcontractors have their own system of oversight for their suppliers.

We often hear criticism from Europe and “Australasia” that we do not have a central calibration service so that the basic underpinning of our measurement system, calibration, is suspect. In reality, we have many different calibration services, some of which are more complex and sophisticated than most of the central systems in other countries and some of which simply go through the motions. It is not that we don't have a system; it is that we have multiple systems.

The knowledge and skill to assess calibration laboratories is clearly available in the private sector. Government intrusion is not necessary. What is needed however, is a central focal point of these private sector services, and assessment of the quality, and agreement to recognize each other's work so that we can minimize the duplicate calibration laboratory assessments that now take place. Such a coordinated effort would also provide a focal point for attesting to calibration laboratory quality to industry as a whole, government agencies, and foreign agencies who have neither the time nor the interest in evaluating all the current U.S. alternatives. This focal point could also be recognized in new legislation as is done in the health care and clinical laboratory field where laboratory accreditation programs operated by a number of professional societies are recognized through procedures provided in the law.

BACKGROUND

The National Institute of Standards and Technology (NIST) has had before it for over ten years proposals for developing a calibration laboratory accreditation program through its accreditation agency, the National Voluntary Laboratory Accreditation Program (NVLAP). Scientists at NIST for the most part have resisted the concept, stressing the need to statistically demonstrate the relationship between the calibration capability of NIST and that of the applicant agency.

There has been a basic concern as well over a conflict in NIST's basic mission perceived by many at NIST to be to perform research and develop new methods for improving the quality and accuracy of measurement processes, not to act as a regulatory agency over all the nation's calibration laboratories.

In 1979, a request for a NVLAP microwave calibration program was received and seriously acted upon by 1985. The result of that work was summarized in a paper written for the IEEE, “Measurement Assurance and Accreditation,” Proceedings of the IEEE, Vol. 74, No. 1, January 1986. Only electromagnetic power, attenuation, and reflection coefficient calibrations were involved. Applicants would have had to participate in a measurement assurance program costing $436,000 to develop. The five applicants declined to contribute, and the program did not move forward.

The issue of the cost of programs at NIST is significant. Recently, there is a requirement that laboratories testing asbestos in schools be accredited by NIST; NIST was, in effect, designated as a regulatory agency since the laboratories cannot do business in this area except with accreditation by NIST.

The cost for accreditation of laboratories for one test, polarized light microscopy, is $3,500. A second test method has been added, transmission electron microscopy, at an additional cost of $8,500.

Other efforts at NIST related to calibration have evolved over the years. There were efforts undertaken by the Center for Radiation Research with the Health Physics Society in the radiation measurements area. The Office of Weights and Measures developed a program to accredit
states' weight and measures laboratories. This program has its own accreditation process and is not part of the NVLAP system.

There are again suggestions that NIST develop a program. However, there are some viable alternatives.

ALTERNATIVES TO NIST

1. One alternative would be for existing laboratory accreditation systems to develop a cooperative program for recognizing programs of equivalent requirements. The NCSL is in a strong position to develop this alternative since most of the high performance calibration laboratories are members. The program would consist of review and assessment of existing calibration accreditation systems for minimum requirements followed by mutual recognition of those laboratories accredited. In a sense, this is the Accreditor of Accreditors concept which has been in operation in the health care industry for almost 20 years.

2. A version of this might be for NIST to accredit existing accreditation systems which meet specified standards. This role has recently been spelled out for NIST in the fastener legislation (PL 101-592), where NIST is directed to recognize both foreign and domestic accreditation systems meeting requirements essentially equivalent to their own. This legislation in section 6(a) requires NIST to "issue regulations which shall include:

   (A) procedures and conditions ... for the accreditation by the Institute of laboratories engaged in the inspection and testing of fasteners;

   (B) procedures and conditions which shall be consistent with the procedures and conditions established under ... (A) using, to the extent practicable the requirements of national or international consensus documents intended to govern the operation of accreditation bodies, under which private entities may apply for approval by the Secretary to engage directly in the accreditation of laboratories in accordance with the requirements of this act."

This may be the ideal situation in that much of the capability already in existence can be quickly harnessed to provide the calibration recognition some believe is so necessary.

3. Another type of program is the National Aerospace and Defense Contractors Accreditation Program (NADCAP). In this program, NADCAP hires assessors to monitor each calibration site and the users of data from that site agree to accept the findings of that assessor.

4. A2LA itself offers still another alternative, developed around existing international systems. The A2LA program requirements are based on the ISO/IEC Guide 25, "General Requirements for the Competence of Calibration and Testing Laboratories" (new title of the proposed revision) augmented with specific additional requirements appropriate to calibration laboratories. At present, the program is based on the 1982 version of ISO/IEC Guide 25, but the Association is actively considering changing the procedures to the newly revised Guide 25 as soon as it is published. The A2LA Accreditation Process and Specific Requirements are available from A2LA on request. A2LA has held some discussions with NIST about the development of a cooperative program which would promote NIST accreditation of "primary" calibration laboratories while A2LA would focus its program on the accreditation of "secondary" calibration laboratories. The definition of primary and secondary would relate to the magnitude of the uncertainties to which each type of laboratory could calibrate.

NEED FOR GOVERNMENT INVOLVEMENT

There is a common assumption by some parties in the United States that government must run the accreditation program before it is accepted internationally. This assumption is made despite the fact that some of the systems in Europe (e.g., the Netherlands) are being privatized and others (e.g., NATO in Australia and SCC in Canada) are associations like A2LA, but with a Federal charter.

Some say that governmental systems in other countries will not be willing to enter into agreement except through a U.S. governmental entity. A2LA has not found that to be the case, having recently entered into a Memorandum of Understanding with the Government of Hong Kong (which also has an MOU with NAMAS of the United Kingdom).

Most importantly, systems in other countries do not want to have to deal with multiple systems in the United States. Thus, an alternative described above could serve as the U.S. host, and we are convinced, based on our experience, that acceptance by other countries would be readily obtained as long as the U.S. system was reasonably equivalent to these other systems. One basis for judging that equivalence is ISO Guides 54 and 55: "Test Laboratory Accreditation Systems: General Recommendations for Accreditation Bodies and General Recommendation for operation." A2LA claims compliance with both of these standards.

Perhaps an even more fundamental question is: will the U.S. governmental agencies accept these alternatives? This has been a key argument advanced by a number of

(Continued on page 50)
BIOMEDICAL & PHARMACEUTICAL METROLOGY
COMMITTEE QUARTERLY REPORT

Enclosed are the minutes of the Biomedical & Pharmaceutical Metrology Committee meeting held on December 6, 1990.

During the meeting, we discussed the name of this committee and also the charter of the Medical Instrumentation Committee, just being formed. The attendees at this meeting felt that the present name, although comprehensive, was too long. It was also felt that the challenges facing the medical instrumentation people are very similar to ours and having two committees so similar, is self defeating.

We propose that the Biomedical & Pharmaceutical Metrology Committee & the Medical Instrumentation committee be combined and a shorter name developed that reflects the makeup and needs of the committee members. Possibly the name could be changed to Food & Health Care.

Doug Smith's workload will not allow him to continue as chairman of this committee.

Meeting Minutes

A meeting was held on December 6 at the Nutrasweet R&D facility, Mt. Prospect, IL, hosted by Stan Chytla. There were 14 participants.

Using the published agenda as a guide, useful and interesting discussions were held on a wide range of topics throughout the day.

An informal poll was conducted on the use of control charts and experiences and benefits of their use. Parameters presently being charted included: test weights, SPRT data, standard cells, gage blocks, and SRM glass filters. The data was used to demonstrate that a process was in control, select the most stable set of gage blocks, and to extend calibration intervals by predicting variations.

An action item given each participant was to begin charting and to be prepared to discuss experiences and results at the annual NCSL Conference in August.

Frank Uttaro of MKS Instruments led a discussion and review of the results of a vacuum MAP conducted by committee members in 1988. Plans are in progress for a second vacuum MAP to be conducted in 1991 with MKS again acting as the pivot lab and supplying the vacuum transducers. The kickoff meeting will be held the third week in March at the MKS Chicago facility. This half day meeting will cover measurement techniques, data collection, and the logistics of moving the standards from one location to another.

The enthusiasm generated by the vacuum MAP was expanded to include other measurement areas of interest.

Three other MAP's are being planned for 1991. The first is an air flow MAP in the range of 50-200 CFM and is being coordinated by Darrell Klein of Searle. Discussions have started with Norman Meese of NIST and a search is in progress for a suitable transfer standard.

A second MAP being planned is a mass MAP with Abbott Labs acting as the pivot lab. This will be a repeat of a Midwest NEMAP that several of the members had already participated in.

The last MAP being planned is a pipette MAP in the range of 10-1000 microliters. Dave Duff of Lilly will supply the artifacts and will coordinate the MAP. This MAP followed discussions on two methods of calibrating pipettes, namely a gravimetric method and an acid base titration method. Accuracy, sources of error, time requirements, costs, operator training, and equipment requirements were discussed for each method. Also included was a discussion on the perceived accuracy requirements of research personnel using the pipettes. In general, it was felt that pipettes with a calibrated accuracy of 2-3% of the range met most requirements.

A number of issues were raised during the general discussion period. Although not focused, they initiated healthy discussions and pointed to areas of concern to metrology personnel. Topics included: calibration of timers and stopwatches, applying serial numbers to thermocouples and RTD's, calibration and validation of cold boxes and stability cabinets, humidity measurements in confined spaces, humidity sensor calibration methods and specmanship, and process calibrations, sensor versus system.

The Committee is again planning to develop a session for the NCSL Conference in August.

Additional information on any of the topics covered can be obtained by calling Doug Smith at Abbott Laboratories.

Ralph Bertermann
Acting Chairman
AD HOC COMMITTEE ON THE CHANGE OF THE TEMPERATURE SCALE

We had very good attendance at our workshop on the ITS-90 at the NCSL annual meeting in Washington in August of last year. In addition to the workshop, we also held a Committee meeting during the NCSL meeting. At that Committee meeting, three members agreed to write a short paper on the ITS-90 for some trade journals aimed at technician-level readers in order to further publicize the change of the temperature scale.

Since the NCSL meeting, NIST Technical Note 1285, "Guidelines for Realizing the International Temperature Scale of 1990 (ITS-90)," has been published and approximately 3500 copies have been distributed. Twelve hundred copies were sent to NCSL headquarters.

Two documents, "Supplementary Information for the ITS-90" and "Techniques for Approximating the ITS-90," have been prepared by the CCT and either are in the process of being published or have already been published by the BIPM. These documents are now, or very shortly will be, available for purchase from the BIPM.

I want to take this opportunity to remind every interested party again of the 7th International Symposium on Temperature, Its Measurement and Control in Science and Industry, to be held in Toronto, Canada, April 28-May 1, 1992.

B. W. Mangum, Chairman

INTERNATIONAL TRACEABILITY COMMITTEE

Documentation of International Compatibility of NIST Standards

The project plans and progress to date were reviewed at the January meeting, including the database of collected papers, the proposed publication format and contents, and the interim availability of information from the database in software or hardcopy. In order to develop the most effective document possible, NIST would like to have feedback from the committee members about how you plan to use the document in discussions with your inspectors or customers to justify the acceptance or compatibility of measurement services traceable to national standards of a country other than that of the point of sale. We plan to reproduce the full text of the original papers along with the summary document. The main question is how much information should be included in the summary to be most effective but not too distracting to your discussions. Two examples of the database entries follow:

FILE NUMBER: IT0004

REFERENCE NUMBER:

CATALOG NUMBER: 37010 - 37130

PARAMETER: Luminous intensity and luminous flux

DIVISION: 534

TYPE: International comparison

NATIONAL LABS: BIPM, CSIRO (Australia), ETL (Japan), IEN (Italy, INM France), INTI (Rep. Argentina), IOM (Spain), NIST (USA), NIM (People's Rep. China), NPL (United Kingdom), NPL (South Africa), NRC (Canada), OFMET (Switzerland), PTB (Fed. Rep. Germany), VNIIOFI (USSR).

AUTHORS: J. Bonhoure


TITLE: Photometric Standards of the National Laboratories

ABSTRACT: A new definition of the candela was adopted in 1979 by the 16th Conférence Générale des Poids et Mesures. After allowing time for the national laboratories to establish their own new realizations of the candela and lumen, the Comité International des Poids et Mesures (CIPM) in 1985 organized international comparisons at the Bureau International des Poids et Mesures (BIPM) to check the uniformity of the results of photometric measurements obtained with the new definition of the candela. But, at the time of the comparisons, several national laboratories and the BIPM were continuing to base their calibration services on photometric standards that were not in agreement with the new definition of the candela. The aim of Table 1 is to give a clear account of the present status of photometric standards used as the basis for calibration services.

FILE NUMBER: IT0007

REFERENCE NUMBER:

CATALOG NUMBER: 10010

PARAMETER: Length - Iodine-stabilized Helium-Neon Lasers

DIVISION: 731
in the works. Hal will attend the board meeting to report further on his committee's activities.

Tony Anderson, VP Operations

TRAINING INFORMATION DIRECTORY
COMMITTEE NOTICE

The Training Information Directory Committee would appreciate your assistance in soliciting information on educational materials and training courses for the 1992 Training Information Directory. Bob Willett has suggested that Regional and Section Coordinators announce this need as part of their agenda at regional meetings as well as identify an E&T person from each Section. Thank you.

Dave Lorenzen, Chairman

CALIBRATION SYSTEMS COMMITTEE

The salary survey was distributed by the Secretariat to the U.S. membership in September. The Secretariat will forward the completed surveys to me for compilation. A total of 308 completed survey sheets were returned for a respectable 28%. When we finish the compilation, we publish results in the Newsletter.

The Calibration Reports Subcommittee will be distributing draft-2 of the proposed RP in November. The committee met in Anaheim at Rockwell International on January 29-30 to incorporate feedback from committee members. At the Board meeting in Santa Barbara, Lewis Fong or myself briefed the board on any updates.

The committee has taken on the task to coordinate and publish the Calibration Laboratory Manager's Guidebook. We hope to publish in 1991.

The committee has also submitted its Long Range Plan inputs to the Executive Vice President.

Phil McRury, Chairman

AUTOMATIC TEST AND CALIBRATION COMMITTEE

The committee membership list, generated in 1989, has been retrieved. Invitations were mailed to all former members to attend a meeting of the committee at the MSC.

PUBLICITY & MARKETING COMMITTEE

Hal Stitt is appointed as Publicity Chairman to replace Alan Herman. With this appointment the activities of the Conference Publicity Committee have been combined with the Marketing Publicity Committee under one chairman. The second and third editions of NCSL Corner appeared in the December and February issues of Test and Measurement World and the article for the April edition is already

Joe D. Simmons, NIST

* * * * *
At the meeting a format for cataloging calibration procedures for use by the membership will be presented. My plan is to finalize the catalog format and procedures at that time and have it ready for the next board meeting. If approved, we will then proceed to produce a recommended procedure to legitimize the process.

Dave Nebel, Chairman

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MEASUREMENT ASSURANCE PROGRAM COMMITTEE

1. The 10 Volt JJ round robin has begun and the first laboratory is just about finishing their measurements. Five laboratories are involved. Completion is expected this summer. POC: Jim McKinnon 619-545-9723 and Steve Stahley 317-782-4601.

2. The RF Power round robin has begun in northern Texas. TI Laboratories and a HP service center are participants. POC: Clyde Orrison 214-995-5032.

3. The Second Fiber Optic Power Measurement round robin is in the developing stage. This effort will tentatively measure power at the two longer (standard) wavelengths at different power levels. Mr. Tom Scott of NIST has agreed to support this effort. POC: Kas Rangan 408-756-0277.

4. The ARFTG Measurement Comparison Program is now taking place. To date, ten laboratories have completed the 3.5 mm round robin and two laboratories have completed the 2.9mm round robin. The measurements are the S-parameters of passive one and two port devices similar to Vector Network Analyzers verification kits. If you are interested in being involved in this round robin, please contact the following people:

   Over-all Program: Bob Judish (303-497-3380)
   7mm Clyde Orrison (214-995-5032)
   3.5 mm Dave Hopping (707-577-4029)
   2.9 mm Steve Frei (408-788-2000x4293)

5. The Thread Gage round robin in the Minnesota (Twin Cities) area should be complete soon, if not already. Preliminary data has been returned to participants that have completed their measurements. POC: Rick Brion 612-892-4271.

6. The Biomedical & Pharmaceutical Metrology Committee has completed a vacuum MAP and is planning a second effort in 1991. Three new MAP efforts are being planned for 1991. These include Air Flow, Mass, and Pipette. These particular MAP efforts are targeting the Food and Health Care Industry and are being directed toward current technology and regulatory issues. POC: Doug Smith 708-937-4929.

7. A Gage Block round robin has just been completed that included fourteen laboratories. The blocks are currently at NIST for final measurements and results will be available to participants after TRW completes the analysis. This is the fourth effort by this group, but the first with NCSL support. POC: Jack Edison 714-773-7746.

8. A Pitch Diameter (Thread Gage) round robin was completed in May, 1990, and a second effort is planned for mid-1991. POC: Jack Edison 714-773-7746.

9. A Coordinate Measuring Machine (CMM) round robin effort is in the developing stage. NCSL has agreed to support this effort. The following statement and questionnaire comes from Dr. Steven Phillips (NIST) 301-975-3565. (You also may contact B. Borchardt 301-975-3469. (See statement below).

10. Mr. Ron Eubanks (Region 6) is investigating the feasibility of starting a CMM round robin in his area. If you are interested, please give him a call. 214-418-4034.

11. Comments from the Chairperson: It appears that laboratories are concerned about good measurements and their measurement processes. Round Robin and MAP efforts may be occurring in your area; please contact any of the above or myself if you are interested in participating.

ANSI/ASME Committee to Study Interim CMM Testing

As the number and average age of Coordinate Measuring Machines (CMMs) increase, the need for the periodic testing (daily, weekly, or monthly) of CMM performance has developed. Accordingly, the B89.4 (formerly B89.1.12) committee on Methods of Performance Evaluation of Coordinate Measuring Machines has recently created a new working group (B89.4.13) to study the needs and methods of interim (between calibration) testing of CMMs. The working group hopes to provide guidelines for the use of interim testing of CMMs, inform users of potential problems that may occur between normal CMM calibrations, and investigate procedures and artifacts that can be used for interim CMM checks. As a preliminary effort to determine the interim testing techniques currently in use, the working group is conducting a survey of CMM users and manufacturers. NCSL members who are involved in this field are invited to take part by copying and returning the questionnaire on the following page to this address: ASME, Secretary, c/o B89.4.13 Survey, 345 East 47 Street, New York, NY 10017.

Mike Cruz, Chairman

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NATIONAL MEASUREMENT REQUIREMENTS COMMITTEE

Initial inputs from NIST have been received for all the information for the DC/Low Frequency portion of the 1991 report appendix which presents individual needs and NIST plans. An NMRC meeting is planned to discuss these inputs and to formulate the main body of the 1991 NMRC report. This meeting will be held following the conclusion of the MSC conference in Anaheim on February 1 at the Disneyland Hotel. The primary thrust of the meeting will be to finalize the format and, as much as possible, the content of both the appendix and main body of the 1991 Report.

The draft of a letter commending the authors of the recently published NIST Technical Note, TN1265, "Guidelines for Realizing the International Temperature Scale of 1990 (ITS-90)" has been prepared. This draft letter also comments on some shortcomings of the TN.

Laurie Baker, Chairman

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INTRINSIC/DERIVED STANDARDS COMMITTEE

During the last quarter, several inputs were obtained for the catalogue of intrinsic/derived standards. The overall catalogue will be updated in time for the next committee meeting. In addition, the latest draft copies of WG1, Josephson Voltage Standard, and WG2, Triple Point of Water, will be circulated for discussion at the next committee meeting. A conference room was set up in conjunction with the Measurement Science Conference for our next committee meeting.

Dr. Richard Pettit, Chairman

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TQM COMMITTEE ON CALIBRATION SYSTEMS REQUIREMENTS REPORT

Since the last board of Director's meeting, the committee activities have concentrated on staffing the committee with representatives from government and industry. Ten new members have been added to the committee and we now have representation from six government agencies. We've made contact with the Nuclear Regulatory Commission and participation looks probable. Bob Willett is continuing to work with the FAA.

Our replacement for Dave Mednick as of this writing has not been named, however, the U.S. Army Missile Command is supposed to have representation at our February meeting.

Ira Epstein, Assistant Director, Office of International Standards, Office of Secretary of Defense, has agreed to become involved and help us with the international aspects of this committee's work. This is particularly important with international adoption of I.S.O. 10012.1, Quality Assurance Requirements for Measuring Equipment, which is very similar to MIL-C-45662, and viewed by many committee members as obsolete.

I made a presentation to the NCSL Region 4 meeting, Orlando, November 1, 1990. In general, they were in favor of a single U.S. Standard and laboratory accreditation provided it is recognized by all U.S. Agencies.

I also conducted a workshop at the Region 8 LA/Valley Section. They were in concert with the other regions except they thought laboratory accreditation should be accomplished by a combination of government and the private sector.

On January 16, 1991, Joe Simmons and I attended the Aerospace Industries Association (AIA), WSC#1 Metrology & Calibration Quality Assurance Committee meeting, at Boeing, Seattle, Washington. Alan Painter is the new committee chairman. Joe and I made presentations and led discussions on international standards and this committee's work and asked for AIA involvement—they agreed.

Our activities will be presented to the AIA Quality Assurance committee at a meeting the end of this month. The WSC#1 committee decided they would also develop a position on MIL-STD-45662A.

Committee Staffing

*Abbott Laboratories  
*Brylen Technologies  
*Consumers Power Co.  
*Defense Logistics Agency (DLA)  
*General Electric Service  
*Hewlett Packard  
*Hughes Aircraft Co.  
*JcAIR, Inc.  
*Lockheed Missiles & Space  
*NASA  
*NIST  
*NCSL  
*Office of Sec. of Defense  
*Rockwell International  
*Sanda Nat'l Laboratories  
*Sverdrup Technologies  

Doug Smith  
Barbara Jenks  
Jack Ferris  
Aristides Maldonado  
Rick Randall  
Dave Abell  
Bill Quigley  
Bob Willett  
Bob Weber  
Robert Burdine  
Joe Simmons  
George Rice  
Frank Tracinski  
Dennis Pinnerker  
Ralph T. Johnson, Jr.  
William Simmons
UTILITIES COMMITTEE REPORT

The Utilities Committee held its annual meeting 29 and 30 January 91 at Southern California Edison.

Discussion sessions were held on Technician Training documentation, and EMI effects on humans and what is the Utility industry doing in this area. Al Hammonds from SCE presented a very informative talk/discussion of NUPIC and their current position. NUPIC is a joint effort by all 52 Nuclear utilities to access and utilize vendor audits of other utilities.

A very wel-received presentation was given by Dr. Mangum from NIST on the ITS-90 and Mr. George Burns discussed Thermocouples and the forthcoming set of tables for ITS-90 curves for them. Both of these were informative and timely for this industry as several of us are in the gearing up stage for operation on ITS-90.

A tour of SCE's Shop Services and Instrumentation Division had to be one of the highlights of this conference. This is an impressive facility and well worth the time to witness a professionally-established calibration facility. Another highlight was the excellent noon meals furnished by SCE. Bob Horton and his folks did an excellent job of hosting this conference.

The 1992 Utilities Conference is scheduled for this same location. Details have to be worked out, but it will be in conjunction with the 1992 Measurement Sciences Conference. For further information about the Utilities Committee, call me at (704) 875-5767.

Gary M. Shuler, Chairman

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LABORATORY FACILITIES COMMITTEE REPORT


2. The Committee is tentatively scheduled to meet again during May 1991 at Duke Power Company, Huntersville, NC. Specific dates for the meeting will be provided at a later date. Additional inputs to the rewrite will be formalized at that time.

3. Member inputs to the RP-7 rewrite are desired, along with comments on material already available.

W. H. Fitzgerald, Chairman

Minutes

1. A meeting of the Laboratory Facility Committee, National Conference of Standards Laboratories, was held in Santa Fe, NM, 23-25 January 1991. The meeting's purpose was to review input revisions to the current RP-7 "Metrology Laboratory Design Guide" and determine what additional material was required. It is necessary to assure inclusion of functional capabilities and environmental controls in any current or newly constructed laboratories.

Those in attendance included:

Walter H. Fitzgerald, Naval Weapons Station, Corona, CA, Chairman
Henry L. Daneman, HDL Associates, Santa Fe, NM
Ray E. Lindey, Duke Power, Huntersville, NC
Charles O. McMurry, Redstone Arsenal, Huntsville, AL
Franklin S. Bandy, United Industries, Springfield, VA
William Dubyk, KMI, Claremont, CA
Donald A. Coggan, Consultant, Outremont, Quebec

The highlights of the meeting were:

1. Documents provided by committee members for inclusion in revised RP-7.
2. Review of proposed content and format of revised RP-7.
3. Committee definitions of calibration laboratory echelon.
4. Environmental conditions/limitations recommended for each laboratory type.

2. A number of documents were provided at the meeting which will be incorporated, all or in part, into the revised RP-7. These included:

C. McMurry - MIS-35236 “Specification for Environmental Enclosure Laboratory System”

F. Bandy - Laboratory Areas for:
   a. Backlog and Storage
   b. Office Areas
   c. Computer Room
   d. Computer/Electronic Parts Repair
   e. Training and Conference Room
   f. Outside Utility Pad

W. Dubyk
   a. Modular Laboratory
   b. Instrument Service Area
   c. Electrical and Electronic Equipment Cleaning and Washing
   d. Measurement Environmental Control Summary Table for Type I, II, III, and IV Laboratories

3. The committee noted that the environmental considerations previously planned for inclusion in the revised RP-7 did not align precisely with those selected in RP-9. The current issue of RP-9 (Recommended Practice: Calibration Laboratory Capability Documentation Guideline), July 19, 1989. Since this document’s aim is one for uniformity, it was decided that the revised RP-7 would include all of the measurement areas listed in RP-9, namely:

   DC/Low Frequency
   RF/Microwave/MW
   Electro-optics
   Thermal/Pressure
   Flow
   Chemical/Analytical

The sequence of measurement areas, their combinations, and the measurement parameters within these measurement areas would be arranged to conform to the physical facility arrangements required for calibration laboratories.

Other characteristics listed in RP-9 which are suggested for inclusion in laboratory capabilities, and which are planned for the RP-7 inclusion include:
   a. audits performed by outside agencies
   b. on-site calibration capabilities
   c. repair capability
   d. laboratory mission statement (laboratory types)

4. The committee determined that the environmental requirements for the various measurement areas and their parameters would be listed for five echelons or accuracy levels of laboratories. These are defined as follows:

   Ed note: These are provisional, and not approved.

   a. National Laboratory: has custody of and maintains the highest legal measurement standards in the country. Provides primary standards intercomparison with the standards for lower echelon laboratories.

   b. Primary Laboratory: has custody of and maintains the highest level of primary measurement standards for a specific government, industrial, or military organizational group, i.e., U.S. Air Force. Standards utilized by the Type B lab are calibrated and certified by comparison to the standards in the Type A lab. Level Type B laboratories provide calibration services to lower echelon ones, usually operating in a fixed facility.

   c. Secondary Laboratory: has custody of and employs the primary standards calibrated by either the Type A or B laboratory. Its standards in turn are used on lower echelon laboratory standards, and on customer general purpose test equipment. This activity generally operates at a fixed site.

   d. Calibration Laboratory: has maintenance responsibility and use of standards calibrated by Type A, B, or C laboratories. These standards are applied to calibrate working standards, which in turn calibrate working measuring equipment, customer general purpose test equipment, or standards of Type E laboratories. This facility is usually at a fixed site, but may be mobile.

   e. Field Laboratory: responsible for the maintenance of standards calibrated by Type A, B, C, or D laboratories. These standards calibrate general purpose test equipment, gages, fixture, and special test equipment. This type frequently works at the customer’s on-site location at ambient conditions.
It is noted that the Western European Calibration Conference (WECC) has devised a definition for type A, B, C, and D echelon laboratories. As soon as this definition is available, the above definitions will be modified to insure agreement with that devised by the WECC.

5. Environmental Conditions/Limitations Recommended for each Laboratory Type.

The committee had lengthy discussions and inputs on the values of environmental conditions to be applied to each laboratory parameter/type. The initial compilation is summarized in the attachment, "Chart of Recommended Environments for Standards Laboratories". This initial effort was limited to the environmental conditions for the Measurement Area "DC/Low Frequency". Committee members have been assigned other measurement areas, and will input the recommended environmental conditions for those areas. Assignments previously made stand, with the addition of Mr. Coggan who is to prepare the Glossary.

Ed. Note: An attachment summarized recommended environmental limits.

REPORT OF VISIT TO THE NATIONAL PHYSICAL LABORATORY, TEDDINGTON, ENGLAND, 16 NOVEMBER 1990

The National Physical Laboratory, Teddington, Middlesex, United Kingdom, TW110 LW, was visited on 16 November 1990. The purpose of the visit was to exchange information on the design and environmental controls required for metrology laboratories. It was particularly desired to obtain new applicable information not now available to the Metrology Engineering Center at Corona, CA. This new material could be incorporated in existing documents on the design of Navy Type I, II, and III laboratories, as well as the Field Calibration Activities. The material could also be applicable for inclusion of a current revision to the National Conference of Standards Laboratories Information Manual RP-7, "Recommended Practices of Laboratory Design."

The contact at the National Physical Laboratory was Benjamin Hughes, Physical Scientist. He is an assistant to D.J. Pugh, Manager of the reference standard group, Division of Mechanical and Optical Metrology. Mr. Hughes was provided copies of the U.S. Navy documents describing the design of Navy Type I and II laboratories, namely: "Calibration Facility Requirements for shore Based Navy Calibration Laboratories", NAVAIR 17-35FR-02, dated 1 November 1989, and "Calibration Facility Requirements for Navy Type I and II Standards Laboratories", NAVAIR 17-35FR-04, dated 1 December 1989.

The National Physical Laboratory provided copies of the following:


A brochure was obtained on the United Kingdom National Measurement Accreditation Service (NAMAS), a service of NPL. NAMAS assesses, accredits, and monitors calibration and testing laboratories. These laboratories are then authorized to issue formal certificates and reports to conduct specific types of measurements and tests. NAMAS develops uniform accreditation practices which facilitates the acceptance of British goods and services in the Single European Market in 1992 and in the overseas market. In many cases, certification of calibration laboratories is and will be a condition of product acceptance.

Other information obtained included:

a) The present NPL mechanical standards laboratory building was built in 1900. A new one has been planned and designed, but not funded.
b) The humidity in the NPL mechanical standards area is maintained at 50 ± 5%, with personnel comfort the determining factor. It does require oil coating of exposed steel gage blocks and instruments.
c) Because of mechanical laboratories location and bedrock foundation, vibration is not a problem with measurement operations.
d) A laser interferometry gage block calibration developed by NPL is now being produced and sold by TESA Metrology Ltd., P.O. Box 418, Halesfield 8, Telford, Shropshire TF7, 4QN, U.K. Under development is an improved model using two different laser frequencies which permits more accurate and rapid reading. Its platen holds 14 gage blocks for rapid calibration sequencing after temperature stabilization.
e) Laboratory temperature measurements are made and recorded automatically every two minutes to insure the 20° ± 0.1° C in the gage block calibration area.


William DuByk, KML/SYS
Claremont, CA
CALIBRATION REPORTS COMMITTEE

The fourth team meeting of the Calibration Reports Subcommittee was held on January 29-30, 1991 at Rockwell International in Anaheim, California. Discussion and incorporation of Draft-2 Recommended Practice (RP) feedback, and establishment of a "straw-man" Draft-3 RP were accomplished.

Attendees:
Joe Corege, Hewlett-Packard
Lewis Fong, Lockheed Missiles & Space
Bob Judish, NIST
Ken Lund, Rockwell International
Bernie Rand, Navy Primary Standards Lab
Bud Stott, John Fluke Manufacturing

The team's Mission and Goals were reviewed, a summary of the 16-17 August 1991 meeting was conducted, and a status review of all past Action Items indicated 100% closure. Following a group discussion on Draft-2 RP structure, the team agreed to merge and incorporate the Draft-2 RP "Data-Reporting Measurement Results" section into the Draft-3 RP "Technical Information" section. The team agreed to continue to take a neutral position on RP measurement uncertainty information. The Draft-2 RP feedback process carried over to the next meeting day, and the "straw-man" Draft-3 RP was established.

Terms for the RP's "Terminology and Definitions" section were identified, discussed, and called for further tasks that were agreed upon to be addressed by an Action Item.

Members of the Calibration Reports Subcommittee would like to thank all reviewers of Draft-2 RP. NCSC membership RP feedback have been invaluable. In July 1991, Draft-3 RP will be available for review and feedback. If you want to get involved, review Draft-3 RP, or attend a Subcommittee meeting, please call (Calibrations Reports Subcommittee Chairperson) Lewis A. Fong at (408) 756-3534.

Lewis Fong, Chairman

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SUMMARY REPORT OF THE GAITHERSBURG MEETING OF THE TQM COMMITTEE ON CALIBRATION SYSTEM REQUIREMENTS

The meeting of the TQM Committee on Calibration system Requirements, an NIST Standing Committee, was held at NIST in Gaithersburg, MD on February 19 and 20, 1991.

The general purpose was:
1. To pull together as many different U.S. agencies as possible to determine the possibility/feasibility of develop-
WELCOME TO OUR NEW NCSL MEMBERS

REGION 2

Organon Inc.
W. Orange, NJ 07052
Delegate:
Klaus J. Engelmann
(201) 325-4740

Oscilloscope Services, Inc.
Houston, TX 77007
Delegate:
David D. Sanders
(713) 645-2029

Transcat Cal Lab
Houston, TX 77058
Delegate:
Dale Young
(713) 498-8226

U. S. Instrument Rentals
D.F.W Airport, TX 75261
Delegate:
John G. Reeve
(214) 456-4014

Varco – Drilling Systems
Orange, CA 92668
Delegate:
Tibor Torna
(714) 978-1900

REGION 3

American Electronice Labs Inc.
Falls Church, VA 22042
Delegate:
Tom Hettenhouzer
(703) 573-8240

REGION 5

Martin Marietta Energy Sys., Inc.
Piketon, OH 45661
Delegate:
D. W. Rogers
(614) 897-2331

Mead Central Research
Chillicothe, OH 45601
Delegate:
Richard S. Goodlin
(513) 772-3503 x3651

Raytheon Semiconductor Division
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Technical Services Group
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REGION 6

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William Lambert
(917) 497-7693

Caltronics
Mesquite, TX 75150
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Glen R. Tolleson
(214) 613-1523

Dallas Semiconductor
Dallas, TX 75244-3292
Delegate:
Steven L. Cannell
(214) 450-3727

Motorola Inc.
Seguin, TX 78155
Delegate:
Tiburio V. Guerrero
(512) 372-7314

REGION 8

DynAir Tech of Arizona
Phoenix, AZ 85034
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Bart Lewis
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Delegate:
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Pacesetter Systems
Sylmar, CA 91321
Delegate:
Tim Shannon
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Puritan-Bennett Corp.
Carlsbad, CA 92009
Delegate:
Gary Archer
(619) 438-4138 x445

REGION 10

F. Ulrich Gauge Laboratory, Inc.
Lachine, Que. H9T 3G9 Canada
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Riyadh, 11471 Saudi Arabia
Delegate:
Fawzi H. Hakeem
4793332

Underwriters’ Labs of Canada
Scarborough, Ont. M1R 3A9 Canada
Delegate:
Brian Kitamura

REGION 11

Alliant Techsystems
New Brighton, MN 55112
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Lewis M. Casey
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Calser Corporation
Belleville, IL 62222
Delegate:
Thomas R. Gagen
(618) 277-0329

Organics/LaGrange, Inc.
Chicago, IL 60626
Delegate:
Francisco L. Torres-Figueras
(312) 764-6700

Siemens Stromberg-Carson
Albuquerque, NM 87123
Delegate:
Robert M. Clement
(505) 291-5054
LOWER BOUND PROPERTIES FROM MATERIAL TEST DATA PERFORMED

Monte Carlo simulations were performed at the David Taylor Research Center (DTRC) to determine how the accuracy of lower bound values estimated from experimental data is influenced by sample size, required confidence level, and assumed statistical model. Population distributions having different degrees of skewness, selected to bracket those expected in actual experimental data, were studied. For nearly every case considered, lower bound estimates calculated using Log-Normal statistics were more accurate than estimates calculated using either Normal or Weibull statistics.

It was demonstrated that testing more than three samples per condition can greatly reduce the error associated with the lower bound estimate. However, after the twelfth sample, no additional sample will reduce the lower bound estimation error by more than 2.5 percent for all statistical distribution/confidence level combinations considered. When applied to material properties for which the population distribution has been established by previous testing, it was demonstrated that a Monte Carlo simulation can be used to assess the maximum expected lower bound estimation error as a function of sample size and confidence level. This information can be used to determine the minimum number of specimens needed to obtain a lower bound estimate of acceptable accuracy when sampling a known population.

From Navy Technology Transfer Fact Sheet

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CALL FOR PAPERS

THE 7TH INTERNATIONAL SYMPOSIUM ON TEMPERATURE—ITS MEASUREMENT AND CONTROL IN SCIENCE AND INDUSTRY
April 28-May 1, 1992
Toronto, Ontario, Canada

Papers are solicited on all of the following topics:
Thermodynamic Thermometry
Temperature Scales
Fixed Points
Electronic Thermometry
Noise Thermometry
Resistance Thermometry
Radiation & Spectroscopic Thermometry
Thermistor Thermometry
Thermocouple Thermometry
Calibration Methods
Dynamic and Transient Thermometry
Instrumentation and Data Analysis
Uncertainties and Statistics
Temperature Control
Cryogenic Thermometry
Geophysical Thermometry
Harsh Environment Thermometry
Medical and Biological Thermometry
Space and Astrophysics Thermometry
Instrumentation Exhibits
Instrumentation Poster Sessions

Deadlines: By June 15, 1991, submit a short summary or abstract of the work (not exceeding 500 words) to:
Program Chairman
7th Temperature Symposium
Room B128, Physics Building
National Institute of Standards & Technology
Gaithersburg, MD 20899

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EC HOTLINE ESTABLISHED

The Office of Standards Code and Information (SCI) has established an EC hotline to report on draft European standards developed by the European Committee on Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC) and the European Telecommunications Standards Institute (ETSI).

The hotline, which can be reached by calling (301) 921-4164, also reports on standards-related EC directives identified from the Official Journal of the European Communities. The recorded message is updated weekly and includes information on how to obtain copies of the documents. U.S. exporters and manufacturers are encouraged to obtain copies and review draft European standards of interest to them. Comments will be directed to the appropriate organization for consideration.

For further information contact the National Center for Standards and Certification Information/SCI, NIST, Admin. Bldg., Room A629, Gaithersburg, MD 20899; (301) 975-4038.

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CALL FOR PAPERS

1992 MEASUREMENT SCIENCE CONFERENCE
Theme for 1992- Striving for Global Metrology
January 30-31, 1992
Disneyland Hotel
Anaheim, CA

Authors

You are invited to participate in the 1992 conference by presenting an original paper in one of the topics listed or a related subject. Please notify the program chairman as soon as possible of your interest. The deadline for submitting your abstract of not more than 200 words is May 15, 1991. Please include your name, address, telephone number, and a short biographical sketch with your abstract.

Session Developers

If you are interested in developing a technical session in one of these or a related topic, please notify the program chairman prior to the May 15 deadline. Send your name, address, telephone number and a short biographical sketch to the program chairman and indicate your area of interest.

Topics Include

Metrology and Quality Assurance
Process Control/Measurement Control
Productivity and Quality
Propagation of Uncertainties
International Traceability
Developments at NIST
Automation of Calibration
Computer Applications in the Laboratory
Technical Disciplines including
Electro Mechanical
Dimension/Linear
Time and Frequency
Electro Optics
Microwave/Millimeter Wave
AC/DC/Low Frequency
Statistics/SPC

Respond to:
John Gerhard, Program Chairman
ROCKWELL INTL HC02
P.O. Box 3105
Anaheim, CA 92803

* * *

HP PARTS NUMBER CROSS-REFERENCE

Once again, the latest issue of the Hewlett-Packard BENCH BRIEFS service publication provides a 33-page listing of HP semiconductor part numbers cross-referenced to a manufacturer part number. Everyone knows that it's best to use recommended supplier numbers, but sometimes time is critical and local supplies can be used with such a list.

If you're not already on the circulation list, write:
Hewlett-Packard BENCH BRIEFS
Worldwide Support Operation
100 Mayfield Ave.
Mt. View, CA 94043

* * *

CALIBRATED BENDER DEVELOPED

During the course of developing and testing undersea fiber optic cables, a tool was developed by the Naval Ocean systems Center (NOSC), San Diego, California, to aid in inspection, repair, and failure analysis of deployed cable. This tool can be used with a diver or remotely operated vehicle (ROV) to assist in locating faults in small diameter undersea fiber optic cables. It can also be used in the laboratory or cable manufacturing plant to determine the location (relative to a known point) of a point of interest. Once the tool is calibrated, it can be used as an optical attenuator.
The tool consists of two sets of cylindrical fingers disposed in an interdigital relationship, pivoted together, scissors fashion, to receive a portion of an optical fiber cable. When the fingers are rotated to a closed position, they create a predetermined series of bends in the portion of the optical fiber cable that can be observed by an optical time domain reflectometer. This observation allows a remote monitor to determine the relative location of the bends with respect to a suspected break or other anomaly in the optical fiber cable so that a maintenance or repair crew can go directly to the location of the anomaly for quick action. The device can be applied directly to equipment or systems using fiber optic cables as interconnections. It will aid in fault localization and other position determination requirements.

from U.S. Navy Technology Transfer Fact Sheet.

ALTERNATIVES TO NIST ACCREDITATION
(Continued from page 37)

NCSL participants about the A2LA program. This argument suggests that A2LA's program would just be another program to add to the existing multitude of programs. That, of course, could happen, if the private sector does not consolidate its opinion and support a selected system. A2LA experience is that effective systems can obtain government recognition. For example, A2LA accreditations are recognized by the Defense Industrial Supply Center, by the U.S. Environmental Protection Agency, and its 1990 Directory of Accredited Laboratories carries an Adoption Notice approved by the Department of Defense.

Many agencies operate their own laboratory accreditation systems. Although the Interagency Committee on Standards Policy has advised government agencies to use private sector systems which meet the provisions of ASTM E994 "Guide for Laboratory Accreditation Systems" wherever possible, most agencies in recent times basically ignore that advice (e.g., the Customs system, the Drug Enforcement Agency system, and OSHA's National Recognized Testing Laboratory system). They have also resisted use of NIST's NVLAP program. The main reason that these agencies can create their own program is that there is not public consensus on a reasonable alternative. Should any of the alternatives be chosen, and be strongly supported by the calibration community, acceptance would be very probably. Acceptance and support by the affected community is the key to any program, whether it be a NIST program or one of the alternatives suggested.

Whatever the alternative chosen, cooperation with research and basic calibration functions at NIST will be essential: NIST would serve as the basis for reference to the basic measurements. It might also serve as a technical resource and possibly serve as an arbiter or appeal agency.

John W. Locke
President, A2LA

CALL FOR PAPERS
1992 TEMPERATURE SYMPOSIUM

Abstracts for the 1992 Temperature Symposium are due by June 15, 1991. All abstracts should be mailed to Dr. James F. Schooley, NIST, Bldg. 221, Room B128, Gaithersburg, MD, 20899. The Temperature Symposium is scheduled for April 28 through May 1, 1992, at the Toronto Convention Center, Toronto, Canada.
COMPETITIVENESS PROBLEMS CAN BE OVERCOME

U.S. companies' technology-related competitiveness problems show up as difficulties in quality, cost of goods, and speed to market—but these problems can and are being overcome, John W. Lyons, director of NIST, said recently. “Too often our companies are not the first with new product lines, nor do they have the best quality or lowest cost. The result is a loss of competitive edge to companies overseas,” Lyons told the Society of Manufacturing Engineers’ “Composites in Manufacturing 10” conference in Anaheim, Calif. “If that’s the bad news, it also is the good news,” Lyons said, “because these are weaknesses that the United States and U.S. technology leaders . . . are fully capable of correcting. These are problems for which there are remedies, remedies we are beginning to see take effect in the marketplace as America awakens to our technology challenges.” Lyons explained how NIST is helping industry address these problems.

Contact: Mat Heyman, 301/975-2762

GAUGING MMIC MEASUREMENT NEEDS

Fancy a cheap, on-board radar for your car that would help avoid collisions? How about a low-cost TV satellite antenna about the size of a salad bowl to replace today’s bulky, expensive “dishes?” Electronics engineers envision these and many other potential products as the result of monolithic microwave integrated circuit (MMIC) technology now taking shape in government and industrial labs. But before these miracle devices can be successfully developed commercially, there are numerous obstacles, largely measurement related, to overcome. NIST researchers are tackling many of these problems through in-house programs and team projects with outside groups. MMIC devices need standardized, precision-engineered components to ensure that devices from different companies can be integrated into working systems. NIST has launched a government/industry consortium to establish needed national MMIC standards. This group also is examining problems such as how to reliably gauge temperature in a MMIC circuit and how to best measure the characteristics that promote quality control in MMIC device production.

Contact: Fred McGehan (Boulder), 303/497-3246

NEW METHOD PREDICTS PRODUCT FIRE RISK

Combining traditional methods of analyzing a product’s fire risk with powerful new computing tools, a team of researchers from NIST’s Center for Fire Research and private industry has developed a new way to measure the life-safety risk of a combustible product. The method can predict whether fire fatalities would increase or decrease if a product’s fire performance characteristics were changed. The $1,000,000 project was funded by a consortium of manufacturers and trade associations through the National Fire Protection Research Foundation. The new technique uses HAZARD I, a computer model developed by NIST, together with statistics on past fires and information from fire tests. Combining all of these methods allows researchers and others to predict not only the probability and outcome of an individual fire, but also to sketch a picture of fires involving a particular product on a national scale. A series of reports describing the method and ways to use it is available from the National Fire Protection Research Foundation, 1 Batterymarch Park, Quincy, MA 02269.

Contact: Jan Kosko, 301/975-2762

MANUFACTURING TECHNOLOGY CENTERS HELPING BUSINESS

NIST’s Manufacturing Technology Centers program is off to a promising start toward improving the technological competitiveness of small and mid-sized businesses, the NIST Visiting Committee on Advanced Technology said in a report to Commerce Secretary Robert A. Mosbacher. The centers are intended to bridge the gap between sources of manufacturing technology and the companies that need it. The nine-member committee praised the technology-transfer efforts of the New York, Ohio, and South Carolina centers, noting local business support for such efforts as direct project assistance, technical training courses, and demonstrations of hardware and software. The report, Manufacturing Technology Centers Program, looks at the program strategies, operations, and financial support of the three centers. Available from Dale E. Hall, A527 Administration Bldg., NIST, Gaithersburg, MD 20899, 301/975-2158.

Contact: John G. Blair, 301/975-2762
USE OF STATISTICS IMPROVES PRODUCT QUALITY CHECK

Making quality-control measurements on a product often requires use of a test method which in turn must be calibrated against a more cumbersome but more reliable test method. The manufacturer must decide on appropriate limits for the measured quantity that strike a balance between the risk of accidentally accepting bad products and the risk of rejecting good products. An understanding of statistics is necessary to allow for the contribution of error in the measurement process and in the instrument calibration, and to assign reasonable limits to balance the two competing risks. NIST researchers recently assisted the National Particleboard Association in analyzing its procedures for testing particleboard for formaldehyde emission levels. Formaldehyde is a necessary ingredient in the bonding agent for particleboard, but the Department of Housing and Urban Development requires that product emissions be kept below 0.3 parts per million.

Contact: Michael Baum, 301/975-2762

CURRENT SUPPLY DESIGNED FOR HIGH-Tc TESTING

Precise and accurate measurement of the DC critical current of high-critical-temperature (high-Tc) superconductors often puts stringent demands on the current supply. A simple and inexpensive design for such a current supply has been developed by NIST, based on a common deep-cycle, 12-V, wet-cell battery of the type used in boats and recreational vehicles. A description of the circuit, including the diagram, was published in Measurement Science and Technology, Vol. 1 (1990). Reprints are available from Steven Bray, Div. 724.05, NIST, Boulder, CO 80303, 303/497-5631.

Contact: Collier Smith (Boulder), 303/497-3198

1991 QUALITY AWARD APPLICATION RELEASED

Applications are available for the 1991 Malcolm Baldrige National Quality Award. The award is given to U.S. companies in recognition of their achievements in quality management. Firms applying for the award must undergo a rigorous evaluation by an independent board of examiners composed of private-and public-sector experts in quality. The deadline for submitting the application is April 3, 1991. The application form is part of a 43-page booklet. 1992 Application Guidelines, which also includes a description of the award, detailed instructions and recommendations for applicants, and specifics about the scoring criteria and evaluation. Single copies of the guidelines are available at no cost from the Malcolm Baldrige National Quality Award office, A537 Administration Bldg., NIST, Gaithersburg, MD 20899, 301/975-2036, fax: 301/948-3716. Multiple copies in packets of 10 are available for $20 per packet from the American Society for Quality Control, Customer Service Dept., 310 W. Wisconsin Ave., Milwaukee, WI 53203, 800/248-1946, fax: 414/272-1734.

Contact: Jan Kosko, 301/975-2762

NSA AND NIST COMPUTER SECURITY PROJECT ANNOUNCED

The National Security Agency's (NSA) National Computer Security Center and NIST's National Computer Systems Laboratory will work together to develop new criteria for evaluating the security of computer systems. Expected to last at least 2 years, this effort will lead to a new Federal Information Processing Standard, or FIPS, to specify computer security requirements for federal systems that process unclassified information. NIST and NSA will examine the applicability of the well-established U.S. Department of Defense "Trusted Computer System Evaluation Criteria" for the systems networking environment and will take into account the migration toward an open systems distributed environment. User and vendor experiences with existing trusted systems will be studied and will influence the direction of the new criteria. Also to be examined are various alternatives for evaluating products and determining their conformance to specified requirements.

Contact: John Makulowich, 301/975-2762

CRYOGENIC PROPERTIES OF COPPER

NIST and the International Copper Association (ICA) have developed a new chart presenting technical data on the properties of copper at cryogenic (super-cold) temperatures. Copper's excellent low-temperature resistivity, thermal conductivity, and reasonable mechanical properties have made it the metal of choice for numerous low-temperature applications in high-energy physics, fusion energy devices, and space experiments. As a result, the initial chart, produced in 1979, received wide distribution. The new chart is larger and contains more information, particularly on copper alloys and magnetic properties. Other properties presented include electrical resistivity, thermal conductivity, thermal diffusivity, fatigue, and specific heat/thermal expansion coefficient. Free copies of the chart are available from Fred Fickett, Div. 724.05, NIST, Boulder, CO 80303, or ICA, 708 Third Ave., New, NY 10017.

Contact: Fred McGahan (Boulder), 303/497-3246.
PATENT ISSUED FOR "STANDARD CRACK"

NIST researchers have received a patent for a reference standard and a method for manufacturing that standard for use in calibrating eddy current testing systems. These systems are used by the airline industry, among others, to detect cracks and other signs of metal fatigue in aircraft. Until now, a difficulty of the eddy current technique has been the lack of well-defined "flaws" that accurately simulate fatigue cracks. Thomas E. Capobianco of NIST's Electromagnetic Technology Division, Boulder, Colo., and his collaborators have produced a reference standard from a block of metal that is deformed by an indentation tool to provide a notch of prescribed dimensions. The reference standard is composed to close the notch and can then be used to calibrate an eddy current measurement system. For licensing information contact Bruce Mattson, Office of Technology Commercialization, A343 Physics Bldg., Gaithersburg, MD 20899. For more information on the standard, contact Thomas Capobianco, Div. 724.05, NIST, Boulder, CO 80303, 303/497-3141.

Contact: Fred McGehan (Boulder), 303/497-3246.

NIST/ASME TO HOLD PRESSURE VESSEL WORKSHOP

NIST and the American Society of Mechanical Engineers are co-sponsoring a public workshop on pressure vessels to obtain information and recommendations on how the federal government can assist producers in gaining product acceptance within international markets such as the European community. Comments are sought to determine the federal role in conformity assessment related activities such as testing, certification, accreditation, and quality assurance. The pressure vessel workshop is the first of a series by NIST in various product sectors. It will be held 9:30 a.m., Jan. 31, 1991, Rm. 4830, U.S. Dept. of Commerce, 14th and Constitution Ave. NW, Washington, DC 20230. For information and to reserve space, write to Bert G. Simson, Office of Standards Services, A603 Administration Bldg., NIST, Gaithersburg, MD 20899, 301/975-4006.

Contact: Roger Rensberger, 301/975-2762

PRESIDENT'S 1992 BUDGET SEEKS INCREASE FOR NIST

The President's fiscal year 1992 budget request of $248 million for NIST represents a $33-million, or 15-percent, increase over the agency's current appropriation of $215 million. According to NIST Director John W. Lyons, the request reflects the agency's continuing efforts to aggressively expand its research programs in support of U.S. industry in the economically important areas of electronics, advanced materials, computers, communications, industrial chemical technology, and manufacturing. The FY 1992 request includes $201.8 million for intramural laboratory research and supporting services, and $46.2 million for extramural programs, including $35.0 million for the Advanced Technology Program and $10.3 million for the Manufacturing Technology Centers Program.

Contact: Roger Rensberger, 301/975-2762

MICROSTRIP PATCH ANTENNA DEVELOPED

Calibration laboratories will be interested in a new development from NIST that makes certain antenna measurements and electromagnetic interference/compatibility tests more convenient. NIST researchers have developed a small (20 cm square) microstrip patch antenna that can be used as a standard transmitting and receiving antenna at frequencies below 500 MHz in an anechoic chamber. Up to now, well-characterized pyramidal horns and open-ended waveguides have been used, but at frequencies below 500 MHz, these instruments become very large and impractical. NIST researchers proved that the resonant frequency, driving point impedance, antenna radiation pattern, and radiated field strength of the microstrip patch antenna could be calculated theoretically from its geometry and are accurate to within three percent. Paper no. 2-91 describes the antenna in detail and is available from Jo Emery, Div. 104, NIST, Boulder, CO 80303, 303/497-3237.

Contact: Fred McGehan (Boulder), 303/497-3246

CRITERIA FOR ACCREDITING FASTENER TESTING LABORATORIES

Public Law 101-592, the Fastener Quality Act, was signed into law by President Bush on November 16, 1990. The law requires that critical fasteners (e.g., high-strength aircraft bolts and nuts) conform to the specifications to which they are represented, and provides for the accreditation of testing laboratories to certify this conformance. NIST, through its National Voluntary Laboratory Accreditation Program (NVLAP), is charged with developing and administering the accreditation program for fastener testing laboratories. The mechanical properties and performance group of the Metallurgy Division has accepted the responsibility for establishing the technical criteria which NVLAP will use to assess candidate laboratories. Samuel R. Low and T. Robert Shives will review the current specifications for the many categories of fasteners that are covered by the act and will draft procedures for evaluating the capabilities of laboratories for carrying out the standard mechanical test methods cited in these specifications. They will also design proficiency test programs to serve as part of the evaluation procedures. Regulations governing the accreditation of fastener testing laboratories are expected to be announced in May 1991.

Contact: Leonard Mordfin, 301/975-6168
CAPABILITY ESTABLISHED FOR QUANTIZED HALL RESISTOR FABRICATION AT NIST

Under the direction of Kevin C. Lee, CEEE's Electricity Division has completed a fabrication and test laboratory for quantized Hall resistors and fabricated structures that appear to be of world-class (i.e., standards) quality following preliminary evaluation in the research quantum Hall resistance (QHR) facility. These Hall-bar structures were etched from gallium arsenide wafers having gallium arsenide-aluminum gallium arsenide heterostructures formed by the Semiconductor Electronics Division's molecular beam epitaxy system. Thus NIST now has the capability to produce its own high-quality QHR resistance standard and for research.

Although NIST counterpart laboratories and others are taking steps to address the supply issue, heretofore there have been few high-quality QHR specimens available. The new Electricity Division laboratory provides a cleanliness level of class 10 and incorporates a mask aligner, an alloy station for etching and forming low resistance indium or tin-alloyed contacts, and a probe station and related equipment for evaluating specimens as they are made. Cleanliness is vital, as any dirt on the specimen can give rise to a barrier layer that will prevent current for flowing through the structure at the liquid-helium temperatures and high-magnetic fields at which it is used. The full process of certifying that the NIST-prepared structures are of standards quality will take about a year and requires many determinations, including the temperature stability of the resistance and the dependence of resistance on magnetic field. A byproduct of the laboratory's operation will be information expected to be useful to industry concerning the fabrication of heterostructures and contacts and their behavior at very low temperatures.

Contact: Alan F. Clark, 301/975-2319

COLLABORATION WITH INDUSTRY ON THE DEVELOPMENT OF A FASTENER WORKSTATION

CME's Automation Production Technology Division has begun a joint R&D project with the Portsmouth Naval Shipyard in collaboration with industry to develop an automated fastener workstation in the AMRF. Precision fasteners used in such critical applications as aircraft and submarines must conform to federal and industrial standards for accuracy and performance. Besides meeting such criteria, the fasteners must meet material traceability requirements as well. The joint R&D effort involves the development of the technology, methodology, and computer control systems necessary for the production of highly accurate fasteners. These fasteners are now manufactured from both k-monel and nickel copper material, which are excellent for their resistance to corrosion. However, this type of fastener is expensive to produce because the high tolerances specified for the parts requires frequent inspection at different stages of the production process. An automated fastener workstation would offer a significant reduction in production time as well as cost. These objectives can be achieved by using a multipindle, multiturret turning/machining center for the increase in production efficiency, while integrating statistical process control and in-process inspection into the overall manufacturing process, thus enhancing quality control.

Kang Lee, 301/975-6602

COME TO THE ANNUAL WEIGHTS AND MEASURES CONFERENCE

The 76th Annual Meeting of the National Conference on Weights and Measures (NCWM) will be held at the Four Seasons Hotel on Logan Square in Philadelphia, PA during the week of July 13-19, 1991.

The NCWM develops technical, legal, and general recommendations in the field of weights and measures administration, regulation, and technology, and its programs explore the entire area of this economically important segment of government measurement services.

Additional information regarding the annual meeting may be obtained by contacting the NIST Office of Weights and Measures at (301) 975-4004.

There will be laboratory metrology workshops at the annual meeting. Optional evening discussion sessions will include "The Future of Laboratory Metrology: Professionalism, Training, & Organizations" and "Computers in the Laboratory: Hardware, Software, and Testing." Technical training for laboratory metrology is also tentatively being planned for Thursday and Friday, following the meeting. The tentative topics include Measurement Error analysis, and Advanced Weighing Designs.

Contact: Georgia Harris (301) 975-4014

NIST SIGNS RESEARCH ASSOCIATE AGREEMENT WITH PRATT AND WHITNEY

NIST has signed a Research Associate Agreement with Pratt & Whitney Company Inc. for NIST's Precision Engineering Division to test a laser-based measuring instrument designed to measure cylinders, balls, and gage blocks. The
stated accuracy of the instrument is 2 microinches (50 nanometers). The dimensional metrology will work closely with Pratt & Whitney engineers to test their current model and to assist in the design of their next generation instrument.

Contact: Ted Doiron, (301) 975-3472

WORKSHOP ON EXPERIMENT DESIGN FOR SCIENTISTS AND ENGINEERS

A workshop, "Experiment Design for Scientists and Engineers," was held at NIST on November 26-30, 1990. Instructors James Filliben, Raghu Kacker, and Eric Lagergren of NIST along with J. Stuart Hunter of Princeton, presented the latest statistical design techniques for improving product and process quality. Twenty-four scientists and engineers from regional industries participated. Half of the participants had quality assurance responsibilities and one-third were product and process engineers.

The workshop covered comparative designs, full and fractional factorial designs, response surface methods, and Taguchi's approaches to reducing undesirable variability. The participants expressed a need for similar NIST workshops on advanced experiment design, Taguchi methods, experiments with mixtures, and other related subjects.

Contact: Eric Lagergren (301) 975-3245

SESSION ON INTERNATIONAL QUALITY AND RELIABILITY STANDARDS PLANNED

In response to the recent international emphasis on the development and use of quality and reliability standards, particularly in Europe, NIST's Keith Eberhardt is organizing an invited paper session on this topic for the August 1991 Joint Statistical Meetings. The session is sponsored by the American Statistical Association's Committee on National and International Statistical Standards, of which Eberhardt is the program chair. The speakers will include two statisticians from private industry in Europe who will discuss progress in international standardization of verification and evaluation procedures and statistical methods for 21st century standards on reliability growth.

Contact: Keith Eberhardt, (301) 975-2683

HEBNER ELECTED PRESIDENT OF IEEE DIELECTRICS AND INSULATION SOCIETY

The Institute of Electrical and Electronics Engineers (IEEE) Dielectrics and Electrical Insulation Society (DEIS) has elected CEEC Acting Deputy Director Robert E. Hebner President of DEIS for 1991. DEIS, with approximately 2,500 members, develops and promulgates voluntary standards for the testing of dielectric and annually, and publishes a research journal and a technical magazine. Hebner also received the 1990 IEEE Harry Diamond Award for "development of electrical measurements and standards for the nation's electric power system.

Contact: Judson C. French (301) 975-2220

OIML COMMITTEE MEETING

The International Committee of Legal Metrology (CIML) met in Porto, Portugal, Oct. 2-5, 1990. Representatives of 38 of the 50 OIML member nations participated in the meeting.

The following OIML recommendations for measuring instruments were approved: high-precision lime measures of length, indicating pressure, pressure-vacuum, and vacuum gauges; recording pressure-vacuum, and vacuum gauges; load cells (revision); atomic absorption spectrometers for measuring metal pollutants in water; and instruments for measuring vehicle exhaust emissions.

Contact: Samuel Chappell (301) 975-4024

ASTM ACCEPTANCE OF NIST-DEVELOPED INTERLABORATORY TEST SOFTWARE

NIST researchers have developed a PC-computer program to evaluate interlaboratory tests, which should lead to greater uniformity in the evaluation and reporting of different standard methods.

Working with the ASTM Subcommittee E-11.04 on Development and Evaluation of Test Methods, NIST researchers designed a computer package which consists of the PC software, a 40-page users' manual, and a reprint of the parent ASTM standard E691-87 for evaluating interlaboratory results. The package is available at nominal cost from ASTM.

For each material for the interlaboratory study, the program examines both the individual data points for within- and between-laboratory variabilities, and derives summary within- and between-laboratory components of precision for the complete study. Computer graphics play a prominent role in the evaluation and the reporting of the data. The program produces tables and graphs for screen or hard copy.

Contact: (301) 975-4516
NIST IS MAJOR PARTICIPANT AT CALS EXPO ‘90

NIST played a prominent role in the recent CALS EXPO ‘90 held in Dallas. Computer-aided Acquisition Logistic Support (CALS) is a Department of Defense (DOD) and industry program to substantially improve productivity and quality through the use of digital technical information. NIST has supported the CALS program since 1985 in the development and implementation of data interchange and related information technology standards. Robert White, Department of Commerce Under secretary for Technology, was one of the keynote speakers.

A recently signed memorandum of understanding between DOD and the Department of Commerce was announced at the EXPO. This document underscores the importance of government and industry cooperation in the development of product data standards.

Contact: Sandy Ressler (301) 975-3549
        Roy Morgan (301) 975-3254

SPECIAL ROBOTICS ISSUE OF “IEEE SYSTEMS, MAN, AND CYBERNETICS”

Martin Herman of NIST’s Robot Systems Division served as a guest associate editor of a special issue of the “IEEE Transactions on Systems, Man, and Cybernetics,” published November/December 1990. The three other guest editors for the issue were from George Mason University and the University of Tennessee. The issue had as its topic unmanned vehicle and intelligent robotic systems and contained 21 papers that dealt with various aspects of robotic systems design.

One paper described a spatial mapping system that provides a model of the underwater environment suitable for autonomous navigation. Other papers in the issue described research in autonomous and teleoperated vehicles, sensor processing, path planning and navigation, manipulator control, and world modeling.

Contact: Martin Herman, (301) 975-3441

NIST DEVELOPS NOVEL TURBULENCE DIAGNOSTIC, WITH THE UNIVERSITY OF MARYLAND

W. M. Pitts of NIST and colleagues K. C. Muck and J. M. Wallace of the University of Maryland have produced a new technique for characterizing turbulent flow fields. This technique combines two unique instruments. The first is a line camera, that uses Rayleigh light scattering to measure species concentration. The second, located just downstream, is an array of fine hot-wire anemometers. The combination enables simultaneous, real-time multipoint measurements of concentration and velocity along a line. Using the technique, the team has demonstrated the importance of organized large-scale motions to the turbulent mixing process. The work also shows that there are periods during which the fluid near the perimeter of a turbulent jet is simply convected by an external coflow. A report of this work will appear in Applications of Laser Techniques in Fluid Mechanics (Springer-Verlag, 1991).

Contact: William Pitts, (301) 975-6486

JAPANESE-AMERICAN RESEARCH QUALITY ENGINEERING METHODS

The NIST Statistical Engineering Division and the Instrumentation Mathematics Section of the Japanese National Research Laboratory of Metrology share the common goal of better experimental methods for engineers. In pursuit of this goal, Water Liggett of NIST spent 1990 in Tsuchi, Japan, visiting this section under the auspices of the Foreign Researcher Invitation Program. The focus of his visit was experimental methods for quality engineering of molded products.

During the year, two aspects of parameter design experiments were considered. One was statistical plans that are explicit yet cover successive measurement steps. The other was improved data analysis to take advantage of the large number of measurements typically prescribed in the designs used by this section. Liggett demonstrated how planning could anticipate the production of items that are too imperfect to be measured and how to detect conflicting requirements on the setting of control factors. The problem of conflicting requirements was illustrated with tensile strength measurements. The two groups plan further exchange of visits in pursuit of their common goal.

Contact: Water Liggett, (301) 975-2661

NEW LASER TELEMETRY DOSIMETRY SYSTEM DEVELOPED

A long-range laser-based system for the remote detection and dose quantitation of gamma-ray and x-ray radiation fields has been developed in the NIST Ionizing Radiation Division. The system will allow on-line measurements in high-dose environments such as nuclear power plants and radiation processing facilities. It employs GaChromatic™ dosimetry media, a radiosensitive film that upon exposure to ionizing radiation, visibly darkens as a function of dose, and a helium-neon laser operating at the wavelength of 632.8 nanometers. The film is "read" by measuring the transmitted light intensity of an incident beam and converting that quantity to an optical density, thus yielding an optical density versus dose relationship. With the present film, the applicable dose range is 1 to 1000 gray. (One gray
[Gy] is equal to one joule per kilogram.) The basic system can be configured for realtime, on-line monitoring of radiation procedures in industrial radiation processing as well as other industrial and military applications. This research received an R&D 100 Award this year.

Contact: Marlon L. Walker, 301/975-5593

AC IMPEDANCE METHOD MEASURES HIGH RESISTIVITY SILICON INGOTS AND SLICES

W. Robert Thurber, Jeremiah R. Lowney, and James R. Ehrstein of CEEE's Semiconductor Electronics Division, and Robert D. Larrabee of CME's Precision Engineering Division have developed an AC impedance method for measuring the bulk resistivity of high resistivity silicon ingots and slices. The method is nondestructive in character and only requires that easily removable contacts, such as may be formed from silver paint, be applied to the end faces of the specimen crystal.

In the method, the impedance of the paint-crystal-paint capacitive sandwich is measured as a function of frequency from 100 Hz to 40 MHz. The resistivity is then calculated from the frequency at which the negative peak occurs in a plot of the imaginary component of the impedance at that frequency. In addition to its intended application for measuring bulk resistivity, the method is useful for determining the quality of applied contacts and the effect of surface treatments which result in a significant depletion layer. The team has made extensive measurements of the resistivity of high-resistivity silicon in order to compare the results of the new method with existing DC resistance, van der Pauw, and four-probe methods. The typical agreement between these methods and the new method is within 5 percent for slices and ingot sections greater than 1 mm in length and resistivity above 5000 ohm-cm. The method is applicable to any high-resistivity material, and measurements have also been made on semi-insulating gallium arsenide. Thurber presented a paper on the method at the Symposium on High Purity and High Resistivity Silicon held at the fall meeting of the Electrochemical Society.

Contact: David G. Seiler, 301/975-2081

STM BUILDING OF ROOM-TEMPERATURE NANOSTRUCTURES

The vision of custom-building atomic-scale structures—perhaps "nanomachines" or ultra-high-performance electronic devices—by individually manipulating atoms with a scanning tunneling microscope (STM) has inspired a number of recent experiments. The most dramatic results to date have involved positioning individual xenon atoms on a very cold (−269° C) surface. Practical applications of that technique are somewhat limited because it requires that the surface be maintained at cryogenic temperatures, and only works with a limited class of atoms. NIST researchers recently demonstrated a novel room-temperature procedure for manipulating atoms or molecules on surfaces that promises much more general application. By generating an electric field at the tip of the STM probe, they induced cesium atoms adsorbed on typical semiconductor substrates to collect under the probe tip, forming novel structures that would not otherwise occur by simple adsorption. Details are reported in the March 8 issue of Science.

Contact: Michael Baum, 301/975-2762

STANDARD REFERENCE MATERIAL CATALOG

The 1990-1991 edition of the NIST catalog for SRM materials is now available, along with its price list. This 170 page compendium offers an amazing range of different calibration standards from calibrated fertilizer to powder size standards.

The beauty of the SRM method of controlling your industrial measuring process is that it ties a control loop around your measuring hardware as well as the operators.
A2LA LIAISON REPORT

In light of the increased interest in laboratory accreditation as exemplified by the NIST model, we have prepared for the enclosed paper identifying alternative models for running a national calibration laboratory accreditation system that have not been widely discussed. *(Ed. note: See pages 36).*

Also enclosed is the November issue of A2LA News and A2LA membership information brochure. *(See stories below.)*

Currently, there are 258 accreditations with another 41 enrolled in the evaluation process leading to accreditation.

Peter S. Unger, Vice President
American Association for Laboratory Accreditation

ISO Guide 25 Criteria Revised

The final test of the ISO Guide 25 revision was agreed on October 5, 1990. It is expected to be published in final form before the end of 1990. Guide 25 contains the criteria which A2LA uses for evaluating laboratories it accredits. The Criteria Council and Board of Directors will have to decide whether A2LA will adopt this new standard for operations in the future.

Laboratories meeting these new requirements will comply with relevant requirements of ISO 9000 Series standards on quality systems *(ISO 9002 (ANSI/ASQC Q92) in particular.)* The criteria apply to both testing and calibration laboratories—permanent, temporary, and mobile facilities.


ISO/IEC Guide 38 on conditions for accreditation and Guide 49 on quality manuals are being revised. The quality manual guidance in the new Guide 25 is considerably more complete than in the last version and should be adequate without further guidance which had been in Guide 49. Both Guides 38 and 49 are expected to be included in an Addendum to Guide 25 when the revisions are approved.

International Laboratory Accreditation Conference (ILAC)

ILAC 90 met in Torino, Italy on October 8-12. Committee 1 on Commercial Applications continues to address: 1. The role of laboratory accreditation in international trade; 2. Guidelines for establishing mutual recognition agreements; and 3. Liability.


Committee 3 on Laboratory Management and Operation continues to study: 1. Quality assurance; 2. Availability and use of reference materials; 3. Calibration and maintenance of test equipment; 4. Presentation of test results and test reports; 5. Interlaboratory comparisons; 6. Methods by which laboratories insure against liabilities; 7. Technical seminars on Lab QA; 8. Use of computer acquired data; 9. Identification of testing areas; and 10. The quality manual in the testing laboratory. Recommendations for ILAC operations were presented and an ILAC log was adopted. The next general meeting, ILAC 92, will be held in Ottawa, Canada in October 1992.

Quality System Registration

A new brochure "Introducing A2QSR, American Association for Quality System Registration", was prepared and distributed beginning in early October. Its purpose was to help enroll founding members of A2QSR. Founding members are asked to contribute $5,000 to initiate the program, and commitments totaling $100,000 are the goal for the new program to begin operations on January 1, 1990. The program is intended to appeal to quality professionals, both for recognizing quality systems with which they may be affiliated and for providing an organization in which certified lead auditors can participate actively in implementation of the ISO 9000 concepts. Call for a copy of the brochure.

WESTERN EUROPEAN CALIBRATION COOPERATION REPORT

A letter has gone forward to WECC requesting copies of the most recent revisions of WECC documents quoted in Dr. Joe
Simmon's October presentation to the Board "International Standards for Calibration Laboratories." I have responded to a few requests for information on WECC.

Graham Cameron
Liaison Delegate to WECC

* * * * *

PMA LIAISON DELEGATE REPORT

President Mick Schmahl's goals for this year are to increase membership and member involvement, and to expand the scope of PMA from metrology and calibration to include "measurement" to attract a wider membership base. An ad hoc committee was established to conduct a feasibility study regarding setting up a certification program for metrologists.

Changes to the Constitution and Bylaws of the Precision Measurements Association has been presented to the membership for ratification. The changes include simplification of the language, streamlining conduct of PMA business, and making the constitution and bylaws consistent.

The second edition of the International Directory of Metrologists is expected to be ready for distribution by the end of January.

Glenn E. Rasmussen
PMA Liaison Delegate

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AMERICAN PHYSICAL SOCIETY LIAISON REPORT

The March meeting of the American Physical Society is scheduled for 18-22 March in Cincinnati, Ohio. The Hyatt Regency Hotel has been designated as the headquarters hotel with most of the technical sessions scheduled for presentation in the Cincinnati Convention Center.

The Topical Group for Instrument and Measurement Science has scheduled three (3) invited sessions. Details of the invited talks will be available within two to three weeks.

K. B. Jaeger, Liaison Delegate
American Physical Society

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ASQC LIAISON

ASQC activity in the Metrology/Calibration arena is being increased with the recommendation to the ASQC Board of Directors at the May Annual Quality Congress (May 18-23, 1991 - Milwaukee, Wisconsin) that the current Metrology Technical Committee be given Divisional Status as the Quality Measurement Division, equal in stature with other full ASQC divisions. The current technical committee officers are:

Chairman - Salvatore Scicchitani, President Gage Lab Corp., 475 Veit Road, Huntingdon Valley, PA 19006, (215) 355-5420.

Vice Chair - Arthur O. McCoubrey, NIST, Manager, 8113 Whirlwind Court, Gaithersburg, MD 20882, (301) 975-4802

Secretary - Mark R. Kurzen, QA Consultant, Eastman Kodak Co., 17 Osage Trail, Spencerport, NY 14559, (716) 477-8107

Std. Rep. - Rolf Schumacher, Sr. Metrologist, Rockwell Int., 3370 Miraloma Avenue Avenue HCO2, Anaheim, CA 92803, (714) 762-0265, FAX (714) 762-1243

Dr. Joe D. Simmons (current NIST representative to NCSL) has agreed to assume the position of Division Secretary upon the granting of Divisional status. This will further firm the connection between ASQC and NIST/NCSL. Mark Kurzen will assume the (ASQC) Region 2 (New York) divisional directorship upon the change in status.

Annual Quality Congress - Metrology Papers

Presently, the Metrology Technical committee has accepted three papers for presentation at the Annual Quality Congress in Milwaukee, May 18-23, 1991. Call ASQC Headquarters for conference information: (414) 272-8575.

Tuesday, May 21, 1991 - 9:45-11:15 AM


"Practical Applications of the ITS-90", Billy Magnum, Group Leader, and Earl Pfeiffer Gregory Strouse, Physicists, NIST, Gaithersburg, MD.

"Micronich Metrology - Dynamic Quality Advances", Mel Sater, Engineer-Scientist-Innovator, Micronich Surface Metrology, St. Paul, MN.

Currently, NCSL and ASQC are cooperating on several standards, including work on the TQM Committee, pages 42 and 46.
The M-2 standard is now being sent to ASQC for consensus-seeking. NCSL is being urged to become further involved in the standards process, especially with regard to measurement uncertainty (see NCSL Newsletters July 90 and Oct. ’90).

Barrett C. Craner, Liaison, ASQC

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CORM LIAISON REPORT

CORM 91 CALL FOR PAPERS

Spectral Irradiance Measurements and Ultraviolet Radiometry
May 21-22, 1991, National Institute of Standards and Technology, Gaithersburg, MD

The Council for Optical Radiation (CORM) solicits contributed papers on the general topic of ultraviolet radiometry for its 1991 Annual Conference (CORM 91). The conference will be held at the Green Auditorium at NIST in Gaithersburg, Maryland, and will last two full days.

Tuesday, 21 May 1991 will be a one-day tutorial session on spectral irradiance measurements. The session will be organized by William E. Schneider (Optronic Laboratories), and will include invited presentations on the types of spectral irradiance standards provided by NIST, how they are calibrated and used, and how their calibrations are transferred to secondary standards. The JCORM annual business meeting will be held at the end of the day, followed by the traditional banquet and an invited presentation by a Franc Grum lecturer. Wednesday, 22 May 1991 will feature contributed papers on ultraviolet radiometry. The UV radiometry session will be chaired by Theodore W. Cannon (SERI). CORM 91 will also include a tour of the Radiometric Physics Division of NIST.

Contributed papers on UV radiometry are invited from standards laboratories, government laboratories, academia, and industry. Emphasis should be placed on biological radiometry, earth irradiation measurements, and detoxification.

Those wishing to present a paper or needing additional information should contact:
William E. Schneider
Optronic Laboratories
4470 35th Street
Orlando, Florida 32811
Phone (407) 422-3171 Fax (407) 648-5212

Bill Simmons, CORM Liaison

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REPORT FROM ANSI

Work on finishing the draft of ANSI/ASQC M2 hit several minor snags and has been finally completed. The draft will be sent to ASQC for national consensus seeking in February 1991.

No news on the appointment of a DoD representative to coordinate the review of ANSI/ASQC M1 and M2 for possible adoption by the DoD.

Meanwhile, at my insistence at ASME and ANSI, the overdue review of ANSI/ASME TPC 19.1, Measurement Uncertainty, has begun with a meeting of the responsible ASME committee of which I am a member. I submitted a proposal for inclusion in the standard for standard metrology practices with emphasis on much needed measurement process controls, or measurement assurance. It is contained in a separate proposal to the NCSL President for possible consideration by the NCSL Board.

I have finalized the U.S. proposal for the revision of the metrology sections in ANSI/ASQC Q91 and Q94. These will be subject for inclusion in the revised ISO standards 9000 and 9004. Both transform the standards requirements from emphasis on equipment and instruments to process controls. This proposal was worked out with the help of my ASQC writing group, consisting mainly of NCSL affiliated metrologists. A preliminary review of our proposal by others working on other portions of revisions for the ISO and the ANSI standards elicited enthusiastic acceptance. Independently, emphasis of other parts of the revised standards will also be changed to process controls wherever appropriate.

Rolf B. F. Schumacher
ANSI Liaison

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CPEM LIAISON REPORT

CPEM '90 was held in Ottawa on June 11-14, 1990. The meeting was very successful in all respects; attendance of about 376 people exceeded expectations and resulted in financial solvency. The outstanding technical program included two lectures by Nobel scientists Norman Ramsey and Klaus von Klitzing; more than 100 stimulating papers were delivered before formal sessions and almost 100 poster papers were presented.

The next meeting of the CPEM will be CPEM '92 in Paris on June 9-12, 1992. The Chairman of the meeting will be Dr. Jean Blouet, Secretary General of the French National Bureau of Metrology.

(Continued on page 68)
November 29, 1990
Johns Hopkins Applied
Physics Lab
Laurel, MD
Wayne Zimmerman
Region III Coordinator

NCSL Region 3 held a semi-annual meeting on November 29, 1990 at the Johns Hopkins Applied Physics Laboratory in Laurel, Maryland. Our host for the meeting was Marlin Johnson.

Wayne Zimmerman, CMA, Region 3 Coordinator, reviewed the agenda and necessary changes. New Region 3 Coordinator, Brian Fitzpatrick, Hi-Tech, Inc., was introduced.

Marlin Johnson, APL, provided a video describing the Applied Physics Laboratory facility and its research.

Dr. Joseph Simmons, NIST, provided NCSL Board/News Updates. He spoke about laboratory accreditation, how it is to be implemented, what NCSL's role will be.

Steve Griffin, J. Fluke Manufacturing Co., spoke about Statistical Process, how specifications are determined, sigma selection versus accuracy, and how false fails and false passes can occur. He discussed techniques of data collection and analysis; linear regression and confidence bands; and software tools to perform this analysis.

Bob Gangawar, Wavetek/Datron Division, spoke about AC measurements—the history of AC measurement techniques; AC/DC bridges to solid state; performance and speed improvements and specification determination and traceability, calibration, as it relates to NIST.

Dick Steiner, NIST, led a discussion on new high performance DMM's, and Zener Reference Standards. Performance enhancements have resulted in 0.1 ppm linearity. Multi-channel Zener References exhibit excellent stability and transportability. Temperature, humidity, and EMI problems in achieving these accuracies.

Oskars Pedersons, NIST, discussed NIST's participation in standards activities and explained NIST's role of defining and maintaining the national standards for electrical and mechanical parameters. He also described NIST's role in supporting industry but not regulating industry and NIST's involvement in developing ANSI, IEEE, and IEC standards.

After lunch, Dr. Robert Chapman, NIST, discussed the Malcolm Baldrige, National Quality Award giving a history of the Malcolm Baldrige award and its purpose to reward exceptional quality performance by USA companies. He explained how the winners are determined and categories of awards. Guidelines for 1991 Application are available to any U.S. company via NIST. Current winners are Cadillac, Federal Express, and IBM.


The meeting was a successful one. Several favorable comments were made by the attendees. Thanks to all of our guest speakers and special thanks to Marlin Johnson for hosting our meeting.

ATTENDEES

Jerry Schraml  
Westinghouse  
John Schwab  
Ohmeda  
Steve Griffin  
Fluke  
Joe Simmons  
NIST  
Bob Gangawar  
Datron  
Curtis Kiser  
U.S. Navy  
David Whitten  
U.S. Navy  
Walter DeRhonde  
Lucas Weinichl  
Bill McKay  
Martin Marietta  
Jim Mauldin  
Martin Marietta  
Vernon Alt  
Litton Systems/Amecon  
George Podhorniak  
Westinghouse  
Brian Fitzpatrick  
Hi-Tech, Incorporated  
Tracy Harper  
Baltimore Gas & Electric  
DeVon Hawkiss  
Navy Primary Standards  
Tony Readling  
Duke Power  
Rich Stenner  
AAI  
Dick Steiner  
NIST  
J. G. Burns  
JHU/APL  
William Gardner  
JHU/APL  
J. W. Eckenrode  
JHU/APL
The Central Florida Section of Region 4 met on 1 November, 1990 the day after the Board of Directors’ meeting closed.

Mike Maxwell began the meeting with a welcome and opening remarks.

Gary Davidson was the first speaker on Laboratory Accreditation. Gary handed out a Proposed Strawman for a Laboratory Accreditation System operated by NIST-NAVLAP. He reviewed the proposal and opened the floor for input from the membership.

Graham Cameron gave a presentation he prepared for the NCSL Overview. At the conclusion some feedback from the membership was given to Graham to help tailor the presentation for different needs.

An Open Forum with the B.O.D. provided a good exchange of ideas and information.

After lunch Woody Tramel gave an update of the NCSL Board of Directors’ Meeting.

Don Weiss and Gene Ramba presented the TQM program at Harris Corp. A lively discussion began on several topics concerning the implementation of TQM.

Kristen Berland presented the status of the section Round Robin/MAP Committee and future goals.

Ian King gave the final presentation of the day on a 20 Amp High Frequency Transconductance Amplifier being developed.

The next meeting was scheduled for April 17, 1991.

ATTENDEES

Don Dalton
Tony Anderson
Kristen Berland
Bill Wightman
J. Graham Cameron
Bob Smith
Fred Brooks
John A. Givens
Gene Ramba
Don Weiss
Robert J. Meischied
Leonard J. Pincheck
Ian R. King
Jeffrey S. Willey
Michael A. Clayton
Jim Lewis
Steve Askew
David Hall
Ron Smith
Fred Hopkins
Dan Huber
Mike Maxwell

John Fluke Mfg. Co.
Guildline Instruments
NASA
John Fluke Mfg. Co.
Canadian Defence
Loral Aeronutronic
Delta Electronics Lab
Naval Research Lab (USRD)
Harris Corp.
Harris Corp.
CSR
CSR
Guildline Instruments Inc.
Guildline Instruments Inc.
Sawtek Inc.
EG&G, Florida
Honeywell, Inc.
Honeywell, Inc.
Grumman
Metrum Instrument SUC
EG&G
The BioNetics Corporation

The fall meeting of the Region 6 West section was held at Ball Aerospace Corporation. Of the sixteen attendees, fourteen represented NCSL member companies, three were manufacturers, and one was support/educational staff.

Bill Bruce (Hewlett Packard, Loveland, 303-679-2438) discussed ISO-9000 and reviewed the National Conference.

Tom Annes (local PMA president, 303-333-3167) relayed information on local PMA activities and structure. Meetings are held the fourth Tuesday of every month. Contact Tom for information.
Regional Reports

There is a growing need for outside calibration services for primary standards, since NIST prices are becoming prohibitive for some users and turn-around time is slow.

The categories in the NCSL directory should be reviewed with more descriptive categories used. The current categories are too broad in some cases.

After the meeting was adjourned, Paul Trimbach (Ball Aerospace, 303-939-5080) conducted a tour of the Space Simulation facilities and Metrology areas.

Deirdre Lavallee thanked Ball Aerospace for providing the host facilities. Our hosts also provided the grand door prize, a Dremel Motor Tool Kit, won by Greg Burnett of Hewlett Packard.

Appreciation is also extended to our topic discussion leaders and guest presenters, as well as to Neil Peacock (HPS Division of MKS Instruments, Inc.), our photographer.

Meeting Discussion Topics:
Fasteners - Current Issues - Roger Casto (Dimensional Metrology Services, 303-278-1464) presented an overview of the counterfeit bolts issues. He discussed the origin of the bolts, measures being taken at industrial and Congressional levels, and steps that should be taken to prevent loss due to these bolts. There are standards available, and Roger has additional reference materials available for those interested.

1990 Volt, OHM and Temperature Changes - Bill Bruce (Hewlett Packard, Loveland, 303-679-2438) led the discussion on updates available and group input on what steps their organizations have taken.

Update on 45662A - Greg Burnett (Hewlett Packard, 303-649-5460) led a lively discussion on 4566A reviews. He outlined the requirements in the MIL HDBK52B, and covered the issues dealt with in meeting the requirements. The discussion concluded with a review of sample forms used at Hewlett Packard in Englewood, and feedback from attendees of their experiences. Copies of Greg’s informative overheads may be obtained from him in Englewood, Colorado.

Tentative Topics for March Meeting (3/13/91):
“Computers as a Metrology Tool” by Phil Quigley of Ball Aerospace.
“Hewlett Packard’s 3458 DVM” by Bill Bruce of Hewlett Packard.

The next meeting will be held on Wednesday, March 13, 1991. Location will be announced at a later date.

ATTENDEES
Walt Seidl
Roger Casto
Paul Trimbach
Al Coyle
Deirdre Lavallee
Bill Bruce
Carl Gola
Gary Carr
Tom Annes
Patrick Fedorowicz
Dan Stansbury
Herb Vinson
John Portman
Allan Waaver
Richard G. Robinson
Greg Burnett

CEESI
Dimensional Metrology Serv.
Ball Aerospace
Ball Aerospace
MKS Instruments
Hewlett Packard
Storage Technology
Storage Technology
Precision Measurement Assoc.
Raytheon Support Services
Raytheon Support Services
ValleYlab
Rocket Components
Hewlett Packard
Hewlett Packard
Hewlett Packard

Ball Aerospace hosted the September 12, 1990 West Section meeting in Boulder, Colorado.

Four星星

The meeting was held 25 October 1990 at NASA/AMES, Moffett Field California. The meeting was co-hosted by Mike Zahl, Simco/AMES, and Ashley Harkness, Electro-Test. Fifty-eight delegates and guests attended.

The meeting started at 8:45 AM with Bard welcoming everyone and introducing Mike and Ashley for do’s/don’ts, etc. while at NASA/AMES.

Bard awarded service pins to the following delegates: John Lee, 20 years; Charles Perston, 15 years; Bill Wexted and Gary Ross, 10 years; and Jerry Papenfuss, 5 years.
The first presenter, Don Cox, GIDEP, presented "how to" join GIDEP; demonstrated the computer on-line hook up with GIDEP and how to seek information. After this presentation, the group broke for the U-2 take-off.

Next, Lynn McCulloch, National Instruments, presented the "Automated Testing: Using Your Personal Computer." She demonstrated the Apple Computer with various HP test equipment and the N.I. special boards and software to represent a test of the HP 3335A. Lynn answered field questions from the floor and showed various methods of testing.

Next speaker was Gary Davidson, TRW, who presented a discussion on methods of TQM in the laboratory. Gary's presentation consisted of handouts and a poll on how to proceed in his TQM goals.

After breaking for lunch, we returned to Gary's presentation. The thrust of his put-out was a policy of audit that all groups would buy, i.e., one audit of a firm that all agencies would agree to. There was much dialog on this subject. He also gave a briefing on EC progress.

Next Mr. Robert Hamburg of DCASMA Defense Logistics Agency presented an auditor's view of MIL-STD-45662A. This topic provoked a lively discussion. Some of the points he made were: audits will be a more administrative function; his auditors will attend class on how to audit; and all contracts after 1988 are covered by this standard. He pointed out that proper documentation must be addressed. He covered various paragraphs and fielded questions from the floor.

The meeting adjourned at 1535 for a tour of NASA facilities.

Bard announced that next year's meeting schedule will be 6 February to be hosted by GTE Systems, 7 June 1991, HP, Palo Alto, and 31 October 1991, HP, Mountain View.

ATTENDEES

Diane Bell
Bob DeLapp
Dale Crites
Tom Barry
Mike Zath
James Coker
Carolyn Hiller
Rich Burns
Charles Balkon
Gary Davidson
Doug Johnsen
John Miché
Bard Dunkelberger
Gary Ross

Lockheed
SRI International
J. Fluke
Lucas Zeta
NASA/SCMCC
teledy/NESL
PG&E
Hewlett Packard
IBM
TRW
FMC
Chiron
ESL
Kaiser Electronics

Ken Landis
Phil Hann
Robert Bahra
Ashley Harkness
Bruno Benaski
C.D. Perston
Don Cox
Paul Nadeau
Jerry Papenfuss
William Harrison
Larry Nelson
Durward Ayre
D. L. Mahony
Ivan Therrien
Jim Ingram
David Cross
John Lee
Linda Ferguson
John Philipp
Bob Heyer
Joe Corege
Lynn McCulloch
Ann Garrison
Alex Schonfeld
Guy Fleming
Fred Sicc
Robert Hamburg
Edwin Sabathia
Robert Harano
Ron Schlichtemerer
Bill Wexted
Thomas J. Miller
Wilfred Lee
Bill Adrian
Debbie Cabusas
Rusty Jarzombey
John Toftemark
Bill Maurer

ElectroRent
LLNL
Teledyne
RIT
Hewlett Packard
Dalmo Victor
GIDEP
Precision Lab
General Electric
Litton ATD
GIDEP
Ford
Apple
Apple
Inwil Metrology
Watkins-Johnson
Telysis
Intel
GTE
Telysis
Hewlett Packard
National Instrument
ESC
O'Scopes, Etc.
LMJC
Raychem
DCMAO Van Nuys
IBM
IBM
Ford
GTE Systems
Electro Rent
United Technologies
United Technologies
Watkins Johnson
Avantek
Tektronix
Apple

REGION 8

September 19, 1990
Revere House
Santa Ana, CA
Rolf Schumacher
Region 8 Coordinator

Rolf Schumacher called the meeting to order.

After the introduction of officers and members, Mr. Schumacher started his presentation on the future of American National Standards for Calibration Systems. The first part of this presentation started with an historical overview of ANSI and ISO, which led into a description of
the present organizational layout of both organizations to include the various committees that effect calibration.

Mr. Schumacher then took us on a trip through the new ISO 9000 series documents explaining their significance to the calibration community and quality operations in general. He pointed out that the ISO series is a set of quality system standards similar to the DoD document MIL-Q-9858A. A related ISO standard, now designated ISO 10012, Quality Assurance requirements for measuring equipment—Part 1: Metrological confirmation system for measuring equipment, the equivalent of MIL-STD-45662A, has just been completed and will be published soon, against the disapproving votes of the USA, France, and some other countries. They do not provide adequately for measurement assurance methods. However, Mr. Schumacher was requested to draft ISO 10012 Part 2, Measurement Assurance; with changes in Part 1 to make both parts compatible, these standards should then become acceptable to the USA.

ISO standards are written by private organizations and are voluntary, although in most countries other than the USA, governments play often important roles in the activities of these organizations. By being accepted and understood worldwide, they are expected to be generally used as contractual documents between customers and suppliers and thus become quasi-mandatory—at least for anyone trying to stay in business. Furthermore, the European community (EC) has set legal requirements for consumer and environmental protections leaving little or no choice in the compliance with some of these standards for anyone doing business in Europe.

First issued in 1987, the ISO 9000-series standards must be reviewed by 1992. The USA is attempting to update the standards to include such concepts as continuous quality improvements, total quality management, and others not yet contained in the first version. The ISO 9000-series standards are published in the USA by the ASQC as ANSI/ ASQC Q80-series standards.

Mr. Schumacher is organizing a DoD/ASQC review group to attempt to make ANSI/ASQC Standards M1 and M2 acceptable to the DoD so that they can take the place of MIL-STD-45662A. Agreement on the consensus ANSI standards is the first step to bring USA viewpoints into international standards.

After lunch, Region 8 Director Dr. Howard Castrup, Integrated Sciences, presented a 10-year Service Award pin to NCSL Vice President Bob Smith, Loral Aeronutronic. Dr. Castrup then proceeded to report from the Board of Directors. Some of the items mentioned were: dues increase, update of the Interval RP, round robin of gage blocks, and an RP on Intrinsic Standards and T+M World is going to run an NCSL page.

The final item on the agenda was a discussion on Laboratory Accreditation Issues for EC92 which was supposed to be led by Delbert Caldwell who was not able to attend. Mr. Rolf Schumacher jumped in and started the discussion by explaining the accreditation program as established in the EC92. This opened up vocal interchange on who, when, and how these accreditations are to be performed. It was pointed out that at this time NCSL does not have a policy statement on this subject, but it is being worked on in conjunction with NIST.

ATTENDEES

Ed Bartell
Steve Balkesly
Hank Cauette
J.O. Cristman
Stanley Crandon
Torban Ehler
Ehman Arno
Curt Farren
Raymond Feshour
Gerald Heldt
William Hatton
Dale Laube
Wayne P. Laube
K. J. Lund
Bill Moore
Paul Nelson
D.V. Pinnecker
Louise Reimber
G. D. Royster
Rolf Schumacher
Bob Smith
Jim Tavernier
Tibor T. Torma
Howard Castrup

NRC VSE & Assoc.
Interstate Electronics
ICC Instrument
Rohr Industries
Consultant
Bruel & Kjaer Inst.
Beckman Instruments
Beckman Instruments
Raytheon Co.
IMS
ICC Instrument
ICC Instrument
Rockwell International
LA County Weights & Meas.
Hughes Aircraft Co.
Rockwell International
ICC Instrument
Hewlett Packard
Rockwell International
Ford Aerospace
Aerojet
Varco Drilling Systems
Integrated Sciences

Revere House was the setting for the Region 8
LA/Orange County meeting in Santa Ana.
A brief meeting was held on November 28th to plan upcoming events for the Kansas City area of the St. Louis Section. The goals we hoped to achieve at the meeting were:

- Determine whether there is enough interest in the Kansas City area to hold two meetings per year here (in addition to two/year in the St. Louis area).
- Develop a plan to “get the word out” to potential members to ensure good attendance at our meetings and increase section membership.
- Set regular dates for the semi-annual meetings.
- Find hosts for our meetings.
- Determine the first meeting’s topics and speakers.
- Define guidelines for the meetings.

The meeting went very well and all goals were achieved as detailed below.

The consensus was that with a good “recruiting” effort on the part of the attendees, and other section members, there are enough companies in the Kansas City area with concerns in the measurement sciences to hold two meetings per year. Some cautioned that tight travel budgets might prevent folks from getting out to attend our meetings. Most of us feel, though, that interested people would be able to attend local meetings where they might not have the travel budget to attend a St. Louis meeting.

The meeting attendees agreed to distribute literature, and to show to their contacts and customers the advantages of attending our meetings and/or becoming members of NCSL. I will see that everyone is supplied with whatever NCSL literature is desired. I will also keep a mailing list of members and potential members and update folks on the list with meeting notices and minutes.

Meetings are scheduled for Thursday of the second full week (that begins with Sunday) of the months of April and October (i.e., April 18 and October 17 in 1991).

The local offices of five companies volunteered to share host duties. They are John Fluke Mfg. Co., Inc., Hewlett Packard, Tektronix, and a fourth team made up of the local Midtec and Dytec reps. Ann Ekis and Mark Sandersfeld of the local HP office have offered to host the first meeting.

Tentative topics of discussion for the April 18th, 1991 meeting are:

- Metrology terms and definitions. Bob Willett will lead a discussion on the many different definitions of common terms that are found in various Quality Assurance/Metrology documents.
- The new International Temperature Scale - ITS-90.
- Threaded Fasteners. What are the possible effects on us of recent litigation and legislation.
- The proper “care and feeding” of microwave connectors.
- Open floor for discussion of new products, developments, current events and/or any other topics of interest.

The meetings will normally run from 9 to 4. They’ll include hosted breaks in the morning and afternoon, and perhaps, a catered light lunch. Each should begin with introductions and NCSL business. Each meeting’s agenda will include four or five topics of technical or managerial interest (preferably a mix). Discussion and/or presentation of the topics...
will normally run 45 minutes each, including an introduction followed by “round-table” open discussion. A brief “show and tell” session will be included in each meeting to give vendors a chance to mention new products or services.

ATTENDEES

Chris Toynbee
Keith Frank
Matt Pansing
Doug MacClymont
Bob Willett
Mel Quinn
Bob Schultz
Dick Schneider
Terre Wilson
Sam Matier
Ann Eikes
Dave White
Mark Sandersfield
Kelley McDaniel
John Fluke Mfg. Co., Inc.
Tektronix
MIDTEC Associates, Inc.
Dytec South, Inc.
JcAir
Palestine Eng. Sales, Inc.
Tektronix
AT&T
Gates Energy Products, Inc.
TecRep Corporation
Hewlett Packard
Walters Industrial Elec., Inc.
Hewlett Packard
Bendix/King GAAD

* * * * *

January 16, 1991
Kelly AFB PMEL Center
San Antonio, TX
Ronne Eubanks
Region 6 Coordinator

Ronne Eubanks, the Region 6 Coordinator, gave a review of NCSL business and answered questions about various topics. It was requested that the NCSL generate a survey for suggestions for the name change of NCSL.

Keith Scoggin of HL&P South Texas project will be attending a conference in California and plans to discuss audits and the acceptance of audits by other agencies in hopes of a reduction in the quantity of audits. Keith will report back on the results of these discussions at our next meeting. At the day’s end, door prizes were awarded. The prizes included NCSL briefcases, NCSL cups and playing cards, and an NCSL cap.

Ronne Eubanks
Region 6 Coordinator

ATTENDEES

Jim Greenwood
Frank Toich
Cliff Bettinger
Dan Garza
James R. Denton
Sophie Borja
Ed Gurton
Walter Smithson
Jim Meeks
Robert Trollinger
Mike Riggs
James McCune
Dan Wilkerson
Peter Stegemann
Jim Patterson
Don Francis
Keith Scoggin
Elliot Moser
Johnnie L. Winters
Dave Sanders
Butch Guerrero
Gilbert Uribe
Ronne Eubanks
Mark Thornton
Gerald Dalum
Robert E. Fritz
Ted B. Solis
John Turner
Airep Electronics
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The South Section meeting was opened by remarks from Mark Thornton, section leader, and followed by greetings and information concerning facilities and the agenda. He introduced Gilbert Uribe, the PMEL Branch Chief who was our host at Kelly AFB. Ms. Sophie Borja and Jim Denton, the Defense Contractor Management Command (formerly DECAS) gave a brief talk and answered questions. After Ms. Borja’s talk, there was discussion about audits, methods of audits and what was required of these audits. One of the main messages that was emphasized by Ms. Borja was to do what you say you are doing in your specifications or contracts.

Mr. Frank Toich from KEPCO, Inc. gave a presentation on Total Quality Management (TQM). The things emphasized in this presentation were to build quality in and not inspect for defects; quality improvement must start at the top of the company, and you must have continuous improvement.

Mr. Jeff Mihaleksi, the Kelly AFB Radiation Safety Officer, gave a presentation on radiation safety, dosimetry equipment, permits and instruments. He displayed and explained different types of instruments and their uses.
Instead of an "out by the pool" shot, this group stayed in the lab. Maybe they don't have pools in San Antonio?

The Lab Tours are always a popular agenda item, because we get to see how the pros do it.

A PMEL force calibration station.

CANADIAN WORKSHOP
(Continued from page 34)

One last point—the documentation need not be elaborate, but it must be established and maintained to be consistent with implemented practice. It should be organized to readily show that the adopted criteria are practically desired and fully implemented to achieve required consistency. Matrices relating the criteria to the available documentation are quickly established and are an excellent way to maintain and present "your" system.

With such attitudes and system in place, audits can be welcomed and profitability enhanced!

LIAISON NEWS (continued from page 60)

CPEM'92
PRELIMINARY ANNOUNCEMENT
9-12 June 1992
Paris, France

Art McCoubrey, CPEM Liaison Delegate

SOMEONE YOU SHOULD KNOW
(Continued from page 25)

recommend suitable actions, and will command the resources necessary to assure the ouster and replacement of those representatives who stray too far from these recommendations. Can any reader of the Newsletter devise such an organization—one with the power and also with the ability to decide what actions are "suitable?"

Harvey W. Lance
January 17, 1991

Editor's Note
During this 30th anniversary year, I will try to run a few stories on retired members who were influential in the early and middle years of NCSL. One of these people was Harvey Lance, long retired from NBS, and now living in Arizona. Harvey furnished these words, and they needed no other editing on my part to give you a nice picture of a dedicated man. We hope that Harvey will make it over to Albuquerque to the annual conference. JM
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- 74 -
Application for Membership in NCSL

NCSL is a nonprofit association of laboratories or organizations that maintain or have an interest related to measurement standards and calibration facilities. Each member organization appoints a "member delegate" who has the responsibility of representing the member company or organization in NCSL. Member delegates, working within authority limits agreed upon with their appointing officers, coordinate members' involvement in NCSL's diverse activities.

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

hereby applies for membership in the National Conference of Standards Laboratories and appoints as its member delegate,

Delegate's Name

Title

Department or Division

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who will serve until further notice.

Appointing Officer:

Official of Member-Applicant Organization who appoints the above member delegate

Title

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Signature of Appointing Officer Date

ANNUAL DUES (January–December)...$175 (includes subscription to NCSL Newsletter)
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Please remit amount shown with Application in U.S. funds. Make Checks payable to: National Conference of Standards Laboratories.

"SERVING THE WORLD OF MEASUREMENT"
meeting attendees covering their pattern of participation in NCSL events, their attitudes, preferences, and recommendations on several key issues. I ask for your careful consideration and valued input.

FORMATION OF AD-HOC COMMITTEE ON MEASUREMENT UNCERTAINTIES

Rolf Schumacher proposed to the Board that NCSL form a committee on measurement uncertainties. He proposed that “the committee should be instrumental in the formulation of consensus positions on measurement uncertainties meeting the needs of calibration and standards laboratories and associated industry concerns. It should provide the core of, and cooperate closely with, a larger group of parties concerned with measurement uncertainties as comprise also testing facilities, quality control, and possibly others.”

Dave Abell, Director of Metrology, Hewlett-Packard Company, Mountain View, California has been appointed to chair this important committee. Dave is in the beginning stages of organizing this committee and would appreciate your ideas and suggestions (Dave Abell, (415) 691-5878).

TQM COMMITTEE ON CALIBRATION SYSTEM REQUIREMENTS - ANOTHER MAJOR STEP FORWARD

Thirty persons attended this committee’s meeting, hosted by NIST Gaithersburg February 19th and 20th, and progress was made. Representatives from industry, NASA, NIST, Food and Drug Administration, Defense Logistics Agency, Federal Aviation Administration, U.S. Army, Navy, and Air Force, Department of Energy Nuclear Regulatory Commission, and the American Association for Laboratory Accreditation examined the feasibility of developing a single standard which would be recognized by all agencies. See Bob Smith’s summary report on page 46 for the committee’s plan of action.

UPCOMING EVENTS

Spring Board Meeting Site

It is my pleasure to welcome the Board of Directors to Vancouver, British Columbia, April 8th-12th. (Vancouver is rated as one of the top ten executive meeting locations in North America). Let me advise those readers relatively new to NCSL that this will be the sixth board meeting in Canada. We’ve held meetings in Victoria, British Columbia; Toronto, Ontario; Quebec City, Province of Quebec and two in the National Capital Region (Ottawa, Ontario/Hull, Quebec).

NCSL Executive - NIST Management Meeting

The annual NCSL-NIST meeting takes place at the NIST Gaithersburg facility May 13th and 14th. Bill Simmons, Bob Smith, and I invite any comments or inputs appropriate to this event.

1991 WORKSHOP AND SYMPOSIUM - AUGUST 19-22 ALBUQUERQUE, NEW MEXICO

Excellent Setting - Excellent Program

The Albuquerque convention facility provides an ideal opportunity to see the most recent metrological products, attend a series of rewarding technical presentations and discuss measurement matters with your colleagues and a well-qualified range of experts. A southwestern style lounge in the middle of the exhibit hall adjoins the exhibits and rooms for presentations.

Avery good guest program has been developed to capitalize on the many attractions in this unique state.

Interest-catching papers include: New Calibration Activities at NIST, Design of the New Sandia Calibration Laboratory, Pacific Rim Metrology Standards, Designing Environmental Control Systems for Laboratories, India’s Laboratory Accreditation Scheme, Procedures for Assuring Traceability by the Western European Calibration Coordination and special sessions devoted to equipment management issues.

Don’t miss the last day of this event featuring a major session devoted to “A Single U.S. National Standard for Calibration Systems and Calibration Laboratory Accreditation.”

You have the choice of three hotels all within a 5-minute walking distance of the Conference Center. The convention hotel is the brand new Hyatt Regency just across the street from the center. The average high temperature in August is 88°F (31°C) with an average low of 62°F (16°C) and low humidity values.

I look forward to meeting you in Albuquerque!

Graham Cameron, President
ISO International Report
(Continued from page 30)

ISO Standard on Measurement Assurance

At the conclusion of the working group meetings, Peter Clifford asked me to draft a proposed Part 2 to ISO 10012 for “Measurement Assurance.” I gladly accepted this opportunity for us to help shape international standards in a very significant way.

With the eventual completion of this Part 2, Part 1 will have to be revised to make the two standards compatible. I expect that then all the proverbial pieces will fall into place, and we shall end up with an ISO 10012 that will not only be acceptable to the US but will also introduce much of the world to the latest concept of measurements to be controlled much like other processes.

Peter Clifford was following with his request the thoughts first voiced by the working group participants at my first presentation of the measurement assurance concept in London in 1988. And in view of our strong objections to ISO 10012.1, he set the pace for a rapid resolution of our main concerns. The first draft will be discussed at a meeting of WG 1 in London in June 1991.

This assignment adds increased urgency to the project, led by Karl Speitel, of writing a guidance document on measurement assurance. Karl will continue his work with the guidance document. I, therefore, shall draft the requirements document as a composite of our M1 and M2 and route it to our Task Group for comments, change proposals, and to reach as much consensus as possible before circulation to the rest of the world. As M1 and M2 have already found widespread agreement, the resulting composite could be expected to be acceptable within the US. Working drafts will continue to be widely circulated to obtain consensus.

With the writing of an ISO standard on measurement assurance, we will be achieving a goal set by Dr. Arthur McCoubrey of the National Institute of Standards and Technology whose efforts are largely responsible for me to be part of the US delegation to ISO/TC 176. We are deeply indebted to Art for his untiring efforts in behalf of measurement assurance. As Art is nearing retirement, I hope we shall be up to the task of setting him a worthy monument.

To the members of Task Group 1 and all those who have helped shape our position, my many thanks for their valuable support and my plea for future cooperation. I am confident that our efforts will greatly contribute to the development of the best international standards in our field for which we can find wide acceptance.

Rolf B. F. Schumacher, 18 February 1991

1991 NCSL Workshop & Symposium

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Speakers/Entertainment: Dave Abell
Local Arrangements: David Braudaway
Door Prizes: Mike Suraci

-78-
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All RP's 1-9 inclusive 80.00

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<table>
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<th>Issue Date</th>
<th>In Mail</th>
<th>To Printer</th>
<th>Last Editorial to Editor</th>
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<td>July 91</td>
<td>1 Jul. 91</td>
<td>15 Jun. 91</td>
<td>1 June 91</td>
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<td>1 Oct. 91</td>
<td>15 Sept. 91</td>
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<tr>
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<td>15 Dec. 91</td>
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<td>Apr. 92</td>
<td>1 Apr. 92</td>
<td>15 Mar. 92</td>
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EDITOR'S NOTE

This schedule is for guidance for anyone who needs to submit material for publication in the Newsletter. You can understand that in a purely voluntary function like this, the Newsletter must be secondary to my regular job. I try to stay on schedule, but there is zero backup, so if I must travel on company business or other, nothing gets done.

BOARD OF DIRECTOR'S MEETING DATES

Apr. 8-10, 1991
New World Harbourside
Vancouver, BC, Canada

Aug. 18-23, 1991
In conjunction with the 1991 NCSL Conference
Hyatt Regency Albuquerque
Albuquerque, NM

Oct. 21-23, 1991
Sheraton Music City
Nashville, Tenn.

(Following are Tentative Locations and Dates)

Feb 3-5, 1992
(Following MSC 1992)
San Diego, CA

May 4-6, 1992
San Antonio, TX

Aug. 2-7, 1992
(In conjunction with the 1992 NCSL Conference)
Washington, DC

October 26-28, 1992
Philadelphia, PA

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