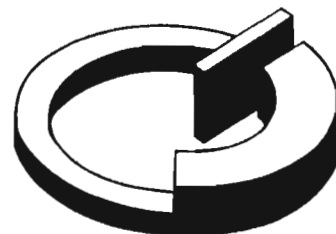


THE AUSTRALIAN METROLOGIST



Published by the Metrology Society of Australia. ISSN 1321-6082

FROM THE PRESIDENT

What is a metrologist? This may seem a strange question for the president of the Metrology Society of Australia to ask. There are, after all, now almost 300 members who are considered to be metrologists by both themselves and the MSA. I suggest, however, that we don't currently have a clear, unambiguous definition of a metrologist, and this has important practical implications. It is, after all, fundamentally a question of who we let into the MSA!

As chairman of the Membership Qualifications Committee, I can tell you that our working definition of a metrologist has been developed in response to who has applied for membership. We have not accepted everybody but we have also continually widened the boundaries. The MSA now includes people from many scientific and engineering disciplines and from very diverse backgrounds. This has occurred in the context of a membership with a strong desire that metrology be further developed as a profession, with membership in the MSA signifying formal recognition of the qualifications and expertise for one engaged in the practice of metrology.

It is time then to consider more deeply the definitions of a metrologist. Metrology is the science of measurement. It follows that a metrologist is one skilled in the science of measurement. But measurement is fundamental to all science and engineering, and every experimental scientist, engineer and technician could rightly claim to be skilled in measurement. Does this mean that they are all eligible for membership in the MSA? If an astronomer or a civil engineer or a laboratory technician from a university applied for membership, should we accept them?

I suggest that the phrase "*skilled in the science of measurement*" means more than simply being skilled in measurement. A metrologist is someone primarily concerned with the *science* of measurement, not necessarily the uses to which the measurements may be put. An astronomer whose primary work is to search the skies using existing measuring equipment, relying on the work of others to ensure the validity of his measurements, is not a metrologist.

Conversely, an astronomer who is primarily responsible for ensuring the validity of astronomical measurements, or developing new astronomical instruments, or analysing the uncertainties of astronomical measurement techniques or developing new astronomical length standards, is working as a metrologist. Thus, if this astronomer has had more than five years experience in this type of work and is suitably qualified, then I suggest he or she should be admitted as a member of the MSA.

This implies that the potential membership of the MSA is very wide indeed. This is significant and should be promoted to the wider scientific and industrial community, not primarily to increase our membership, but because the MSA can provide a much needed unifying force, bringing consistency to the various disciplines in relation to the principles, techniques and terminology of measurement.

All this implies that there is a *science* of measurement. If so, what are the fundamental assumptions and principles on which the science of metrology is based? Are they documented somewhere? Are they in a textbook? What do you think are the basic principles? **I challenge all members to come up with a set of basic principles of metrology and send them to me or to John Mitchell, the Editor of TAM.** The best and most concise will be published in the next edition of TAM.

To start you off, here are two suggestions:

All measurements have an associated uncertainty of measurement.

Measurement uncertainties of repeat measurements made on the same measure and under identical conditions using the same measuring apparatus must overlap.

I am sure that you will be able to come up with more than these, based on the principles you apply to your work everyday. If we collect only one from every member, we will have a very large set which we can use to begin to write a collective wisdom. I look forward to discussing this and other matters metrological over a beer at the inaugural MSA conference in Sydney in November. See you there!

John Miles

THE AUSTRALIAN METROLOGIST

The Australian Metrologist is published four times per year by the Metrology Society of Australia Inc., an Association representing the interests of metrologists of all disciplines throughout Australia. Membership is available to all appropriately qualified and experienced individuals. Associate membership is also available.

Membership Enquiries

Contact either your State Coordinators (see inside back page for contact details) or the Secretary, Mr Colin Wagg on (03) 9329 1633 or fax (03) 9326 5148, or write c/o:

71-73 Flemington Road
North Melbourne VIC 3051

Membership Fees

Members	\$30 Joining Fee
	\$30 Annual Subscription
Associates	\$25 Joining Fee
	\$25 Annual Subscription

Contributions

Articles, news, papers and letters, either on disk or hard copy, should be sent to:

The Editor
The Australian Metrologist
c/o 71-73 Flemington Road
North Melbourne VIC 3051
Fax (03) 326 5148
Phone (03) 329 1633

The deadline for the next issue is 4 December

Sponsorship

Would you or your company be interested in sponsoring a future issue of *The Australian Metrologist*? If you are a Member or your company is in the metrology business, a contribution of \$350 goes a long way towards covering the printing costs and permits the sponsor to include a relevant insert (up to A4 in size) in the mail-out. Write or fax the Editor if you are interested.

Positions Wanted/Vacant

Need a Position?

Write to or fax the editor with your details including years of experience and qualifications. This service is offered free of charge.

Need a Metrologist?

If you have a position vacant, write to or fax the editor with the details. A charge of \$20 for up to 10 lines applies. The circulation may be small but it is well targeted!

The deadline for positions wanted/vacant is five days before publication.

Letters to the Editor

Letters should be limited to 200 words. Authors will be contacted should editorial changes be considered necessary.

Editorial Policy

The editor welcomes all material relevant to the practice of Metrology. Non-original material submitted must identify the source and contact details of the author and publisher. The editor reserves the right to refuse material which may compromise the Metrology Society of Australia. Contributors may be contacted regarding verification of material.

Opinions expressed in *The Australian Metrologist* do not necessarily represent those of the Metrology Society of Australia. Material in this journal may be reproduced with prior approval of the editor.

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THE AUSTRALIAN METROLOGIST

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MSA DIARY

November

- 29 Annual General Meeting - NML Sydney
- State Co-ordinators Meeting - NML Sydney
- 30 Employment survey responses due

November/December

- 29-1 The Metrology Society of Australia Conference, NML, Sydney.

December

- 4 Deadline for *The Australian Metrologist*
- 12 Planning day for 1996

March

- 13 Social evening - *Beauty and the Beast*

Management Committee Meetings and Planning Days

Members wishing to contribute agenda items or attend any of the Management Committee Meetings shown in the diary should contact the President, John Miles on (03) 542 2964 or by fax (03) 544 1128.

MEMBERSHIP DRIVE

The Metrology Society is conducting a membership drive. At three hundred members in the space of two and a bit years, we have done well. But for the Society to achieve all of the aims and objectives we set ourselves, we need to have more members in all categories.

A stronger MSA numerically will mean we are stronger both financially and as an influence in Australian industry, government and science in terms of the importance of metrology to "value adding". A larger membership will also enable us to embark on more education programs, seminars and training exercises.

It is particularly important that the memberships in the less populous States and Territories be increased to ensure the viability of each of their chapters.

If you would like some of the MSA brochures to hand out to colleagues and business contacts, please do not hesitate in asking your State Co-ordinator or the Secretary.

LABORATORY COMPUTING

The trouble with spreadsheets

Data Corruption in Spreadsheets is Alive and Well!

With the recent reports of the new Intel processor making occasional calculation errors, I find myself looking out for simple arithmetic errors these days. Recently I found myself moving data around from one spreadsheet to another only to find the numbers in the new spreadsheet were different to the numbers in the old spreadsheet.

My immediate concern was directed at processor errors. My next concern was how to successfully move my data to allow a simple days work to be done.

Fortunately I am surrounded by computer literate people who not only use computers, but write programs, solve problems and generally come up with the ideas that I write about. In no time at all I had three solutions to the problem and a good reason why it had happened.

My task was to move data from Lotus 3.1 to Excel 4. This particular version of Lotus was written as a DOS application and, essentially, was written using 8 bit arithmetic. To perform useful calculations, numbers are, however, composed from four 8 bit numbers. These tend to be stored in scientific format with two parts, the mantissa and exponent. The mantissa occupies the first three or so bytes and the exponent the remaining bits.

In more recent applications, and those written to be used with Windows, you may find either two 16 bit bytes or 32 bit arithmetic being used directly. To allow the most precision to be gained from handling numbers in this binary format, numbers are usually multiplied by a scaling factor then stored for later use.

All of this happens behind the scenes in spreadsheets and calculators without even a hint of the hard work going on. Herein enters my problem: moving data from an 8 bit application written by one software vendor to a 32 bit application written by a different software vendor. If application writers use different scaling factors, or if they compose their numbers differently, the numbers may not translate effectively.

The errors can be small and look like rounding errors in the ninth or tenth place or they can be quite large as in my case where 0.05 was added to numbers of the order of 100. The problem is more likely to happen when you change software vendors rather than when simply moving to a software upgrade. The scaling

factors are more likely to be the source of change.

It is, however, a case of *user beware*. If you do change or upgrade your spreadsheet you really need to do some form of audit on the results.

If you find it necessary to do this type of data movement, a simple strategy to get numbers translated without damage in the move is to **treat the data as text during the move**. This can be accomplished by saving the spreadsheet as a text file then reading it with the new spreadsheet. The numbers come in as text but appear and can be used as real numbers.

My example with Lotus and Excel should not be taken as any criticism of either application. This problem can occur with any two spreadsheets, so users should be alert to data corruption regardless of how data is handled or moved and whoever has written the software

Neville Owen

MEMBERSHIP SURVEY

This issue of *The Australian Metrologist*, we are focussing on membership of the MSA. As part of this focus, we are conducting the first membership survey.

The primary aim is to build a better database of information, both for the benefit of the Society itself and for our members. This information will, we hope, be useful to people considering a change of employment, seeking to employ a metrologist or just to satisfy curiosity.

Another aim, however, is to find out how members found their way into measurement. To the question "what do you want to be when you grow up?", we assume that few children blurt out "a metrologist".

We want every Associate and Member to complete the questionnaire which can be found with this issue and return it to the editor before the end of November 1995. A preliminary summary will then be presented in the December issue of *The Australian Metrologist*. A full report will be published in the new year, either in TAM or as a stand alone document which will be available to members.

The survey is anonymous and no effort will be made to correlate information given with that supplied in the application.

Please take the time to complete the questionnaire. With not quite three hundred members, it is important to get everyone's response to give the data better statistical reliability.

NML NEWS

New NML Tests and Measurements booklet

A new edition of the NML Tests and measurement booklet has been published for 1995/96. This publication is invaluable for laboratories requiring the services of NML as it lists all of the calibrations and measurements routinely performed. A fee schedule is also provided in loose leaf format so that it can be updated if required.

The new version is a little more user friendly than the previous edition and has all of the appropriate staff pictured (although one or two staff don't look particularly user friendly).

To obtain a copy, contact NML on (02) 413 7211.

Regional Standards of Length

Everyone relies on the metre being the same in Australia as it is in Asia, Europe and North America. Without this level of confidence, we would not be able to manufacture components such as automotive parts in different countries and be sure they will fit and function in the final assembly.

However, this global uniformity in measurement doesn't happen by accident. The **Bureau International des Poids et Mesures** (BIPM) arranges intercomparisons of the length standards of countries around the world to ensure that differences in standards are minimised.

The metre is defined in terms of the distance travelled by light in $1/c$ seconds where c is the speed of light. The practical way to produce a standard of length which embodies this definition is by using a special type of laser - an iodine-stabilised helium neon laser.

Until recently, countries which wanted to confirm the international acceptability of their laser length standards had to calibrate a secondary standard (such as a gauge block) against their standard, and compare their results with the results obtained by other nations. This process is useful in checking uniformity of results, but it only gives confidence to the level of accuracy achieved by secondary standards. For the best level of confidence, it would be desirable to directly compare the primary laser lengths.

The BIPM has prepared a travelling laser length standard which can be taken to various countries to provide direct comparisons. With the number of countries now owning laser length standards, a country-by-country comparison would take an unacceptable amount of time. So the BIPM has

selected laboratories within various geographical regions and used these centres to bring together numbers of nations for direct laser intercomparisons.

In July, a laser intercomparison program was centred on Australia's National Measurement Laboratory and, in addition to the BIPM team, brought together the laser length standards (and scientists) from Australia, Korea, New Zealand, Singapore, South Africa and Taiwan. Two weeks of intensive measurements and discussions resulted in a very successful outcome. All lasers had frequency offsets that were less than three times the standard uncertainty of their nominal frequency and most were within one standard uncertainty.

Participants voted intercomparisons of this kind as the best way to transfer information and expertise, and to create a much closer shared understanding of length standard technology in the region.

The NML-Indonesia Connection

Since early 1994, staff of the National Measurement Laboratory have been working with staff of the Indonesian national standards organisation, **Kalibrasi, Instrumentasi Dan Metrologi, Lembaga Ilmu Pengetahuan Indonesia** (KIM-LIPI), Indonesian Institute of Sciences, to improve its measurement capability. Initially, the collaboration has covered the fields of force, length and resistance measurements, but work on other quantities such as pressure measurement will begin later this year.

Dennis Tyrrell and Donald Groeneveld, staff members of NML and both NATA assessors, recalibrated the KIM-LIPI force standardising machine during September 1994. They returned in June 1995 to conduct a series of theoretical and practical courses on measurement theory in general, and force measurement in particular. This is in preparation for the first force intercomparison between the two laboratories, leading to international recognition of Indonesian measurement capability in this field.

Another departure

Max Purss has been with NML for some twenty years where he has worked in dimensional metrology. For the past twelve months, Max has been on secondment to NATA where he has been involved in project work including assisting laboratories come to grips with the new ISO Guide on uncertainties of measurement and providing workshop style courses on the subject.

Max has now joined NATA on a permanent part-time basis. One minor detail, however, is that he has moved to the Queensland office! We wish you all the very best Max in your new role at NATA.

EMC AND YOU

EMC (electromagnetic compatibility) relates to the ability of an electronic or electrical device to coexist with other such devices, being neither a bother to nor bothered by them.

A device which emits signals which can compromise the operations of another device is a source of electromagnetic interference (EMI). One which is prone to such interference is described as exhibiting electromagnetic susceptibility (EMS).

Interference can be either conducted or radiated. Conducted interference enters via cabling, either power or data, or via the casing of a device. Noise coming in via the power cable is something most people are aware of, but all cables attached to a device should also be considered as potential sources of interference. Static discharge may also cause problems.

Radiated interference can enter a device through an inadequately shielded case, through apertures in the case or via cables entering the device which can act as antennas.

Most things are not supposed to radiate such emissions. Poor design and manufacture explains many of the sources of interference. There are, however, many potential sources of interference which are quite legitimate. Any form of radio transmitter which is licensed may cause interference including TV and radio stations, mobile phones and so on. The power authorities send switching signals over the power lines which can cause interference in some situations.

The other half of EMC is immunity. While manufacturers try to make things which will not emit, the other factor is to make them immune to interference or, put another way, so that they are not susceptible to interference.

Which ever way it enters and whatever the cause, the results of interference can range from minor annoyance through to disaster.

Almost everyone has been agitated at some time when the television program they have been viewing has become unwatchable because of another appliance or electronic device causing interference. One recently reported example of interference causing both irritation and complete bewilderment was that of a washing machine, having various microprocessor controlled functions, starting up by itself at 2 am every night. The problem was identified as conducted interference via the power cable.

Somewhat higher on the frustration scale is when a glitch through the power supply has cost several hours work on the PC. The situation can become life threatening in circumstances where there is interference with life-support systems in hospitals or with aircraft control systems.

Metrologists are not immune. In a laboratory environment, EMI can result in instrument damage, loss of data, or more subtly, corruption of data. Care should be taken with cabling and with instrument positioning. With computers and automated data acquisition systems being used so widely in the laboratory these days, a good measurement person cannot afford to ignore the subject.

Even if EMI does not appear to be a problem at the moment, the situation is growing worse every day. The explosion in electronic technology and usage in the communications industry can only make the issue more pressing.

The main body responsible for overseeing the management of the radio frequency spectrum and the control of unwanted emissions is the Spectrum Management Agency, a federal government authority. The SMA is introducing an EMC framework from the 1 January 1996 which will set limits on the amount of radio frequency emissions produced by a wide range of products.

The first step in addressing EMI has been to make people aware that there is a problem. The SMA in conjunction with the Australian Electronics Development Centre (AEDC) and the Department of Industry, Science and Technology (DIST) have produced information packages and awareness courses. EMC networks have also been established in most states to provide an information resource to industry.

The EMC framework itself will require products to meet Australian and International standards. Compliance with these standards will in most cases have to be determined by testing. Any such testing will have to be carried out in a NATA accredited laboratory or one accredited by body having a Mutual Recognition Agreement with NATA.

There is a standard covering industrial, scientific and medical equipment (ISM), AS 2064 which is a clone of the international standard, CISPR 11. The costs involved in having equipment tested would preclude an individual from having their equipment tested but, from the 1 January next year, you should start to see that such equipment being marketed will have a compliance marking indicating that it meets the relevant emission limits.

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CONFERENCES AND COURSES

INAUGURAL MSA NATIONAL CONFERENCE

The inaugural MSA National Conference is all set to go and is awaiting your registration (if you haven't registered already). The program has been finalised and most of the papers are ready for the printers. [I say most because mine is not! Ed] You will find the full conference program on the following pages.

One aspect which has been very important to the planning of the conference has been the level of sponsorship provided by a number of organisations. The several thousand dollars which this has injected into the event by our sponsors has allowed the organising committee to include several elements which were originally considered pipe-dreams by the national committee and has also permitted the cost to participants to be very low. We offer a very sincere thank you to:

Australian Government Analytical Laboratory
Bellinger Instruments
CSIRO National Measurement Laboratory
Gawler Instruments
National Association of Testing Authorities
National Standards Commission

Thankyou too to the Conference Sub-Committee for their incredible effort.

Keynote Speaker

We are delighted to report that the keynote speaker will be Professor Paul de Bièvre from the European Community's Institute of Reference Materials and Measurements.

Technical Visits

On the afternoon of Day 2, you will have three options for technical visits. You can tour of National Measurement Laboratory or head off to either the National Standards Commission or to the Australian Government Analytical Laboratories (AGAL).

Trade Displays

Trade displays will provide the opportunity to see some of the latest metrology instrumentation during breaks in proceedings.

Social Activities

Don't forget the Conference Dinner cruising Sydney Harbour aboard the Matilda II on the Thursday night and the concluding BBQ on the Friday. Both will be an opportunity talk about things dear to a metrologists heart.

Travel

We are grateful to Ansett Airline who have given us a very generous 40% off airfares to and from the conference.

Accommodation

The following hotels are offering conference rates. Make sure you let them know when you are booking that you are attending. The Artarmon, Dunmore Lang College and the Ramada are within twenty minutes of NML. The tariffs quoted are for room only.

- Artarmon Inn, 472 Pacific Highway, Artarmon
Ph: 412 1644 \$90
- Centra Hotel over North Sydney Station
Ph: 9955 0499 \$125
- Dunmore Lang College at Macquarie University
Ph: 888 1122 \$55
- Ibis Hotel, Darling Harbour
Ph: 563 0888 \$97/\$107
- Ramada Macquarie, Herring Road, North Ryde
Ph: 888 1077 \$159

Please check the various accommodation guides available if these aren't to your liking.

This is **YOUR** conference and it will only be successful with the support of as many Members as possible. Please come and make sure that it is the first of many.

Dates: 29 November to 1 December

Venue: National Measurement Laboratory
Bradfield Road
LINDFIELD NSW 2070

Cost:	Members	\$200
	Non-members	\$235
	Students	\$110
	Any single day	\$125

Contacts:	Kerry Marston	(02) 888 3922
	Glenda Sandars	(02) 413 7087

UNCERTAINTY OF MEASUREMENT COURSE ON THE ISO GUIDE

There will be no more sessions of this course run in 1995. If you have missed out this year, it is expected that the course will be run again in 1996 with one session in Sydney and one in Melbourne.

Fee: \$680 all inclusive
Contact: Mrs R Crawford
CSIRO Division of Applied Physics
Phone: (03) 542 2965 Fax: (03) 544 1128

THE AUSTRALIAN METROLOGIST

CONFERENCE PROGRAM

Day 1: Wednesday, 29 November 1995

Time	Program		
9.00	Registration and Coffee		
10.30	Welcome and Introduction - John Miles, President MSA Keynote Address - Prof Paul de Bièvre <i>Prof de Bièvre has been at the forefront of recent developments towards an international chemical measurement system and comes to us from the European Community's Institute of Reference Materials and Measurements.</i>		
	A. Dimensional Metrology. Chair: Mr P E Ciddor	B. Electrical Metrology Chair: Dr J D Hunter	C. Chemical Metrology Chair: Dr L W Besley
11.15	Vision-Based Optical Systems for Large Scale Dimensional Metrology. <i>C. S. Fraser, University of Melbourne</i>	Standards and Calibration Systems for Telecommunications; Telstra's Perspective <i>R W Pyke, Telstra</i>	Why Can't the Mole be More Like the Metre? <i>H Liddy, NATA.</i>
11.45	The Realisation and Dissemination of Length Standards in Australia. <i>N Brown, J Miles, NML</i>	A Summary of Radiated Electromagnetic Susceptibility Measurements for Pattern approval Testing at the National Standards Commission. <i>K Brown, NSC</i>	Searching the Mole: Legal, Institutional and Technical Factors in Practical Traceability for Quantitative Chemical Analysis. <i>G Price, NSC</i>
12.15	LUNCH		
13.15	Training in Dimensional Metrology: The role of TAFE Colleges. <i>P Hogbin, Sydney Institute of Technology</i>	Demonstration of Electrical Measuring Equipment (tentative)	Applied Radionuclide Metrology for Nuclear Medicine <i>S M Buckman, H A van de Gaast, ANSTO</i>
13.45	Error Analysis of Measuring Coordinate Alignment on the Coordinate Measuring Machine. <i>G C I Lin, L Wang, University of South Australia</i>		Chemical Metrology, Application for the Measurement of Trace Level Organics in Complex Matrices <i>R G Millar, AGAL</i>
14.15	Laser Interferometers in the Dimensional Calibration Laboratory <i>H Seiker, A.C.M. Laboratory</i>	Demonstration of Electrical Measuring Equipment continues (tentative)	Ruggedness Testing of High Performance Liquid Chromatography Methods Using Saturated Factorial Designs <i>M Mulholland, UNSW</i>
14.45	Gear Metrology <i>P A Mayo, Gear Consulting Service</i>		Commercial Implications of Chemical Metrology <i>D Clarke, Analchem</i>
15.15	Error and Capability of a Laser Displacement Measuring System in an In-process Measurement <i>R Ramakrishnam, N Chen, RMIT</i>		Qualimetrics in the analytical Chemistry Laboratory <i>U Bonzol, G Chalker, R Greenaway, B Hibbert, UNSW</i>
15.45	AFTERNOON TEA		
16.00	PANEL & DISCUSSION Skills and Training in Metrology & Calibration Chair: Dr John Miles <i>A panel of four speakers from TAFE, Industry and the NSC will set the scene for discussion by presenting the different issues involved in providing a high standard of training in Metrology & Calibration and then answer questions from the floor.</i>		
17.00	AGM of the Metrology Society of Australia.		
18.00	Drinks and Nibbles.		

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Day 2: Thursday, 30 November 1995

Time	Program		
9.15	Introduction to Day 2		
	A Trade Measurement Chair: Mr J Birch	B Electrical Metrology Chair: Dr J J Lowke	C Chemical Metrology Chair: Dr D Clarke
9.30	Everyday Practical Metrology. (Followed by a demonstration in the courtyard) <i>D Gowdie, Consumer Affairs</i>	Automated Comparison tests of DC Voltage Dividers. <i>Y. Li, J Rungs, NML</i>	The Operational Analytical Laboratory and the Need for a Pragmatic Approach to Chemical Metrology. <i>R Wells, AGAL</i>
10.00	Everyday Practical Metrology, Demonstration in the courtyard continues. <i>D Gowdie, Consumer Affairs</i>	Measurement of Partial Discharge Signatures of Faults on High Voltage Stator Windings <i>R Sheehy, T Blackburn, UNSW</i>	Chemical Metrology - All International Perspective. <i>A Squirrell, NATA</i>
10.30	MORNING TEA		
			C2 Legal Metrology Chair: Mr J birch
11.00		An Unusual Metrology: The Measurement of Electrostatic Charging Tendency of Transformer Oils. <i>R Heydon, J Rungis, NML</i>	Legal Metrology - Past, Present and Future. <i>G Harvey, NSC</i>
11.30		Electrostatic Microclimate <i>F Kocijan</i>	Workshop: Chemical Metrology Convenor: <i>Mr Gary Price</i>
12.00		Design of Instrumentation to Measure the Earth's Electric field. <i>P Laughton, Yellow rock Research and Development</i>	Workshop: continues
12.30		Performance Tests of Digital Recorders for High Voltage Impulse Measurements. <i>Y Li, J Rungis, NML</i>	Workshop: continues
13.00	LUNCH		
	Technical visits		
14.00	National Standards Commission	National Measurement Laboratory	Australian Government analytical Laboratory
19.00	Conference Dinner Sydney Harbour Cruise		

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Day 3: Friday 1 December 1995

Time	Program	
9.15	Introduction to Day 3	
	A Mechanical Measurements Chair: Mr e G Thwaite	B Electrical Metrology Chair: Dr B D Inglis
9.30	New Developments in Ultrasonic Flow Metrology <i>A F Collins, NML</i>	Traceable Lidar Measurements of Vehicle Speed. <i>R R Cook</i>
10.00	Surface Texture Identification Using a Fibre Optic Transducer <i>W Scott, A Donovan, QUT</i>	The Evolution of the Australian Standard of Voltage <i>R B Frenkel, NML</i>
10.30	MORNING TEA	
11.00	A Reference Gas Volume Prover and Its Application <i>N Owen, Gas & Fuel</i>	Calibrations of AC-DC Transfer Standards in the Range of Voltages from 2 mV to 300 mV <i>I Budovsky, NML</i>
11.30	Gas Flow Standards at the National Measurement Laboratory <i>N Bignell, NML</i>	Hysteresis of Resistors <i>B J Pritchard, NML</i>
12.00	The Southern Oscillation and the Characterisation of a Kew Pattern Barometer <i>J Warne, Bureau of Meteorology.</i>	Calibration of High Value Resistors. <i>R R Cook, R G Rigby, NML</i>
12.30	Comparative Evaluation of Analytical Procedures and Uncertainty Development for Two Approaches to the Calibration of Pressure Balances. <i>W Giardini, NML; R anderson, Aust Pressure Laboratory</i>	A New 3000 Ampere Low Resistance Measuring System for the National Measurement Laboratory. <i>R Petto, NML</i>
13.00	LUNCH	
14.00	Panel and Discussion: Uncertainty & QA Chair: Mr R R Cook	
	Discussion Introduced by: - The Practical Aspects of 95% Confidence Level in Uncertainty Estimation. <i>P J Betts, NML</i> - Does the Quality Assurance Community Understand Calibration, Measurement and Traceability? A Challenge for MSA. <i>J Mitchell, NATA</i>	
15.30	AFTERNOON TEA	
16.00	Closing Speaker - Dr Bill Blevin	
16.30	Drinks and Barbecue	

THE AUSTRALIAN METROLOGIST

MEMBERSHIP NEWS

FELLOWS

The Management Committee has for some time been working on the machinery for admitting Fellows to the MSA. Input on this issue was also obtained from the membership following a call for suggestions in the last issue of The Australian Metrologist.

The Management Committee wishes to announce that we are now calling for applications for Fellows of the MSA.

It has been decided that the grade of Fellow in the MSA should be applied for using the current application form available from the Secretary. Proposers and Seconders who are currently members of the MSA are required.

Membership as a Fellow may be granted to a current Member wishing to upgrade or to a new member applying for admission as a Fellow.

The constitution of the MSA defines a Fellow as either:

- (a) *A person who has been eligible for membership as a Member for at least 5 years and who has held a position of considerable responsibility for metrology activities for not less than 5 years, or*
- (b) *A person who has been eligible for membership as a member for at least 5 years and who has made significant contributions to the art or science of metrology.*

Eligibility for membership as an ordinary Member of the MSA requires at least 5 years experience and appropriate academic qualifications or typically at least five extra years of experience for those without appropriate academic qualifications. It follows that Fellows with appropriate academic qualifications must have **at least 10 years experience** and those without appropriate academic qualifications must have **at least 15 years experience**.

The following information is offered as a guide to members as to what criteria may be considered in admitting Fellows to the MSA.

Considerable Responsibility

Considerable responsibility may include being the Head of a Laboratory, a NATA assessor, a member of a NATA Registration Advisory Committee, a member of Standards Australia technical committees, the sole proprietor of a laboratory, holding a senior position in

an Australian or international measurement organisation, contributing to the training of metrologists.

Contribution to Metrology

Significant contributions to the art or science of metrology may include attaining a higher degree in a measurement field, publishing papers in refereed journals, involvement in developing a new and significant measuring instrument or technique.

If you believe you satisfy the conditions outlined above, please contact the Secretary and obtain an application form.

NEW MEMBERS

We are pleased to announce that the following metrologists have been granted membership since the last issue. Welcome to the MSA.

New South Wales

Mr Graham Brown	Physical
Mr Noel Bignell	Physical

Queensland

Mr John Gilluley	Physical
Mr Karl Kozehuba	Multi-disciplinary
Mr Michael Ridgway	Chemical

South Australia

Dr Noel Samaan	Physical
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Tasmania

Mr Murray Gordon	Physical
Mr Ronald Plummer	Physical

Victoria

Mr Peter Kleyman	Dimensional
Mr Dale Atkinson	Physical
Mr Robert Hessing	Electrical
Mr Dagobert Vonier	Dimensional
Mr John Elliott	Physical
Mr Alan Granger	Physical

A NOT SO GENTLE REMINDER

There are still a few members who have not yet paid their subscriptions for 1995. If you wish to continue your membership, could you please send in your payment to the Secretary as soon as possible.

If you have decided not to continue, we would appreciate it if you could send a note so that we can remove your name from the register.

STATE EVENTS

QUEENSLAND

Visit to ADI Amberley Calibration Laboratory

In what at first seemed like a "defence technicians reunion", the Manager of the ADI Amberley Calibration Laboratory, Steve McNamee, extended a warm welcome to the enthusiastic group of Queensland Members.

Steve described the structure of the parent company and then outlined the facilities and services provided by his fifteen staff members, part of the Australia-wide ADI personnel totalling over 3000 persons.

Within the two main Amberley laboratories, the technologies of length, vibration, temperature and electrical (from DC up to 20 kHz) measurement were concentrated in the first temperature controlled laboratory held at the specified 20 °C. Roy Bruce and Peter Gardener (both of ADI) provided the explanations of their duties and specialist demonstration of the calibration equipment. This ranged from the simplest "hook gauge" for calibration of very low pressures to the most sophisticated processor controlled calibrations for hydraulic and pneumatic pressure and for many electrical parameters.

Moving next door to the warmer 23°C laboratory, Terry Albury was kept busy communicating his skills and expertise to the Members in the sciences of frequency and time standards, signal sources and communications equipment up to 26 GHz. Of special interest were the techniques of measuring high frequency power and the rubidium time standards included in the calibration.

In continuing their desire to be at the "strategic edge" and "right on target", Steve McNamee is awaiting formal advice of their NATA registration for the dimensional and physical metrology services [which has since been received] to add to their existing accreditation for electrical metrology and AS 3912.1 and certification to AS 9002.

Brian Philips, on behalf of the Members, spoke enthusiastically of the additional knowledge he had acquired from the meeting and extended appreciation to Steve, Terry, Roy and Peter for their time and assistance.

The following meeting which was held at the Photometry Laboratory at QUT on 31 October will be reported on for the December issue of TAM.

Roy Hood

SOUTH AUSTRALIA

Unfortunately, the dinner we were going to have in September did not happen. We will try again later.

What did happen was the visit to Pope Electric Motors and their NATA accredited motor testing laboratory. We will have a write-up on this next issue.

Brenton Watkins

VICTORIA

Visit to Ansett's flight simulator centre and engine overhaul facility

On the evening of Wednesday 30th August, twelve lucky Victorian MSA members journeyed out to Ansett Australia's Flight Simulator Centre in Tullamarine, next to Melbourne Airport. We were divided into three groups of four, with each group able to take a 20 minute "flight". Ansett operate 5 simulators, a Boeing 737-300, a Boeing 767-200, an Airbus A320, a British Aerospace BAe 146-300 and a Boeing 727-200.

These simulators accurately reproduce aircraft performance under a variety of weather conditions including variations in cloud base, visibility, wind velocity, turbulence etc. About 300 different aircraft system malfunctions can be reproduced. Visual scenes from a number of different airports are projected onto a mirrored surface outside the simulator cockpit. Accelerations and decelerations are simulated by tilting and tipping the simulator. Each simulator costs about \$20 million.

The experience is amazingly realistic. Flying under the West Gate Bridge and climbing almost vertically over the Rialto Building were two highlights. If you ever get the chance to fly in one of these simulators, do not miss it. It's well worth while.

Following our flights, we joined up with some more MSA members and visited the adjacent Ansett Engine Overhaul Facility. Since opening in 1982 this facility has overhauled or refurbished approximately 2600 engines from seven different aircraft types.

Engines account for approximately 40% of the total maintenance cost of an aircraft and the overhaul of a CF6-80A engine powering the B767 can typically cost \$A1,500,000.

The facility also provides engineering services and support to a diverse range of major public and private projects, such as the Submarine project, and services engines for airlines in the Asia-Pacific region.

We were shown all over this immense and awe-inspiring facility, impressed by the pride the Ansett

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staff take in their work. Stripping down, repairing and overhauling a multi-million dollar jet engine and then putting it back together is certainly a highly skilled and responsible task. Measurement is a vital component of this work.

All involved thoroughly enjoyed our visit to Ansett and the MSA would like to thank Ansett for their hospitality. In particular, we would like to thank Ian Ogilvie, a member of the MSA, for organising the visit.

A report on the visit to the Gas and Fuel laboratories at Highett will appear in the December issue of TAM.

John Miles

STATE CO-ORDINATORS MEETING

Following the Annual General Meeting on the 29 November, there will be a meeting of the State Co-ordinators and the Management Committee to discuss the future of State groups.

The future of the MSA as a truly national organisation is dependent upon having state groups or chapters which can offer the membership in each state effective communications and activities which will be both interesting and useful.

One of the concerns which the national Committee has had is to ensure that the various groups are given the resources and freedom to tailor their activities to the needs of the membership.

The Co-ordinators' meeting has been organised to look at issues such as financing and management and to examine possible structures, including that of the national Committee, to best facilitate these aims.

It is not the intention of this meeting to impose a structure on the membership. It is to examine some models which have been proposed and to consider the needs of each state which obviously differ for reasons of numbers and "the tyranny of distance". Any proposals which result from the meeting will be conveyed to the membership for consideration. As any such proposals may require changes to the Rules of the Association, these would have to be brought to the Members at a Special General Meeting.

If you have any ideas on how things could be improved, either at the local or national level, please let your State Co-ordinator know ASAP, preferably in writing.

Also, if you think that something is being done well, tell someone. Otherwise we might fix it!

SNIPPETS

A word of thanks and farewell

Kerry Marsden has worked very hard over the past few months as one of the NSW Coordinators and a member of the Conference Sub-Committee. Unfortunately, Kerry and her husband are heading off to China for two years.

On behalf of everyone in the MSA, we wish you both all the very best and to Kerry, a very special thankyou for all of your efforts. Make sure that you leave a forwarding address so that you won't miss TAM.

Cabinet Consideration of Kean Report delayed

As of writing, the Kea Report is yet to be discussed in the Federal Cabinet. The report recommends over fifty changes to the structure and functioning of the key elements of the national measurement system, that is Standards Australia, NML, the National Standards Commission and NATA.

The made submissions to the enquiry and on the findings of the report (see issue 5). We now await the outcome. It is just possible that the Government has other things on its mind!

BEAUTY AND THE BEAST

Would you like to see the stage production of *Beauty and the Beast*? The MSA has a group booking for the evening of:

Wednesday 13th March 1996

at

**The Princess Theatre
132 Spring Street
Melbourne**

The group booking gives us a 10% discount on the normal ticket price. The MSA prices are \$61.10 per person for adults and for children and those giving a pension card, \$48.10. The group booking gives us a 10% discount on the normal ticket price.

As we need to confirm the booking, we need to have your full payment by the end of November. Please make cheques payable to the MSA and send them to:

Mr Ron McBain
32 Philip Avenue
Doncaster VIC 3108
Phone 03 9852 0466
Fax 03 9852 0466

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MANAGEMENT COMMITTEE ELECTION

The election of the Management Committee will take place at the Annual General Meeting to be held on Wednesday 29 October at the NIL.

Unfortunately, Glenda Sandars has decided she must say "no" to a few things and will not be nominating for the Committee. Anyone who knows Glenda also knows what an incredibly busy person she is. For her contribution and her cheerfulness in the face of adversity, we say "thankyou Glenda".

All other members of the Committee have indicated that they will nominate for re-election. To enable the membership to make an informed decision, the following brief biographical notes are included.

Office Bearers:

President: Dr John Miles is a Senior Physicist with the Melbourne Branch of CSIRO Division of Applied Physics. John has been with CSIRO for 14 years, and has been involved in length, angle, pressure, flow and volume measurement. He now has responsibility for length and angle standards maintained at the Branch. John can take credit for dreaming up the MSA and has been involved in its creation from day 1 (which was lunch at a pub in Prahran with Ron Cook, Colin Wagg and John Mitchell) and chaired the steering committee which established the Society.

Vice-President: Dr Barry Inglis is Chief Standards Scientist and Deputy Chief, Standards with the CSIRO, Division of Applied Physics, National Measurement Laboratory. Barry is also the Coordinator of the Asia Pacific Metrology Programme (APMP), a member of NATA's Council and Executive and a National Standards Commissioner. (He has more hats than you'd see at the Melbourne Cup). For those who may not know, Barry's background is in electrical metrology with a special interest in AC measurement, particularly in AC/DC transfer.

Treasurer: Stuart McDonald is the laboratory supervisor of CitiPower's (formerly the SECV) electrical standards and high voltage laboratories at Richmond in Melbourne. Stuart Started with the SECV in 1969 and has been in the laboratory for the last 27 of those years. Up until recently, Stuart was multi-skilled in that he was also responsible for Citipower's photometric standards and testing laboratory. To quote Stuart, he's

"nearly fifty and stressed".

Secretary: Colin Wagg is Manager, Metrology with the National Association of Testing Authorities (NATA). Colin has completed sixteen years with NATA where he has managed the Electrical Testing and Metrology fields of laboratory accreditation. Prior to Joining NATA, he worked for CSIRO Division of Atmospheric Physics and the Victorian Weights and Measures Department being involved in a range of calibration activities with both.

Members:

Mr Bill Cerutti is Head of Hewlett Packard's Standards Laboratory in Blackburn, Victoria. His laboratory has a DC to daylight capability (in terms of frequency) and is NATA registered for most of its capability. Bill has been in the field of electrical metrology for twenty years. As a member of the Membership Qualification Sub-Committee, Bill has been lumbered with the task of compiling a summary of the multiplicity of qualification held by members. A dull business but Bill still manages to smile! Through HP, Bill also provides us with a link to the National Conference of Standards Laboratories (NCSL) in the USA.

Mr Jack Deller is Secretary of the Membership Qualification Sub-Committee and Chairman of the Communications Sub-Committee and edits *The MSA Bulletin*. Jack "retired" from Defence Quality Assurance Organisation where he was head of the dimensional metrology laboratory in Melbourne. After thirty-five years in various defence laboratories, he now runs his own consulting business called LaMets.

Dr Grahame Harvey is Deputy Director of the National Standards Commission in Sydney. Grahame [whose name I tend to spell incorrectly] has a great enthusiasm for metrology education and has been heavily involved in the development of the metrology training initiatives in the TAFE system. The NSC has responsibility for administering the National Measurement Act, trade measurement and pattern approval for measuring instruments used for trade purposes.

Mr Ron McBain is Director of Quality Metrology Services which provides a calibration service for dimensional metrology instruments. Ron is Chairman of the Social Sub-Committee and a member of the Communications Sub-Committee. He has well over thirty years of dimensional metrology experience gained in the former

Ammunition Factory laboratory in Melbourne where he became the laboratory manager. Until his retirement from defence, Ron was secretary of the Co-ordinate Measuring Machine (CMM) user group.

Mr John Mitchell is Manager, Electrical Testing with NATA. John has been with NATA for six years where he has undertaken laboratory assessments in a wide range of calibration, measurements and testing disciplines. Prior to joining NATA, he was employed as a Technical Officer with the University of Melbourne for several years where he gained experience in both research and consulting laboratories, the latter being in the area of optics and radiometry. John is Editor of *The Australian Metrologist* and a member of the Communications Sub-Committee.

Mr Horst Sieker is the Managing Director of ACM Laboratory in Moorabbin. ACML was founded by Horst's father. Carol Sieker, Horst's wife, works with him in the laboratory and so it is very much a family business. The laboratory calibrates a wide range of dimensional metrology equipment and some physical metrology equipment. Horst and Carol have demonstrated a tendency to be rather innovative and are always looking for new and better ways of doing things. Horst is also a member of the Membership Qualification Sub-Committee.

Dr Jane Warne is a Senior Physicist with the Bureau of Meteorology [no - i have not misspelt it] and has responsibility for the calibration of much of the Bureau's measurement equipment. As well as calibration of the Bureau's instrumentation, her staff are involved in trialing new instrumentation and dealing with some of the problems associated with remote monitoring equipment (which can sometimes be quite bizarre). Jane is a member of the Communications Sub-Committee. Despite being a physicist at the Bureau, Jane is a chemist by training and provides an important link with chemical metrology.

SORRY ALEX

Last issue, Alex Smart asked in a Letter to the Editor some questions about how you measure airbourne concentrations of eucalyptus and what is the threshold level for the sense of smell.

Unfortunately, I have not obtained an answer to the questions as yet. I will do my best to put the hard word on one of our chemical metrologists for the December issue. [Ed]

ERRATUM

Oh dear - we're not perfect! On page 7, Issue 5 of *The Australian Metrologist*, there was an error in the article **In Search of the Perfect Sphere** by Walter Giardini. In paragraph 2, the diameter of the sphere should have read 93.6 mm, not 96.3 mm. The error was discovered by Mr Tony Meola and kindly transmitted to the author by MSA Member Mr Ian Richards, both from the Western Metropolitan College of TAFE.

Mr Meola detected the error by performing a cross check on the density of the silicon ball, calculated using the given dimensions and the mass of 1 kg, to find that this did not agree to within an acceptable degree with the standard tabulated values for silicon.

WANTED TO SELL/BUY

This new service will be available from the next issue of *The Australian Metrologist*. If you have some second-hand **metrology related items** which you wish to sell, contact the Editor.

Wanted to Sell advertisements will not be accepted for new equipment, services or items which cannot reasonably be considered to be metrology related. The editorial policy that *The Australian Metrologist* will not accept commercial advertising continues at this time.

Advertisements will be accepted from Member's organisations but, in such cases, the member must act as the agent and contact person.

Please observe the following guidelines.

- Length: not more than 6 lines (approx 50 words)
- Content: brief description of item(s)
- Condition: EC - excellent, VGC - very good, GC - good, FC - fair, NW - needs work
- Price: must be included
- Contact: Phone/fax number including STD code or, if selling on behalf of employer or business, the member's name and organisation name.

Cost:	Wanted to Sell	\$6 flat rate
	Wanted to Buy	no charge

When lodging advertisements, please quote your membership number.

THE METROLOGY SOCIETY OF AUSTRALIA

NOTICE OF ANNUAL GENERAL MEETING

WEDNESDAY 29 NOVEMBER 1995

AT

**THE LEHANY THEATRE
NATIONAL MEASUREMENT LABORATORY
BRADFIELD ROAD
WEST LINDFIELD NSW**

COMMENCING AT 5:00 pm

The business of the meeting will be:

1. Confirmation of the minutes of the Annual General Meeting
held on 19 October 1994
2. Receive Committee reports
3. Election of officers of the Society and ordinary members of the Committee
4. General business

In accordance with the constitution, the Committee is calling for nominations of candidates for election as officers of the MSA or as ordinary members of the Committee. The nominations must be made in writing, signed by two Members of the association and accompanied by the written consent of the candidate.
(see nomination form enclosed herewith)

**The nominations must be received by the
Secretary no later than 21 November 1995.**