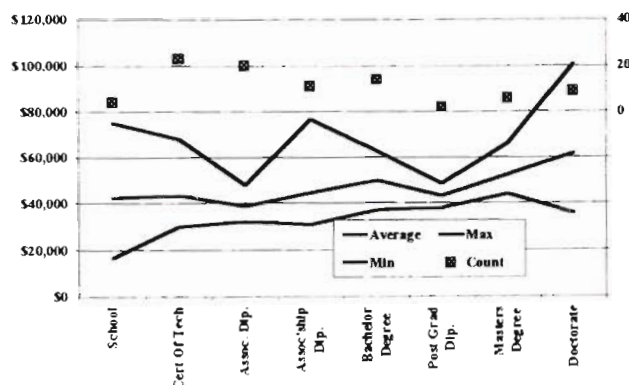


THE AUSTRALIAN METROLOGIST

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Results of Salary Survey Page 3

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FROM THE PRESIDENT

I was standing in the wind and rain recently at the plant of a large LPG supplier, watching a road tanker pump LPG through a flow meter to a small volume prover and then back to the tanker. We were waiting for the system to come to thermal equilibrium before calibrating the flow meter using the prover as a reference standard. A prover is a volume standard consisting of a large cylinder and a piston that delivers a known volume of liquid, much like a giant syringe.

It sounds simple. Connect the flow meter to the prover in series, pass LPG through both and compare the volume delivered by the prover with what the flow meter says passed through it. Repeat for different flow rates across the range of the flow meter.

Of course, nothing is simple! The meter, prover and the LPG volumes depend on temperature and pressure. The change of LPG volume with pressure depends on the LPG compressibility which in turn depends on the LPG composition. LPG composition varies from State to State and from supplier to supplier. We therefore needed to measure the LPG vapour pressure and density. We also had to ensure that the electronic circuitry that started and stopped the pulse counter on the meter and counted pulses was functioning correctly.

Coordinating the availability of the LPG tanker, the small volume prover, the flow meter and the associated people is a nightmare in itself. LPG tankers are expensive to operate and run and management does not take kindly to having one sit around all day pumping LPG around a loop.

So standing there in the wind and rain, I thought how ironic it was that many people believe that NML only makes super-accurate measurements in almost perfect conditions. It's true that most of my calibration work at NML Melbourne Branch involves measuring length, angle and engineering metrology standards in an air-conditioned laboratory with uncertainties ranging from 1 - 10 parts in 10^7 . However, I have also been involved for many years in calibrating volume standards, and more

recently flow meters, for the petroleum industry. These measurements are made on-site with all of the associated difficulties (bad weather, lack of facilities, bureaucratic obstacles) and have relatively high uncertainties, typically 0.02 to 0.1 %.

These thoughts led me to consider the hierarchy of metrologists and measurements. Unfortunately, there is a view by some that measurements such as the flow meter calibration, made on-site and with high uncertainties, are of low status in the metrology world.

Generally, the view is that the lower the measurement uncertainty, the more expensive the equipment and the closer the measurement is to the National Standard, the better and more important the measurement and the metrologist. This view would place NML, NSC and the "higher-level" NATA laboratories and their staff at the top of the tree, followed by "lower-level" NATA laboratories and then measurements in industry and commerce at the bottom.

I do not agree with this view, as I believe it mistakes the traceability chain for a hierarchy of status or importance. It has the damaging effect of underestimating and undervaluing the skills required of metrologists when performing the vast majority of measurements in Australia, namely those with high measurement uncertainties in generally difficult circumstances at the bottom of the traceability chain.

Examples of these measurements include determining the flow of crude oil through a meter at midnight in a stormy sea on an oil rig in Bass Strait with an uncertainty of 1 part in 10^3 ; measuring the chemical composition of pharmaceutical's in a production line with an uncertainty of 2%; testing the strength of concrete with an uncertainty of 5%.

These measurements all have relatively large uncertainties and rely on more accurate measurements flowing down to them from NML through the traceability chain. They also all have very significant economic consequences and are

Cont' next page

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From the Presidents cont'

difficult to perform correctly, often requiring as much skill and knowledge as measurements performed at the National Measurement Laboratory.

My point is this: The value of a measurement and a metrologist should not be based only on position in Australia's measurement system. The skills and knowledge of the metrologist and the integrity and quality of the measurement are important at all levels, from inspecting gauges on the tool room floor to maintaining Australia's length standard with an iodine-stabilised HeNe laser.

*This leads me to my next challenge! Conference brochures on our 2nd MSA Biennial Conference, to be held in Melbourne in November 1997, were included with the last TAM. To date, the great majority of abstracts have come from NML, NATA, NSC, and from overseas. Considerably less have been received from metrologists working in industry. The conference organisers are concerned as they want to ensure a balanced program. So, my challenge is, if you believe, as I do, that metrologists at all levels in the traceability chain have knowledge and skills worth sharing, **submit an abstract!***

Finally, it's great to see MSA committee man and TAM editor, Jack Deller, back in action following his triple-bypass operation last March. Jack does a tremendous amount of work for the MSA and we are all delighted to see him looking so well and back in action.

On a more personal note, my thanks to those MSA members who sent their best wishes and a card following my own health problems in April. I am now fighting fit again having given birth to a healthy kidney stone (Ouch!).

John Miles

Editors Column

Here we are again with edition number 11 and only a couple of weeks late.

I guess you noticed the cover of our magazine. It is our first step in up-grading the journal I mentioned in the previous issue. While it is all very nice to have a presentable publication the main issue is content and I am still having difficulty in obtaining copy in the timescale set down.

Please, have your say via TAM. Anything you find of interest relevant to metrology will be of interest to other members. So, before filing it in the WPB consider it as an article in TAM.

You will be interested to know that we have had three inquiries from overseas metrologists wishing to gain more information on our society. This is a direct consequence of our web-page so people out there are interested in the MSA.

Our WebMaster (Adrian Ward) has suggested that members should forward their email addresses to him to permit the society to use that form of communication when appropriate.

Homepage: <http://www.ozemail.com.au/~ausmet/>

Email: ausmet@ozemail.com.au

As you would have noticed in John's column both he and I have had a bit of a health hiccup since our last edition but we are both greatly on the improve now.

Having had my first experience on an operating table in my life I now have even greater respect for the medical fraternity of our society.

In my case the cardiologist assures me that the worry of trying to gather info for this magazine was not the cause, but noted my 48 years of being a Geelong Football Club supporter as being the biggest risk factor.

But, to save any more heart problems would all you sub-editors out there remember the next deadline is **20th July 1997**.

I would also like to thank those colleagues who visited me in hospital and phoned or sent cards. It is very comforting to know you have gathered so many friends during your working life.

Jack Deller

MSA Salary Survey 95-96 Part 1

Prepared by Dr. Jane Warne Senior Physicist
Bureau of Meteorology Melbourne

(Jane is also a MSA Management Committee member)

This is first of a two-part analysis and discussion of the MSA Salary Survey 95-96. This article will give a brief summary of the key results and discuss in more detail the remuneration results of the survey. The second article, which will appear in the next edition of *The Australian Metrologist*, will look more at the areas of work and will include the 96-97 Salary Survey.

The response to the survey was good with 98 surveys being returned. It was also pleasing to find that the responses were representative of the overall membership. 93 respondents were male, 4 female (one survey did not identify the gender of the respondent). The breakdown by locality was also reasonably representative with 39% from Victoria, 30% from NSW, 15% from Queensland, and 6%, 4%, 3%, 2% and 1% from South Australia, Western Australia, Tasmania, Overseas and Northern Territory respectively. There were no responses from the ACT. The representativeness of the survey allows meaningful conclusions to be drawn from the results.

Who is the typical MSA member?

From the survey the following picture of a typical MSA member can be drawn. They are 45 years old, male and are a full time employee.

They have a Certificate of Technology and are working in an engineering or scientific position using their metrology skills. They have worked in the area of metrology for an average of 16.5 years and have been in their current position for approximately 5 years. They work for a private company in the area of test and calibration and this forms 100% of their duties. Typically they work 35 to 40 hours per week, which is approximately the same amount of time as last year, and have not changed jobs in the last twelve months. They received an average salary of \$44,654 in 1995, which was a 2.2% increase on 1994. They received additional allowances of approximately \$1400. They have superannuation to which they contribute 5% and their employer contributes 5%. This results in a total package of approximately \$50,500 per

year. The person became involved in metrology because it formed apart of their work duties.

Their training, as a result, was a mixture of both formal and on the job training.

Remuneration.

Breakdowns of remuneration by qualification and by work responsibility are given in Figures 1 and 2 respectively. Note superannuation figures were not included in these plots because of some significant inconsistencies in the data received. (This will be discussed in a later article). The average remuneration of a school leaver was \$42,488 while for a person with a doctorate it was \$61,732, a range of \$19,244. The median remuneration showed a similar trend varying from \$38,975 to \$60,000. It was interesting to note that although the top salary earner had a doctorate the second and third top highest qualification was an Associate Diploma and a school leaver respectively. A similar egalitarian range of salaries was observed when remuneration data was analysed as a function of whether the person is working in or outside metrology as an engineer/scientist or technician.

There was no significant difference between any of these groups. That is, engineers and technicians on average received the same remuneration.

Figure 2 demonstrates that the highest paid jobs were as expected in the areas of research and development and management. This trend was also observed in the analysis of remuneration by industry, with highest paid sectors being the research and development and the lowest being the education sector.. The interesting observation from the analysis of salaries was that there was no real difference in the pay structures of private (\$45,300) and public organisations (\$47,800). However independent organisations did pay slightly more, \$60,000 and tertiary institutions somewhat less, \$34,000.

In the next part of this study of remuneration and make up of the MSA I will discuss the comparability of pay rates to other industries and investigate more fully the character of a MSA member.

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Figure 1 Average maximum and minimum salaries and allowances for different qualification levels.

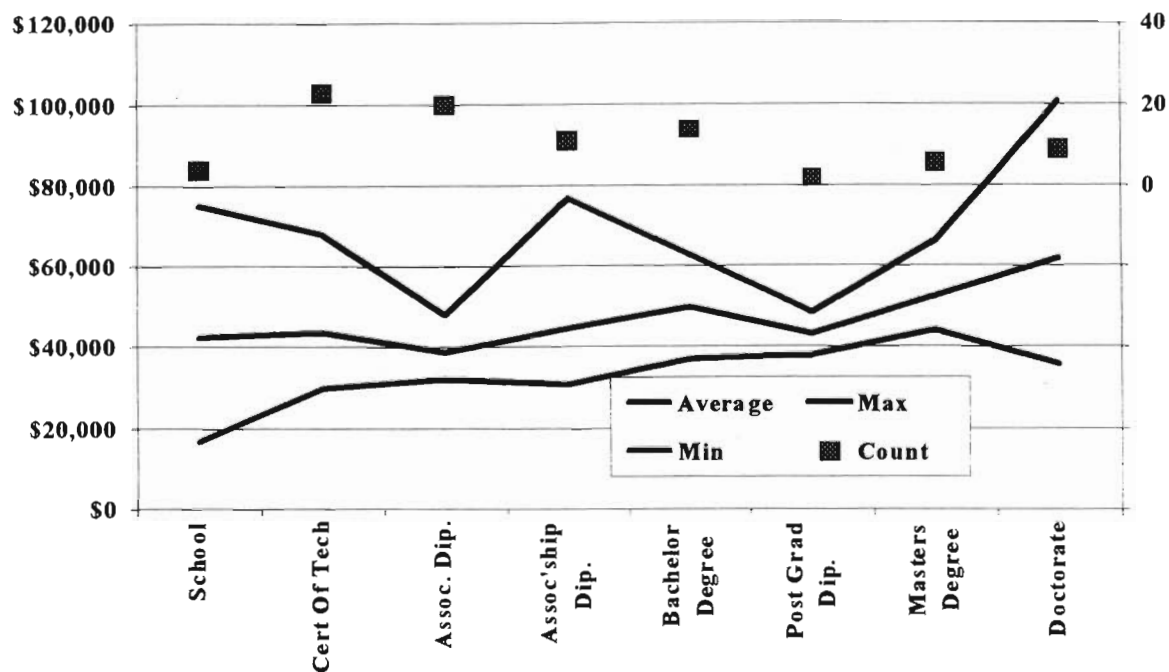
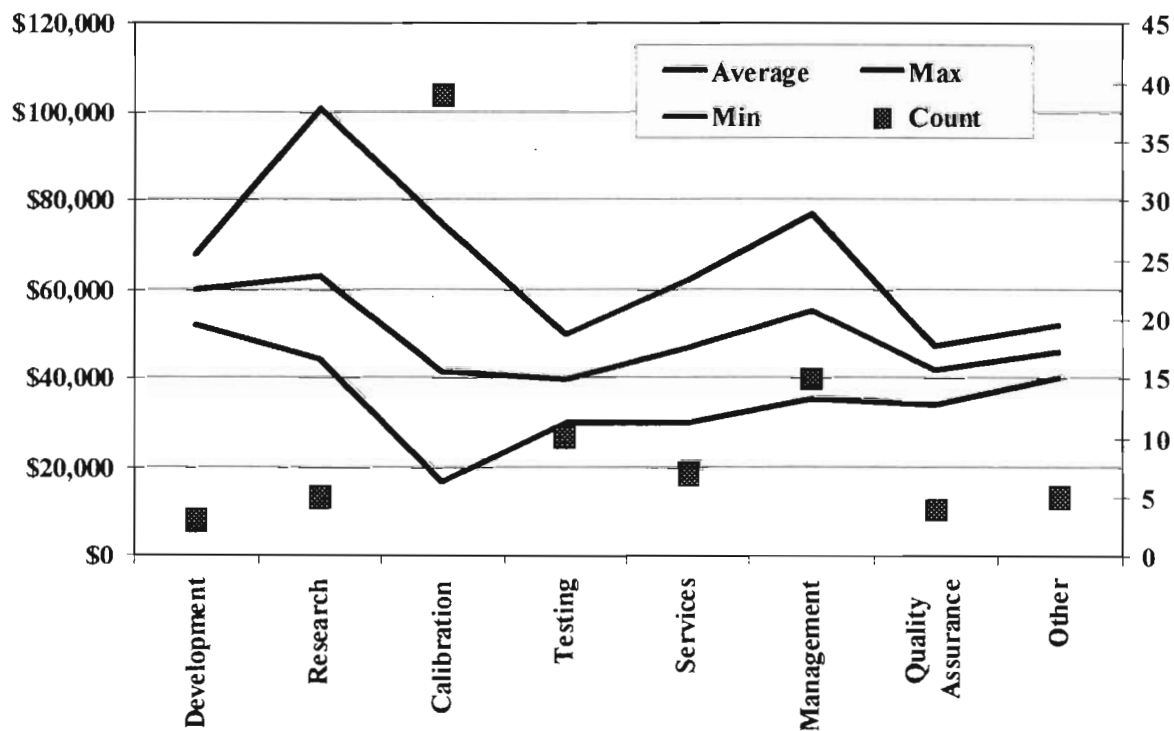


Figure 2 Average maximum and minimum salaries and allowances for different work responsibilities.



News from the National Measurement Laboratory

NML achieves National Facility Status

In February, 1997, Australia's National Measurement Laboratory was officially designated a "National Facility", ratifying one of the recommendations of the 1996 Kean inquiry into Australia's standards and conformance infrastructure. Dr Barry Inglis, previously Chief Standards Scientist of NML, has been appointed the Director of the new facility. NML remains within the auspices of Australia's peak scientific organisation, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), as part of CSIRO's Division of Telecommunications and Industrial Physics.

New primary standard for radiometry

A cryogenic radiometer is the new Australian primary standard for radiometry. This electrical substitution radiometer is cooled to 4.2 K to take advantage of the thermodynamic properties of metals at this temperature (the thermal conductivity of the radiation detector, for example, is much greater than at room temperature). The cryogenic radiometer is used at discrete laser wavelengths to calibrate secondary standards (trap detectors) to extend the scale from 400 nm to 900 nm with an accuracy of about $\pm 0.02\%$. The radiometric scale at 1300 nm, an important wavelength for fibre optics, has recently been linked to the new primary standard. Work is under way to link the photometric units to the cryogenic radiometer using transmission trap detectors as the transfer mechanism.

Transfer detectors have also been used to compare the radiometer with its counterpart at the BIPM in the first stage of an international intercomparison. The two radiometers were found to be in good agreement.

Extension of NML's EMC Facilities

NML's calibration service for EMC measuring equipment now caters for the absorbing clamps used in disturbance power measurements, and will soon extend to the electrical fast-transient/burst

(EFT/B) generators used to test for immunity to conducted disturbance (IEC 1000-4-4). 1998 will see the introduction of a calibration service for field strength probes from 25 MHz to 1 GHz at field strengths up to 20 V/m. Such probes are used to test for immunity to radiated disturbance (IEC 1000-4-3).

Australia/New Zealand audits by the Federal Aviation Administration, USA

Early in 1997, the US Federal Aviation Administration conducted a round of its periodic audits of Repair Stations in Australia and New Zealand. The FAA legislation requires that Repair Stations demonstrate traceability of measurements to the National Institute of Standards and Technology (NIST) in the USA, and auditors were directed to give a literal interpretation to this requirement. Clearly it would not have been economic or feasible for Australian organisations to ship all equipment requiring calibration back to the USA so the National Measurement Laboratory and the National Association of Testing Authorities, Australia, made representations to the FAA to accept that traceability through the Australian measurement system to NML is equivalent to traceability to NIST. Assisted by colleagues at NIST, NML and NATA were successful in gaining FAA's acceptance of the Australian system and Australian organisations who are dealing with FAA will be able to source calibrations either directly from NML or from a calibration laboratory which holds the appropriate accreditation from NATA. The form of the NML and NATA-endorsed reports which will be accepted by FAA auditors is still under discussion with NIST and FAA but this matter should be finalised shortly. Organisations requiring up to date information should contact NML (Glenda Sandars; ph: (02) 9413 7087) or NATA (Ian Bentley; ph: (02) 9736 8222).

Cont. on next page

NML cooperation with APLAC

NML, through the National Association of Testing Authorities, Australia (NATA), is assisting the Asia Pacific Laboratory Accreditation Cooperation (APLAC) conduct proficiency testing programs among accredited laboratories in the Asia-Pacific region. APLAC members have identified the following as important measurement areas requiring attention: engineering metrology, force, pressure, torque, frequency, RF power and attenuation, capacitance, inductance, sound level, vibration, illuminance, flow, hardness and temperature. NML's contribution has been to maintain an artefact bank covering these areas for use by NATA and other APLAC members for carrying out proficiency tests, measurement audits and intercomparisons. NML is being funded by the Department of Industry, Science and Tourism (DIST) for the purchase of the artefacts and for their characterisation.

The Asia-Pacific Metrology Programme (APMP)

With the unanimous approval of the 22 Full APMP Member laboratories, two economies have joined Egypt in the new category of "Associate Member" of the Asia-Pacific Metrology Programme - South Africa, through its National Metrology Laboratory, CSIR; and Brunei Darussalam, through its Construction, Planning and Research Unit, Ministry for Internal Development. All Full and Associate Member laboratories are anticipated to formalise their commitment to achieving the objectives of the Programme by signing the APMP Memorandum of Understanding (MoU) by 1 July, 1997. The establishment of this document marks an important step in the Programme's evolution. A draft APMP Mutual Recognition Agreement (MRA) is also currently under consideration by Members.

The number of intercomparisons currently being coordinated through the Asia-Pacific Metrology Programme has reached 21, with measurements having been completed in the areas of spectral responsivity and electromagnetic compatibility. Participants in the APMP intercomparison program include three EUROMET laboratories, from the Netherlands, France and Germany.

The 1st APMP Working Group has been established, in the area of "Lasers and Dimensional Metrology". At this time, 18

economies are participating in discussion groups which have been set up in nine key areas: gauge blocks, length bars, thermal expansion, polygons, diameter standards, CMM artefacts, nanometrology, line standards, and stabilised lasers and interferometry. Coordinating the Working Group is Dr Nick Brown of NML.

The 13th APMP Committee Meeting will be held in the week of December 1-5 in Sydney, Australia. A one-day symposium is being organised in association with this year's meeting, "APMP Symposium on International Traceability of Measurement". The Symposium is anticipated to be held on December 3 and is open to all interested parties.

For further information about the Programme or any of its activities, please contact the APMP Secretariat, National Measurement Laboratory, CSIRO Division of Telecommunications and Industrial Physics, POB 218, Lindfield, NSW 2070 (Ph: [02] 9413 7788; Fax: [02] 9413 7383; email: angelas@tip.csiro.au).

News From National Standards Commission

CONTROLS FOR SIMULATED TEST METHODS IN PATTERN APPROVAL TESTING



The use of simulation test systems in pattern approval testing introduces a number of issues that require addressing, such as the need for guidelines for obtaining traceable calibration, and evaluation of whether the modification to the instrument affects the essential nature or the severity of the test. Measures for quality assurance of simulated test systems used by laboratories in pattern approval testing is an issue to be considered. For example, the simulation of the flow of liquid through a fuel dispenser by a stepper motor driving the measuring transducer. This is controlled by an inhouse designed software test system.

If you have any thoughts, ideas or comments on this process please send them to Ms. K. Brown at NSC fax (02) 9888 3033.

METROLOGY SOCIETY MEMBER PROFILES

Carol Sieker is the gatherer of the "Member Profile" data and it is Carol's intention to have three or four members' outlined in each issue. Carol would be most grateful if you would give her some information on yourself or a colleague (with his or her permission) for upcoming issues. (Photos are welcome.)

Ed

Jack Duce is a foundation member of the Metrology Society of Australia, and ably runs a company called Laboratory Instruments. Laboratory Instruments acquired its name originally from servicing and repairing a range of general laboratory equipment. Now, however, the company is NATA accredited and specialises in the calibration of masses and weighing devices. Jack began his involvement in this weighty field by working for the English balance manufacturer L.Oertling assembling and adjusting what he regards as proper balances ie. the two pan type. He then set sail and extended his experience and expertise in Australia by setting up perhaps the first public balance test facilities registered by NATA. He did this while working for Watson Victor Ltd., who were agents for Mettler and Oertling. Jack's knowledge of balances has already been put to use in the Metrology Society when he ran a technical session on balances at the last AGM in Melbourne.

Neville Owen has worked for the Gas and Fuel, Gas Technology Services for the last 20 years. In that time he has built up a multitude of experiences in the areas of very small pressure changes and gas pressure systems. He is a NATA signatory, NATA assessor and foundation member of the Metrology Society. He has been involved with a variety of projects in areas as diverse as portable precision temperature loggers, burn injury hazard monitoring, electrostatic gas ignition hazards and Quality System Certification of Gas Technology Services. Also, a long interest in standards, infrastructure and high precision measurement has lead to the development of an Australian standard prover for gas flow measurement. With original qualifications in physics he is also glad he did some studies in statistics to help reduce the uncertainties in his work to manageable proportions.

Graeme Smith is a metrologist with an impressive length and breadth of experience in various dimensional areas. Graeme's career started as an apprentice with the Commonwealth Ordnance Factory in Maribyrnong. He then worked as a toolmaker with Arthur Murray & Sons before moving to the metrology and gauge control section at the Commonwealth Ammunition Factory in Footscray, which later became Australian Defence Industries (ADI). Here he was involved in a wide variety of areas including using and calibrating high precision length and angle measuring equipment, developing test procedures and training other staff. After having worked there for a mere 32 years he decided to move on, and is now using his significant measuring and computing expertise at ACM Laboratory, which is a lot closer to home and his golf club. Graeme's projects at ACM have included developing computer programs to automate a variety of calibration procedures. As well as being a NATA signatory for many years both with ADI and ACM Laboratory, Graeme is also a NATA assessor.

1997 Subscriptions due now

Members are reminded that subs for this year are now overdue.

There are a number of members who have forgotten to renew their membership, so, if you haven't yet paid please get that cheque book out and forward your payment to our secretary Colin Wagg as soon as possible.

MSA97 Conference

The MSA biennial conference is now only 6 months away, and all metrologists wishing to attend should be starting to plan for it. Time to get out those planners and put a big circle around November 26 to 28.

Many good abstracts for talks and posters have been submitted, ranging over such diverse topics as flow metering, temperature, radiometry, electrical and dimensional standards, traceability, conformance to specifications and uncertainty and others; and focussing on techniques, hardware, systems, methods, training and latest developments in technology and fundamental standards.

Keynote speakers Dr. Thomas Hutteman, Director of global Corporate Metrology for Kodak (US), Prof. Volkmar Kose, Vice President of the PTB - Germany, and Dr. Barry Inglis, Director of Australia's NML and current Regional Coordinator of the Asia Pacific Metrology Programme), promise to present to the conference a wide ranging and in-depth view of metrology now and as it moves forward into the future. The focus will be on the interdependent roles of industry, the global market and the national, regional and international standards and metrology infrastructure - Metrology, where it counts.

Visits are being organised to some of Melbourne's most significant metrology centres, particularly in production and industry, calibration and metrology service providers and energy utilities. A number of exhibitions and trade displays are planned from some of the major suppliers of metrology equipment and services. Our sponsors who are generously supporting our conference to date are Bellinger Instruments, ADI Limited / Technology Group, CSIRO-National Measurement Laboratory, National Standards Commission, Australian Calibrating Services (Group of Companies), Transfield, CAL LAB Magazine, with others expected. We expect to have the final conference brochure with full details ready for mail out with the next issue of TAM.

Building on the very successful first conference, we are all looking forward to MSA97 as another step forward for our society and Australian metrology, so come along and join your colleagues

from all around Australia and all (ie most) corners (ie surface land regions) of the globe.

MSA'97..... Melbourne in the Spring... too good to miss. See you there.

MSA97 organising committee.
<http://www.ozemail.com.au/~ausmet>

Metrology Society of Thailand

Did you know that there is a Metrology Society in Thailand? The MSA's new Web site (<http://www.ozemail.com.au/~ausmet>) has been very successful, attracting a number of international contacts, including Ms. Thawilwadee Bureekul, Secretary of the Metrology Society of Thailand (MST).

According to Ms Bureekul, the MST aims "*to carry out activities which encourage the development of metrology system of Thailand to be in accordance with universal standards. We are center for exchange knowledge and experience among metrologists in Thailand. Our society has been set up for 5 years and now have around 200 members.*"

The president of the MST is Dr. Wiboonkiet Moleeratanond. The MST is keen to establish formal links between the MSA and the MST and we will certainly be exploring this in the future. As part of this process, we are encouraging a group of metrologists from the MST to attend the MSA conference in November 1997.

So, if you are travelling in Thailand or you simply need to make some contact with metrologists in Thailand, contact Ms Thawilwadee Bureekul at:

Technology Development Office(TDO)
e-mail: tdopgc@ksc15.th.com
Premier Group of Companies(PGC)
thawip@mozart.inet.co.th
1 Soi Premier, Srinakarin Road
Prawet, Bangkok, Thailand 10260
tel 66-2-3011000
fax. 66-2-3011092

NEWS FROM THE STATES

NSW

Our first meeting to the Macleay Museum in Sydney University was well attended. Members really enjoyed the opportunity to have a private viewing of this historically important exhibition. Kater's letters, papers and equipment have been generously lent by his family. Julian Holland presented a most informative lecture which provided insight into Kater the man. This exhibition will be on for most of this year so if you are visiting Sydney be sure to drop in for peaceful interlude.

The RAAF base at Richmond is providing a venue to demonstrate their NDI testing facility on May 28. Plans are well underway for July 16 for an astronomy evening with a focus on metrology at the University of Western Sydney, Werrington Campus. This will start around 7.30 PM after a barbecue.

Medical measurements will be demonstrated at Westmead Hospital on October 14, from 5-7. October will be a busy month with an AGM for NSW in the end of the month. In mid November members will have an opportunity to revisit the very popular Sydney Airport this time to view aircraft operations. A visit to AGAL in August is yet to be confirmed. Please consider nominating to organise events for 1998 as we need your input to make the association work for you. Great ideas and nominations can be faxed to Marian Haire on (02) 9888 3033.

VICTORIA

Victorian members attended a technical evening and tour of the factory of Gauge maker S.G.Prittie Precision Gauges Pty. Ltd. during April.

The company manufactures precision gauges and is known throughout Australia for the quality products that have been produced since the business was started by Stan Prittie in 1947, this year being its' Golden Anniversary.

The guided tour and demonstration of the production facility was followed by a visit to the companies' NATA registered Metrology Laboratory. Specialised precision grinding and lapping of thread gauges etc. were demonstrated to the MSA members prior to the

laboratory tour where we witnessed the very well equipped length and angle facility.

An enlightening talk/discussion on the many blurred, ill-defined generalities on the interpretation of AS 1997 (Plain Limit Gauges) was presented by Alex Smart (General Manager) and proved to of a great benefit to attendees.

Alex should be proud of the work ethic and dedication showed by his staff during the evening.

The evening concluded with a most enjoyable supper and an indication of the success of the evening was evident when Alex had to forcibly evict members who were clamouring for more information and technical advice.

(Or was it for more supper Ed.)

The next technical evening for Victorian members will be a tour of the new test and calibration facility of **PowerNet** on: **Friday 18th July 1997**

Address: **308 Hyde Street, Yarraville**

Contact: **Ron McBain (03) 9852 0466**
(03) 9850 3919

by: **30 June '97**

On the Social Side:

Your social convenors would appreciate some input from members with respect to social activities.

If you have any ideas contact Ron McBain and we will attempt to implement them, as recent social events have only been moderately supported by members.

SOUTH AUSTRALIA

No information received.

QUEENSLAND

No information received

Come on State coordinators use TAM to notify members of what you are doing or planning. (Ed.)

Options for Addressing Measurement Issues in Australian Industry

A Sectorial Approach

Dr. Richard Brittain

National Standards Laboratory

Introduction

Following recent developments in the area of Australia's technical infrastructure, and in particular the Inquiry into Australia's Standards and Conformance Infrastructure¹ (the Kean inquiry), the National Standards Commission has been refocussing its activities in the area of national metrology policy into a strategic analysis of the national measurement system. As part of this approach the Commission is preparing an options paper for addressing measurement issues in Australian industry. This article is intended to inform both users and providers of industrial measurement in Australia of this activity with a view to the possibility of obtaining their input at a later stage.

Background - Economic Importance of Measurement

Studies of industrial measurement and related issues by the National Institute of Standards and Technology (NIST)² in the USA and The Organisation for Economic Cooperation and Development (OECD)³ in Europe have shown that, aggregated across all industry sectors, measurement related activities can contribute nearly four percent to the gross national product of an industrialised nation. Data from the Australia Bureau of Statistics *Year Book Australia 1997*⁴, indicates that Australia's average Gross Domestic Product (GDP) for 1995/96 was in excess M\$400,000! Further, it has been shown that under-investment in intangible areas such as the national measurement system, can actually impede innovation and growth as well as lowering productivity and competitiveness in industrialised nations⁵.

The Commission's Work on Industrial Measurements

The objectives of the Commission's activities in this area are:

To ensure that measurements made in Australian industry are of an appropriate nature and accuracy, and are traceable to the Australian primary standards of measurement, or a recognised international equivalent.

To promote a wide spread understanding of the economic importance of good measurement to Australian industry.

To optimise the economic returns to Australian industry from the existing measurement infrastructure and new measurement technologies.

To identify industry sectors where initiatives to promote and facilitate improved measurement will maximise economic returns.

Methodology

In order to identify which areas of Australian industry would benefit most from improved measurement the Commission proposes to consider Australian industry in terms of the Australian and New Zealand Standards Industrial Classification (ANZSIC), used by the Australian Bureau of Statistics (ABS)⁶. Using the ANZSIC classification, industries will be considered in terms of how measurement intensive they are, and what added value measurement provides in these industries.

The Commission further proposes to compare the support available to the various sectors of Australian industry with the support available to similar industry sectors in a number of other industrialised countries in order to indicate the likely effectiveness of the Commission in addressing the measurement issues in a particular sector.

Upon completion of the first draft of an options paper the Commission proposes to canvas outside opinion before proposing actual initiative(s) to address measurement issues in the identified industry sectors.

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Letter to the Editor

In the February issue of TAM it was with great elation that I finally saw in print the technical explanation / definition of a Metrologist.

I must say that after some 35 years plus in the field of dimensional metrology it is a great relief to find the words that can explain in detail what I have been doing over these years.

You have no idea how pleased my wife was when she read these wonderful meaningful words defining a metrologist. At long last she now realises what a wonderful and brilliant omnipotent genius who comes with great empirical knowledge (borrowed those words from Garry. Price's article) and technical skills she has spent many wonderful years with.

This definition now hangs near the telephone, so that when she is asked what Ron does for a crust. she can now gush forth with this grandiose definition of my chosen profession, at long last there is know need to explain that Ron is not responsible for the weather.

However, I must take exception to an important element which is missing in the definition, that being the area of statistics, because, after all, the first 90% of any R&R

study takes 90% of the time, the remaining 10% takes the other 90%.

Its no wonder that dimensional metrologists are made to measure go to any lengths, what's more if it wasn't for the last minute nothing would be done.

Prepared at the last minute for inclusion in TAM

Ron McBain (QCS)

NEW MEMBERS

We welcome the following people have been accepted into the MSA since the last publication of new members. (Issue 8 June 1996)

NSW

Bolenski	Dieter	M
Balakrishnan	Vasukan	A
Zeleny	Jana	M
White	Allan	M
Bell	Trevor	M
Dickinson	Laurence	M
Jiang	Xihu	M
McKinley	David	M

QLD

Williams	Noel	A
Smith	Trevor	M

SA

Wojcik	Matthew	A
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VIC

HuysingP	Paul	M
Alesi	Joseph	M
Tossel	Anthony	M
Salem	Sam	M
Ward	Adrian	M
Rabby	Luftur	M
Butler	Ian	M
Byers	Ricky	M

WA

Cole	Stephen	M
Dobson	Peter	M
Martin	Jeff	M

New Zealand

Kapoor	Lyndon	M
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(M = Member; A = Associate Member)

Membership as at May 1997

ACT 2;	NSW 102;	NT 4;
QLD 39;	SA 34;	TAS 6;
VIC 142;	WA 18;	Overseas 6;
Total	357	

Metrology Training - National Curriculum Project

Are you aware that you can improve the calibration skills of your employees by enrolling them in a TAFE course? The following Metrology modules were developed as part of a nationally accredited curriculum designed to address industry requirements. The modules and their associated assessment packages have been completed for some time. Sydney Institute of Technology and the Royal Melbourne Institute of Technology offer these modules.

Each module can be taken as an individual course or as part of a TAFE Engineering course. To date there does not appear to be a lot of customers for these courses. This article in TAM is to see if you, the customer, can shed any light on this great mystery. Is it that no one knows the courses are on? Could it be that they are not offered at the right time? Are they too expensive?

1. Do you or a colleague need any of this training?
2. Will your employer support you to attend these modules?
or if not: Are you willing to pay for these modules yourself?

Please circle the cost you think reflects the Value of ONE of these modules. Up to \$350 \$500 \$800 \$1000

3. Which of the following would make these modules more accessible to your workplace?
 - a/ Attend a TAFE college for the module selected.
 - b/ Arrange for a qualified TAFE teacher to present modules at my company / organisation at a fee for service.
 - c/ A qualified member of my staff become an accredited provider and deliver the selected modules in the workplace. I understand this would require a fee for accreditation as a provider.
 - d/ The modules were available in a distance education mode.
4. What other training do you need?

If you can help please fax answers to Marian Hare on (02) 9888 3922. Your input will be greatly appreciated and will allow us to provide better training for you. If you have completed one of these modules your feedback would also be most useful.

The metrology modules developed are as follows:

General Introduction for both strands

EA 775 Introduction to Metrology

EA 793 Force Measurement

EA 794 Gas Flow Measurement

EA 796 Liquid flow measurement

EA 799 Pressure Measurement

Electronic Calibration:

EA 782 Oscilloscope Calibration

EA 784 Auto Calibration and Controllable Instrumentation

EA 786 Calibration of Time and Frequency Standards

EA 789 Digital Fault Finding

EA 791 Electronic Counter Calibration

EA 795 Electrical Calibration Techniques

EA 798 Precision Electrical Measurements

If you require more detail on any of these modules please contact Marian Haire at NSC on Tel (02)9888 3922 or by Fax on (02) 9888 3033.

RF and Microwave:

EB 780 RF and Microwave Calibration

EB 781 RF and Microwave Measurement

EB 782 RF and Microwave Signal Sources

EB 783 Spectrum and Network Analysis

EB 784 RF and Microwave Transmission Lines

EB 787 Co-axial and Waveguide Equipment

OIML IR 76 - Train the Trainer Module

The National Standards Commission is currently coordinating a training package on OIML IR 76 *Testing procedures for pattern approval of non automatic weighing instruments*. The module will consist of a trainers manual, a procedures manual, student exercises, evaluation report sheets and a video to show the test procedure. The training module will be presented for the first time at the Asia Pacific Legal Metrology Forum (APLMF) forum in Japan in October 1997. This module has developed from a joint Australia China measurement skills project. Participating economies will be able to develop similar capabilities within their staff involved in pattern approval. It will also provide opportunities to discuss points that require clarification. The project is an exciting first step in working towards harmonising the testing procedure for non-automatic weighing instruments within the region

Dimensional Metrology:

EA 710 Dimensional Metrology - Basic

EA 773 Dimensional Metrology - Measuring and Testing

EB 785 Dimensional Metrology - Advanced Techniques

EB 786 Dimensional Metrology - Complex Forms Measurement

EB 788 Co-ordinate Measuring Machine Technology

EB 789 Laser Technology in Dimensional Metrology

Instrument and Process Control

EA 771 Temperature Measurement

EA 774 Hardness Measurement

EA 781 Acoustics: Instrumentation & Measurement

EA 792 Introduction to Flow Measurement

THE AUSTRALIAN METROLOGIST

EMPLOYMENT AVAILABLE FOR METROLOGISTS

This section is offered by the Metrology Society as a service to members. The advertisements are as submitted by the Personnel Organisation and any claims regarding the positions are not those of the Metrology Society of Australia

Please contact the respective Personnel Organisations if you wish to pursue the issue further.

PRECISION MACHINE TOOL FITTERS

- High Performance Company
- High Earnings Potential
- Clean / Non-Noisy Environment
- Eastern Suburbs

The company requires people who are patient, tolerant--able to plan things, quick witted, and able to work without close supervision.

This leading, multi award winning Australian Enterprise has opportunities for a number of Precision Machine Tool Fitters. You will be working in a "State-of-the-Art" environment with a dedicated team. You will be reporting to an approachable Production Supervisor. You will be required to build precision machines from the ground up (no production lines here)..... from a fully tooled fitting bay you will be working from complex drawings and using precision measuring instruments.

Appropriate experience may include: gearbox, spindle motor assembly environment...Metrology and/or ISO 9000 quality experience will be well regarded. Good communication skills (reading, writing, comprehension) and the ability to follow complex drawings is essential.

To further discuss these opportunities contact:

John Jago of "BEVAN TURNER GROUP"

Phone: (03) 9347 6888 Fax: (03) 9347 6466

or send your details to

PO Box 1212 Carlton Vic 3053

CALIBRATION TECHNICIAN

(This position is located in South Australia)

An organisation is seeking a calibration technician to be responsible for,

- Calibration
- Maintenance
- Repair

of test equipment with the principal accountabilities being:

Certify, diagnose and repair test equipment

Receive and dispatch all maintenance items of Testing, Measuring Diagnostic Equipment (TDME) and assist in master inventory of TDME.

Assist in the development of local calibration procedures as required to meet requirements of new or peculiar TDME.

Train, on new equipment and new procedures.

Assist with random verification inspections on items calibrated to ensure correct adherence to authorised calibration and maintenance procedures.

Assist in the determination of manpower and equipment requirements for current and future programs.

The successful applicant would be responsible for the work required to align, inspect, troubleshoot, overhaul and calibrate TMDE using advanced principles of metrology and technical maintenance practices.

He or she should:

- hold an industry accepted tertiary course certificate concentrating on principles of metrology (either from a military source or an accredited technical institute.
- Have at least 2 years experience in a metrology environment with that experience concentrated in Waveform measurement.

For further details contact:

Greg Young of "QUEST PERSONNEL"

Phone: (03) 9415 8711 Fax: (03) 9415 8733

or send your details to

PO Box 1272 COLLINGWOOD VIC 3066

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 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:

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The deadline for the next issue is **20th July 1997**

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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 \$400 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.

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