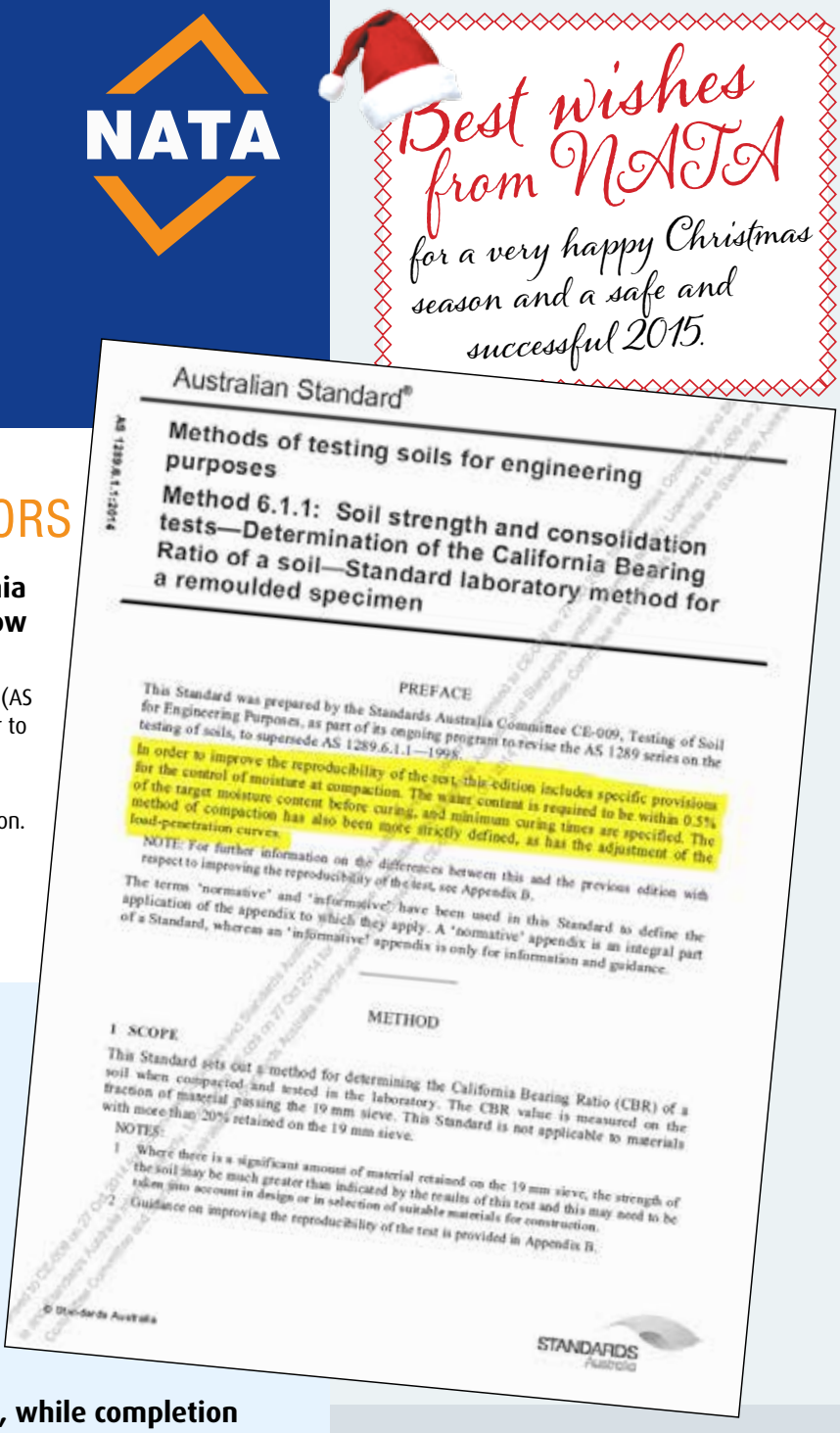
ISSUE SIX | DECEMBER 2014

NATA

TECHNICAL ASSESSORS' NEWS



FOR CMT TECHNICAL ASSESSORS

The updated Australian Standard for the California Bearing Ratio (as shown in the illustration) is now available.

Please note the highlighted text from the preface of this standard (AS 1289.6.1.1) which relates to the significant changes made in order to improve the reproducibility of the test:

"In order to improve the reproducibility of the test, this edition includes specific provisions for the control of moisture at compaction. The water content is required to be within 0.5% of the target moisture content before curing, and minimum curing times are specified. The method of compaction has also been more strictly defined, as has the adjustment of the load-penetration curves."

FOR NDT TECHNICAL ASSESSORS

USE OF ASSESSOR RECORD SHEET AND TECHNICAL ASSESSOR WORKSHEET

Two separate assessor records are used by Technical Assessors in Non-destructive Testing assessments - the Assessor Record Sheet and the Technical Assessor Worksheet.
The Technical Assessor Worksheet is NDT-specific, while completion of the Assessor Record Sheet is a NATA Corporate requirement.

- The Technical Assessor Worksheet should be used to record notes and details, with the important points being transferred to the Assessor Record Sheet.
- The Assessor Record Sheet is used to record the main findings of the assessment.
- Both sheets are retained in the job file for the assessment and are available for any subsequent review that may be necessary.

With the emphasis on assessment of Level 3 involvement in technical control of NDT operations it is necessary to use the Technical Assessor Worksheet to record details of these discussions. Part 1 of the worksheet is used to record these. The purpose of discussion with the Company's Level 3 or the senior technical controller at the site is to obtain an understanding of the company's approach to work acceptance, method selection and development, testing capability assessment, and competency assessment and authorization of testing personnel.

Part 2 is used to record information regarding the implementation of procedures for each of the main NDT methods - ultrasonics, radiography, magnetic particle testing, penetrant testing and electromagnetic testing. This encompasses Technician involvement, covering details such as equipment, procedures, job files, test records recording and reports.

Part 3 covers site visits and test method demonstration. The vast majority of commercial NDT is carried out on-site. Technical assessments for commercial testing companies normally involve a visit to a client work site to witness on-the-job testing. Witnessing testing in field conditions offers advantages in terms of assessing in-situ challenges to testing technicians and in appreciating the potential variety of test items that may be encountered. An assessment which is restricted to the base facility only is unlikely to cover the implementation of procedures as comprehensively as one involving site visitation.

IN THIS ISSUE:

Horst Winfried Sieker

1952 - 2014

It is sad to report the death of Horst Sieker on 8 May this year at the age of 62. He made countless contributions over many years to NATA, to the Metrology Society of Australia (MSA) and to measurement science in general.

Horst managed and owned ACM Laboratory (ACML), a dimensional metrology calibration laboratory in Melbourne. Academically, he held a Master of Engineering Science degree in Mechanical Engineering and was a member of the Institute of Engineers Australia.

His considerable expertise ranged across the whole spectrum of dimensional and engineering metrology, quality control and management. He became a NATA Technical Assessor in 1999, was invited to join the Physical and Dimensional Metrology Accreditation Advisory Committee in 2000 and then the Calibration Accreditation Advisory Committee. He was a member and adviser on many Standards Australia committees.

Horst was a founding member of the MSA and served on the Society's national committee from its beginning in 1993 to 1996.
Horst immediately recognised the ideals and value of the MSA and worked tirelessly on the committee to promote metrology in the community, to bring metrologists together to exchange skills and knowledge and to raise the professional status of metrologists.

His common sense and practical experience in running a private metrology laboratory were invaluable.

The high-level work Horst did for NATA and the MSA was both significant and important for Australia, helping to guarantee the accuracy and integrity of dimensional measurements and lifting the quality and professionalism of our metrologists. It's important to remember that he gave the many hours of work required voluntarily, while at the same time trying to run a complex small business in a very competitive marketplace.

Horst will be remembered as a very clever and innovative metrologist who was always willing to share his knowledge and insights.

Throughout his time at ACML, he remained a truly hands-on metrologist, flying all over Australia to ply his skills. He designed much of the precise air conditioning system in the ACML Moorabin laboratory, including setting up a solar collector in 1998 that stored the energy in a large water tank with a pump to send the heated water into the laboratory.

He was crowned the metrologist of the year by the MSA for his development, along with Graeme Smith, of a new gauge block calibration system using laser interferometry.

Horst will be deeply missed by the Australian metrology community and especially by all his many friends in NATA and the MSA.

DOM'S WEBINAR A BIG HIT

Dom in his Abbotsford webcasting studio

When CMT wanted to provide their Technical Assessors with information on the assessing of the control of various elements of a laboratory's management system they decided to use a webinar.

CMT stalwart Dom Meadley prepared a webinar for his colleagues that tested the Assessor's knowledge of what is required to have suitable control of areas such as equipment assurance, proficiency testing, quality assurance and comparison tests.

This was done by polling the participants and then giving feedback on each scenario.

Dom ran two webinars in September and the feedback was very positive, so he now has other topics in the pipeline. If you missed the September webinar, there will be a new one in February 2015.

CMT Technical Assessors will be advised of a date and time for the next webinar.

Tony Bergen, Technical Director at Photometric Solutions International in Huntingdale, Victoria, spotted this on the front cover of the Melbourne Age and thought his colleagues might be interested in the paper's new take on "calibration".

Thanks for the clipping Tony. Maybe some of our other readers can spot similar 'technical errors' in their local papers and send them in to share with TA News.

Blowin' in the wind, not

Once a year maintenance workers scale the Tullamarine Freeway "zipper" to recalibrate the weight of the large structures, to keep them still in the wind. Yesterday was the day.

TECHNICAL ASSESSOR NAMED SENIOR MANAGER FOR GLI AUSTRALIA

Phil Harrison, a NATA Technical Assessor since 2004, has been named Senior Manager Regulator Development, Compliance & Quality Assurance for GLI Australia.

He will be based in the company's Adelaide laboratory and will work closely with regulators and clients throughout GLI's Australian and Asian marketplaces.

Phil's extensive experience in the gaming industry dates back to 1994 when gaming machines were first introduced to South Australia.

In his role as inspector, systems auditor and as Manager of Gambling Operations for the Office of the South Australia Liquor & Gambling Commissioner, Harrison has worked with all of the major stakeholders throughout Australia and Asia, including regulators, manufacturers, gambling operators, ATFs and monitoring system operators.

After 16 years with the Office of the South Australia Liquor & Gambling Commissioner, he recently served as Executive Officer and Director of Club Safe, an initiative of the club industry to support clubs with gaming and promote responsible gambling.

For nearly 10 years, Harrison chaired the Australian/New Zealand Working Party on Gaming Machine National Standards and the Assessment Panel for the Accreditation of Testing Facilities (ATFs).

With 21 laboratory locations spread across Africa, Asia, Australia, the Caribbean, Europe, North America and South America, GLI is the only global organization of its kind to hold U.S. and international accreditations for compliance with ISO/IEC 17025, 17020, and 17065 standards for technical competence in the gaming, wagering and lottery industries.

Phil Harrison

SNAKES ON AN ASSESSMENT

Technical Assessor Brett Hughes recently conducted an assessment of a Cardno lab on the Sunshine Coast with NATA's Kylie Campbell.

The assessment had been going on for a while and was getting close to the end when Brett and a couple of the lab's technicians started hearing some banging sounds coming from the mezzanine above the kitchen of the site lab building.

Using some chairs and a desk to have a closer look, they discovered two carpet pythons having a bit of a disagreement. At first they thought the pair was a male and female enjoying each other's company, but when the fauna handler turned up she informed the team of what was actually going on.

The fighting pair turned out to be two males having an argument over something only they knew about. During the fighting one of them even fell off the mezzanine and landed on the desk in the room where the assessment team was waiting. The larger of the snakes was easily two metres long.

Fortunately Brett grabbed his camera and took some photos of the snakes while they were at it.

A cuddly start

Mine's longer

Loose in the office

Knotty problems

NATA OFFICE CLOSURES OVER CHRISTMAS AND NEW YEAR

NATA's offices will be closing during the Christmas - New Year period. All offices will close officially at 3.00 pm on Wednesday, 24 December 2014 and re-open on Monday, 5 January 2015.

RECOGNISED-VALUE STANDARDS AND THEIR ROLE IN ACHIEVING LEGAL TRACEABILITY IN NATA ACCREDITED FACILITIES

Previously in *NATA Technical Assessors News*[1] the key features of legal traceability were identified and explained. Its relationship to metrological traceability[2], when it is necessary, and its place and role in NATA accredited facilities were outlined. Means of achieving legal traceability were also considered.

The ***recognised-value standards of measurement***[3] referred to in that article are one of the specific means of achieving legal traceability amongst the multiple legal traceability pathways provided in the National Measurement Act 1960 (Cth)[4]. They are a means of achieving legal traceability[5] and satisfying the traceability requirements of AS ISO/IEC 17025[6] in NATA accredited facilities requiring legal traceability in their work.

This paper provides further details of ***recognised-value standards of measurement*** and their role in achieving legal traceability in NATA accredited facilities. It also discusses the National Measurement Institute's (NMI) review of the current suite of recognised-value standards of measurement and invites NATA stakeholders to provide comment on, and input to, this review.

What is a recognised-value standard of measurement?

The definition of a ***recognised-value standard of measurement***[7] is given in the National Measurement Act 1960 (Cth) as: ***recognised-value standard of measurement*** means a standard of measurement that the Chief Metrologist has, under section 8A, determined shall be a recognised-value standard of measurement'.

standard of measurement[8] means:

1. a material measure, measuring instrument or measuring system designed or intended to define, realise, conserve or reproduce:

   (i) a unit of measurement of a physical quantity; or

   (ii) one or more known values of a physical quantity;

   in order to transmit that unit of those values to measuring instruments by way of comparison; or

2. a formula designed or intended to define the magnitude of a physical quantity.

Chief Metrologist[9] refers to the NMI's Chief Metrologist.

The powers of the Chief Metrologist with respect to ***recognised-value standards of measurement*** include not only the power to determine them[10] but also to revoke or vary[11] such determinations. In addition ***recognised-value standards of measurement*** as determined by the Chief Metrologist are not subject to verification thus:

8A Recognisedvalue standards of measurement[12]

(1) The Chief Metrologist may, by legislative instrument, determine that:

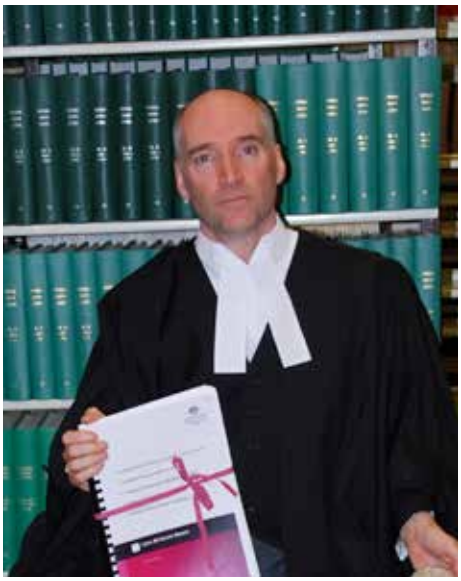
(a) magnitudes of physical quantities specified in the determination; or

(b) magnitudes of physical quantities as ascertained in accordance with a formula set out in the determination; shall be recognised value standards of measurement

(2) The Chief Metrologist may revoke or vary any such determination.

(4) A recognisedvalue standard of measurement is not subject to verification.

Therefore a ***recognised-value standard of measurement*** is a ***standard of measurement*** to which a particular value (or values) has(have) been assigned without that value necessarily being determined by verification and irrespective of whether that value is in fact the true or accurate value. The concept of ***recognised-value standards of measurement*** is peculiar to legal metrology and may well sound like scientific heresy to many scientists. However, there are good reasons for having ***recognised-value standards of measurement*** and they form an important part of the nexus between science and law that is facilitated by legal metrology. In particular ***recognised-value standards of measurement*** are an important means for achieving legal traceability.



Dr Richard Brittain LLB

The determination of a ***recognised-value standard of measurement*** is by legislative instrument i.e. they must be determined in writing, be of a legislative character and made in the exercise of a delegated power[13]. In this case a power delegated to the Chief Metrologist by the Australian Parliament acting through the *National Measurement Act 1960* (Cth)[14].

As legislative instruments that '... determine the law or alter the contents of the law...'[15] ***recognised-value standards of measurement*** must be registered on the Federal Register of Legislative Instruments[16] and are subject to the sun setting provisions associated with the *Legislative Instruments Act 2003* (Cth) and its regulations[17].

The relevance of recognised-value standards of measurement to NATA accredited facilities

When the provisions of section 10 of the *National Measurement Act 1960* (Cth) are enlivened; i.e. measurement(s) of a physical quantity, for which there are Australian legal units of measurement, are made for a legal purpose, and the necessity to show that they have been made in terms of Australian legal units of measurement arises, five of the eleven options for demonstrating that they have been made in terms of Australian legal units of measurement (i.e. achieving and demonstrating legal traceability) use ***recognised-value standards of measurement***. These options are 'by means of, by reference to, by comparison with or by derivation from'[18]:

1. An appropriate ***recognised-value standard of measurement***[19];
2. Two or more of the standards of measurement detailed in section 10 of the *National Measurement Act 1960* (Cth) one of which is a ***recognised-value standard of measurement***[20];
3. An ***Australian certified reference material*** and one or more of the ***standards of measurement*** detailed in section 10 of the *National Measurement Act 1960* (Cth) including recognised-value standards of measurement[21];
4. A certified measuring instrument and one or more of the standards of measurement detailed in section 10 of the *National Measurement Act 1960* (Cth) including ***recognised-value standards of measurement***[22];
5. An ***Australian certified reference material*** and a ***certified measuring instrument*** and one or more of the ***standards of measurement*** detailed in section 10 of the *National Measurement Act 1960* (Cth) including recognised-value standards of measurement[23].

This demonstrates the key role of ***recognised-value standards of measurement*** in achieving legal traceability in NATA accredited facilities (when it is necessary). They effectively set or fix the magnitude of a physical quantity realised and promulgated through ***recognised-value standards of measurement*** for legal purposes – even if it may not be quite right i.e. true and accurate. This is useful primarily for legal rather than technical purposes.

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RECOGNISED-VALUE STANDARDS AND THEIR ROLE IN ACHIEVING LEGAL TRACEABILITY IN NATA ACCREDITED FACILITIES (cont)

The current suite of recognised-value standards of measurement

As at the time of this article there are eight ***recognised-value standards of measurement*** that have been determined under the National Measurement Act 1960 (Cth)[24]. These are:

1. **Australian Fiducial Network Locations** – this determines the twenty-one positions in the Australian Fiducial Network to be recognised-value standard or measurement of position in the Geodetic Reference System 1980 (GRS80) reference ellipsoid and the Geocentric Datum of Australia reference frame determined within the International Earth Rotation Service Reference Frame 1992 (ITRF1992) at epoch 1994.0.
2. **Acceleration due to Gravity** (in NMI room B245) – this determines that the magnitude of the acceleration in vacuo of a body due to the gravitational attraction of the earth at any point on the floor of room B245, of what is now the NMI, to have a single specified value.
3. **Density of Water** – this determined that the magnitude of the density of water over the temperature range 0 °C to 40°C and pressure range 2×10^4 to 10^6 Pa is as per the table of temperature and pressure provided in its schedule. It also provides means for interpolating between the values given in the table and making adjustment for atmospheric pressures other than 101 325 Pa (the reference pressure). A statement of uncertainty for the determined densities is also specified.
4. **Acceleration due to Gravity** (generally) - this determines that the magnitude of the acceleration in vacuo of a body due to the gravitational attraction of the earth shall be, at the locations specified in the Bureau of Mineral Resources Geology and Geophysics report 207 *Australian Gravity Network Adjustment 1975* as per the values stated in that report multiplied by a factor. A statement of uncertainty for these determined accelerations is also specified.
5. **Density of Mercury** – this determines that the magnitude of the density of mercury over the temperature range 0 °C to 40°C and pressure range 0 to 10^7 Pa is as per the table of temperature and pressure provided in its schedule. It also provides means for interpolating between the values given in the table and making adjustment for atmospheric pressures other than 101 325 Pa (the reference pressure). A statement of uncertainty for the determined densities is also specified.
6. **Density of Standard Mean Ocean Water** – this determines that the magnitude of the density of standard mean ocean water at a reference temperature (3.99 °C) and pressure (101 325 Pa) to be 999.975 kg/m^3. Mean ocean water is defined as being water that is pure, free from dissolved gas and with specified isotopic ratios for the oxygen and hydrogen atoms from which the water is composed.
7. **Velocity of Electromagnetic Waves in a Vacuum** – this determines that the magnitude of this velocity is 299 792 458 m/s (as per resolution 2 of the 15th BIPM General Conference of Weights and Measures(CGPM), *Recommended value for the speed of light*).
8. **Dynamic Viscosity of Water at a Temperature in the Range 19.98 °C to 20.92 °C** – this determines that the magnitude of the dynamic viscosity of water, in this temperature range and prepared as per the schedule to the determination has the determined value (0.001 002 Pa.s).

NMI review of recognised-value standards of measurement

NMI is presently reviewing the current suite of ***recognised-value standards of measurement***. Most of these were determined by the former National Standards Commission in 1985 and continued in existence under the transitions provisions of the legislation that created the NMI[25]. Some of these ***recognised-value standards of measurement*** contain a statement of uncertainty for the value(s) determined, however, these statements are not compliant with the current Guide to the expression of uncertain in measurement[26].

The vast majority of the current suite of ***recognised-value standards of measurement*** have a review date of 1 April 2019 under the Commonwealth legislative instruments legislation[27] and will need to be re-registered in either their current or a revised form from that date if they are to continue in effect.

NMI's review will consider:

1) Whether the ***recognised-value standards of measurement*** in the current suite are still appropriate;
2) For the ***recognised-value standards of measurement*** retained following the review what their value(s) should be; and
3) What (if any) additional r***ecognised-value standards of measurement*** are desirable to support the national measurement and legal metrology system(s).

This review is an opportunity for NATA stakeholders to comment on, and/or make input to, this review and NMI would welcome such inputs[28]. Following the review a revised suite of ***recognised-value standards of measurement*** will be determined and registered on the Federal Register of Legislative Instruments[29]. These determinations, will be made under the auspices of the NMI's Chief Metrologist and be in the current drafting style for such determinations. Any uncertainties in the revised suite of recognised-value standards of measurement will be compliant with the requirements of the current *Guide to the expression of uncertainty in measurement*[30].

Details of the revised suite of ***recognised-value standards of measurement*** will be promulgated to stakeholders through the NMI website[31] and appropriate NATA publications inter alia when the review has been completed.

Conclusion

Recognised-value standards of measurement are standards of measurement that have been assigned a value by NMI's Chief Metrologist.

They are not subject to verification and the value(s) assigned to them may not be totally true or accurate. However, the assigned

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ON-LINE TADP AMENDMENTS

NATA's Professional Development Manager, John Widdowson has advised that the on-line TADP content has been amended and the LearningSeat course is now available for use.

Technical Assessors in remote locations who require assessor training should contact their Client Coordinator who can request their registration into the on-line TADP.

The Training Services Group will seek approval for the training to be undertaken and can provide the Technical Assessor with the relevant information to access the on-line training.

RECOGNISED-VALUE STANDARDS AND THEIR ROLE IN ACHIEVING LEGAL TRACEABILITY IN NATA ACCREDITED FACILITIES (cont)

value(s) have standing at law and on that basis are useful for promoting uniformity, consistency and comparability between measurements made for legal purposes by providing common reference point(s) for such measurements.

Recognised-value standards of measurement either in their own right, or in combination with other standards[32], certified measure instruments and/or Australian certified reference materials, are amongst the key options for achieving legal traceability under section 10 of the *National Measurements Act 1960* (Cth).

NMI is reviewing the current suite of ***recognised-value standards of measurement*** to ensure that it continues to serve the current, and as far as is predictable, the future needs of the national measurement and legal metrology system(s). Comments and inputs on this review are welcomed from NATA stakeholders[33]. Details of the revised suite of ***recognised-value standards of measurement*** will be promulgated to stakeholders through the NMI website[34] and appropriate NATA publications.

The author of this article, Dr Richard Brittain LLB, can be contacted via his National Measurement Institute email: Richard.Brittain@measurement.gov.au

1 Legal Traceability – the Frequently Asked Questions NATA Technical Assessors News issues 4, November 2013.
2 BIPM JCGM 200:2012 International vocabulary of metrology – Basic and general concepts and associated terms (VIM) 3rd edition clause 2.41.
3 National Measurement Act 1960 (Cth) s 3(1) definition of 'reference standard of measurement'.
4 National Measurement Act 1960 (Cth) s 10.
5 National Measurement Act 1960 (Cth) s 10.
6 AS ISO/IEC 17025 – 2005 General requirements for the competence of testing and calibration laboratories clause 5.6.3.1.
7 National Measurement Act 1960 (Cth) s3(1) (definition of 'recognized-value standard').
8 National Measurement Act 1960 (Cth) s3(1) (definition of 'standard of measurement').
9 National Measurement Act 1960 (Cth) s3(1) (definition of 'Chief Metrologist').
10 National Measurement Act 1960 (Cth) s8A(1).
11 National Measurement Act 1960 (Cth) s8A(2).
12 National Measurement Act 1960 (Cth) s8A.
13 Legislative Instruments Act 2003 (Cth) s5.
14 National Measurement Act 1960 (Cth) s8A.
15 Legislative Instruments Act 2003 (Cth) s5(2)(a).
16 ComLaw website, Federal Register of legislative Instruments <http://www.comlaw.gov.au/Content/Lawmakers>.
17 Legislative Instruments Regulations 2004 (Cth)
18 National Measurement Act 1960 (Cth) s10,
19 National Measurement Act 1960 (Cth) s10(d).
20 National Measurement Act 1960 (Cth) s10(f).
21 National Measurement Act 1960 (Cth) s10(i).
22 National Measurement Act 1960 (Cth) s10(j).
23 National Measurement Act 1960 (Cth) s10(k).
24 National Measurement Act 1960 (Cth).
25 National Measurement Amendment Act 2004 (Cth) s 8A.
26 Evaluation of measurement data – Guide to the expression of uncertainty in measurement JCGM 100:2008.
27 Legislative Instruments Act 2003 (Cth); Legislative Instruments Regulations 2004 (Cth).
28 Please e-mail to Richard.Brittain@measurement.gov.au.
29 ComLaw website, Federal Register of legislative Instruments <www.comlaw.gov.au/Content/Lawmakers>.
30 Evaluation of measurement data – Guide to the expression of uncertainty in measurement JCGM 100:2008.
31 NMI website <www.measurement.gov.au>.
32 Australian primary standards of measurement, Australian secondary standards of measurement and reference standards of measurement as defined in National Measurement Act 1960 (Cth) s3(1).
33 Please e-mail to Richard.Brittain@measurement.gov.au.
34 NMI website <www.measurement.gov.au>.

That's Ian in the front row in the blue T-shirt (second from right)

OUT OF THE LAB AND ONTO THE PITCH

Ian Pritchard, a NATA Technical Assessor in Veterinary Testing since 2004, plays on a team that recently won the National Senior Cricket Championships, held in Dandenong 9-14 November.

Ian's team was in the Victorian Country 1 Team in Division 1. The competition involved over 330 senior cricketers (including former Australian International players Bob Holland, Geoff Dymock, Graham Yallop and Ewan Chatfield) from 30 teams, playing in four divisions.

Ian also plays on the International level with the Australian Seniors team and was in the Australian over 60's Team that toured the UK in 2012.