Appendix A
National Type Evaluation Technical Committee (NTETC)
Grain Analyzer Sector

August 19 - 20, 2009, Kansas City, Missouri
Meeting Summary

Agenda Items

1. Report on the 2009 NCWM Interim and Annual Meetings

The Interim Meeting of the 94th National Conference on Weights and Measures (NCWM) was held January 11 - 14, 2009, in Daytona Beach, Florida. At that meeting the National Type Evaluation Program (NTEP) Committee accepted the Sector's recommended amendments and changes to the 2008 Edition of NCWM Publication 14. These changes appear in the 2009 Edition of Publication 14. For additional background, refer to *Committee Reports for the* 94th *Annual Meeting*, NCWM Publication 16.

Changes to the Grain Moisture Meter and Near Infrared Grain Analyzers 2009 Edition of NCWM Publication 14			
Section Number	**Amendment/Change**	**Page**	**Source**
IV. Tolerances for Calibration Performance	Delete the portion of §IV specifying the categories of calibrations to be listed on a Certificate of Conformance (CC).	GMM-6 and GMM-7	08/08 GMM Sector Agenda Item 10
VII.B. Accuracy, Precision, and Reproducibility	Amend to address multi-class type evaluations for TW.	GMM-11 through GMM-15	08/08 GMM Sector Agenda Item 7
VII.C. Tolerances for Test Weight per Bushel Calibration Performance	Amend to limit the moisture content of samples used in evaluating TW performance and to add special considerations for multi-class calibrations.	GMM-15	08/08 GMM Sector Agenda Item 8
Appendix C	Amend to add additional data fields for TW data and to update instructions for submitting data to reflect current practice.	GMM-41	08/08 GMM Sector Agenda Item 9

No Grain Moisture Meter (GMM) or Near Infrared (NIR) Grain Analyzer items appeared in the Specifications and Tolerances (S&T) Committee Interim Report for consideration by the NCWM at the 2009 Annual Meeting held July 12 - 16, 2009, in San Antonio, Texas. Mr. Jim Truex, NTEP Administrator, reported that Annual Meeting attendance was down this year, but that 35 states were represented exceeding the quorum requirements of 27. Other General Code items of interest to the Sector were non-voting items related to software and provisions for sealing electronic adjustable components. [See Sector Agenda Items 4, 4a, 4b, 4c, 4.d, 4.e and 9.]

2. Report on NTEP Type Evaluations and OCP (Phase II) Testing

Ms. Cathy Brenner of the Grain Inspection, Packers and Stockyards Administration (GIPSA), the NTEP Participating Laboratory for Grain Analyzers, briefed the Sector on NTEP Type Evaluation activity. Evaluations are currently underway for three additional devices: one new grain moisture meter with test weight capability; one new grain moisture meter; and one test weight per bushel add-on to a currently approved grain moisture meter. Annual GMM calibration reviews were completed on schedule and updated Certificates of Conformance (CCs) were issued for six device types. She reported that the following five device types are enrolled in the OCP (Phase II) for the 2009 harvest:

[Note: Models listed on a single line are considered to be of the same "type."]

Bruins Instruments	OmegAnalyzerG
DICKEY-john Corporation	GAC2000 NTEP, GAC2100, GAC2100a, GAC2100b
Foss North America	Infratec 1241
Perten Instruments	AM5100
The Steinlite Corporation	SL95

[Note: Foss Infratec 1227 & 1229 dropped out of Phase II – CC expires June 30, 2010.]

3. Review of Ongoing Calibration Program (Phase II) Performance Data

At the Sector's August 2005 meeting, it was agreed that comparative OCP data identifying the Official Meter and listing the average bias for each NTEP meter type should be available for annual review by the Sector. Accordingly, Ms. Brenner, representing GIPSA, the NTEP Participating Laboratory for Grain Analyzers, presented data showing

the performance of NTEP meters compared to the air oven. This data is based on the last three crop years, 2006 - 2008 using calibrations updated for use during the 2009 harvest season.

Four meter types were included in the comparison graphs: DICKEY-john's GAC2100; Foss's Infratec 1241; Foss's Infratec 1229; and Steinlite's SL95. Only the GAC2100 has been identified on the comparisons. It is identified as "Official Meter." The remaining three instruments were randomly assigned numbers 1, 2, and 3.

Ms. Brenner pointed out that data on Perten's AM5100 was not included in the comparisons because it has not been in the program for three full years. It will be included next year. Comparisons of GMMs with less than three years of data against GMMs with the full three years of data are not meaningful, as they may be unduly influenced by a single unusual crop year. Also, to preserve confidentiality, sunflower results were not included because only two meters were approved for sunflowers, one of which was the Official Meter. She noted that labels are missing on the moisture axis of the comparison graph for Hard White Wheat. The moisture intervals and number of samples for Hard White Wheat should be as follows:

8 % to 10 %	43 samples
10 % to 12 %	20 samples
12 % to 14 %	9 samples

[Note: The 2006 - 2008 GMM Phase II comparison graphs were distributed with the August 2009 Grain Analyzer Sector Agenda. They can also be downloaded from the NCWM website using the following link: http://www.ncwm.net/ntep/pdf/09_GMMBiases.pdf.]

Dr. Richard Pierce explained that GIPSA was considering changes in sample collection procedures, this year and in the future, to make moisture data somewhat more representative with respect to both geographical and moisture-range distribution. To illustrate the problem that present procedures have created, he offered an example involving soybean samples. Sample collection assignments are communicated to GIPSA field offices in the spring of each year through a sample collection notice. In the past, GIPSA has requested soybean samples in moisture ranges of 10 % to 13 % and 13 % to 16 %. Within these ranges, they typically receive large quantities of 12 % to 13 % and 13 % to 14 % samples, which results in a huge number of samples in the 12 % to 14 % range. To avoid this unintended consequence, GIPSA intends to request samples in moisture intervals matching those used in reporting Phase II data. They will also try to limit the number of samples that will be analyzed in each 2 % moisture interval.

Dr. Pierce noted that while having too many samples is not a problem for many of the moisture intervals, but GIPSA is trying to scale back so that they don't have more than 25 to 40 samples in a given 2 % interval per year. They will also be attempting to achieve better geographical balance that, as much as reasonably possible, is proportional to crops grown in an area. His message was, "We're not going to analyze every sample we receive."

4. Software Requirements That May Impact Grain Analyzers

Background: In October 2008 the International Committee of Legal Metrology (CIML) approved the new OIML document **D 31** ***General requirements for software-controlled measuring instruments*** that is intended to serve as guidance for software requirements in international recommendations under development by OIML technical committees. **Document D 31** can be downloaded free of charge from:

http://www.oiml.org/publications/D/D031-e08.pdf

In 2005 the NCWM Board of Directors established an NTETC Software Sector. One of the tasks assigned to the Sector was to develop a clear understanding of the use of software in today's weighing and measuring instruments. A good overview of the work of the Software Sector is contained in the Meeting Summary of the Sector's Annual Meeting held March 11 - 12, 2009, in Reynoldsburg, Ohio. The Summary can be downloaded from the NCWM web page:

http://www.ncwm.net/events/pdf/09_Software_Sector_Summary.pdf

Two NTETC Software Sector items have been accepted as Information items by the S&T Committee for inclusion in the Committee Reports for the NCWM 94th Annual Meeting in 2009. Information Items report on subjects and/or actions under consideration by the committee but not proposed for voting. The Committee Reports can be downloaded from the NIST Weights and Measures Division (WMD) web page:

http://ts.nist.gov/WeightsAndMeasures/Publications/upload/11-ST-09-Pub16-FINAL.doc

The two Information items, and several other Software Sector items, are summarized and discussed separately in Agenda Items 4.a, 4.b, 4.c, 4.d, and 4.e. (This information was included to facilitate discussion on the possible impact of these recommendations on GMMs, and ,NIR, Grain Analyzers.)

Discussion: Ms. Cassie Eigenmann, DICKEY-john, encouraged other meter manufacturers to get involved in the Software Sector and to attend their meetings, noting that what gets decided in those meetings can have a big effect on both existing meters and on the design of future meters.

Mr. Jim Truex, NTEP Administrator, explained that much of the work the Software Sector is doing will likely become General Code items that would affect every code in NIST Handbook 44 (HB 44). Fortunately, GMMs and NIR Grain Analyzers have their own specific codes which take precedent over the General Code when there are conflicts/differences. He urged the Sector to pay attention to what is happening so it can anticipate where changes or additions to the specific codes might be required.

4.a Item 310-2: Appendix D – Definition of Electronic Devices, Software-Based and Built-For-Purpose Device

Background: At the Software Sector's October 2007 meeting, it was initially suggested that the term "not-built-for-purpose" be removed from the wording in NIST HB 44 paragraph G-S.1.1., as there is no definition for a not-built-for-purpose device in HB 44. After a lengthy discussion related to the terms "built-for-purpose" and "not-built-for-purpose," the Software Sector agreed these terms were not clear and should be replaced with definitions based on the revision of *OIML R 76 Non-Automatic Weighing Instruments,* Subsections 5.5.1. (Type P) and 5.5.2. (Type U).

At the 2009 NCWM Interim Meeting, the S&T Committee received comments from the Scale Manufacturers Association (SMA) stating that it now opposes this item as there is no technological justification for making a distinction in software-based device types. Other comments were received taking issue with the SMA, position arguing that significant physical differences make the distinction necessary. The Software Sector recommended that this item remain Informational to allow further review. Following is the definition as it appeared the S&T Committee Report for the 94th Annual Meeting:

Electronic devices, software-based. – Weighing and measuring devices or systems that use metrological software to facilitate compliance with Handbook 44. This includes:

(a) Embedded software devices (Type P), aka built-for-purpose. – A device or element with software used in a fixed hardware and software environment that cannot be modified or uploaded via any interface without breaking a security seal or other approved means for providing security, and will be called a "P," or

(b) Programmable or loadable metrological software devices (Type U), aka not-built-for-purpose. – A personal computer or other device and/or element with PC components with programmable or loadable metrological software, and will be called "U." A "U" is assumed if the conditions for embedded software devices are not met.

Software-based devices – See Electronic devices, software-based.

At the Software Sector's March 2009 meeting, some discussion on the wording of the definitions resulted in the proposal of a slightly modified version (see below), but no consensus was reached on the language change shown below.

Electronic devices, software-based. Weighing and measuring devices or systems that use metrological software to facilitate compliance with Handbook 44. This includes:

(a) Type 'P' (aka built-for-purpose) software-based electronic devices. – A device or element with software used in a fixed hardware and software environment that cannot be modified or uploaded via any interface without breaking a security seal or other approved means for providing security;

(b) Type 'U' (aka not-built-for-purpose) software-based electronic devices. – All metrological software-based devices not meeting the conditions of a Type 'P' device. Example: a personal computer or other device and/or element with PC components with programmable or loadable metrological software.

Software-based devices – See Electronic devices, software-based.

Discussion: The differentiation between software embedded in a built-for-purpose measuring instrument (Type P) and software for measuring instruments using a universal computer (Type U) is well established in the European community. See **WELMEC *Software Guide (Measuring Instruments Directive 2004/22/EC)***. The designations Type P and Type U are also expected to be used in the General Code section of NIST Handbook 44 (HB 44).

Grain Analyzer Sector members were asked for comments on the definition proposed by the Software Sector at their March 2009 meeting. This prompted a lengthy discussion as Sector members tried to grasp the differences between P and U and to understand why it might be important to them. Some questioned, "Does the user care?" It was pointed out that there are security differences and field inspection differences.

When the Sector was asked to express a preference for the definition proposed by the Software Sector at their March 2009 meeting over the definition proposed as Item 310-2 in the S&T Committee Report for the 94th Annual Meeting, additional questions were raised. One member asked if there was anything in either of the two definitions that would cause problems for GMMs or NIR grain analyzers. The Co-Technical Advisor did not believe that there was anything in either of the two definitions themselves that would be troublesome for GMMs or NIR Grain Analyzers. He explained that the reason that this question of definitions had been placed on the Sector's agenda as the first software-related item was due to the following: software items require a thorough knowledge and understanding of what is meant by Type P and Type U. He strongly favored the definition proposed by the Software Sector in March of 2009 because of its clarity and sentence structure.

Mr. Andy Gell, Foss North America, was concerned about the definition for Type U devices (see part b of the definition above) possibly precluding any instrument that consists of a black box that requires a personal computer (PC) to be sitting next to it. In this case, the black box will not function without a PC being connected to it. Proprietary software loaded into a generic PC controls all the functions of the black box and calculates the results which can be displayed on the PC, stored on the PC, and printed on a generic printer attached to the PC. Because the PC was a generic PC capable of functioning as a regular PC, it appeared to the Sector that this would be a Type U device requiring the proprietary software to meet the general code requirements for Type U software. However, the system consisting of PC+software and black box would have to meet the requirements of the appropriate grain analyzer code. The Sector wondered if a single CC could be issued for this system. No decision was reached on this question.

Conclusion: The Sector reached a consensus that, at this point, the Software Sector's March 2009 definition was preferred over the definition that appeared as Item 310-2 in the S&T Committee Report for the 94th Annual Meeting.

Jim Truex, NTEP Administrator, recommended that the Sector's decision be forwarded to the Software Sector and to the S&T Committee.

4.b Item 310-3: G-S.1. Identification. – Software

Background: Beginning at the October 2007 meeting, the Software Sector discussed the value and merits of required markings for software. After several iterations, the Software Sector developed a table to reflect their positions. This table was submitted to NCWM S&T Committee and was assigned Developing status in 2008. However, the Software Sector did not include a recommendation on how to incorporate the proposal into existing G-S.1. and G-S.1.1. language. In particular, WMD was concerned about properly addressing the various existing requirements and multiple non-retroactive dates.

Prior to the NCWM 2009 Interim Meeting, NIST WMD commented on S&T Item 310-3, and presented an alternate proposal with significant modifications, which were included in the Interim Meeting Agenda background for the item (see 2009 Pub 15 for more details). The WMD proposal was subsequently accepted by the S&T Committee as Information Item 310-3 in the Committee Reports for the 94th Annual Meeting of the NCWM. The WMD proposal is reproduced below:

G-S.1. Identification. – For the purposes of identification, all equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect and manufactured on or after January 1, 201X, shall be clearly marked as specified in Table G-S.1. Identification and explained in the accompanying notes in Table G-S.1. Notes:

All equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect **and manufactured prior to January 1, 201X**, shall be clearly and permanently marked for the purposes of identification with the following information:

(a) the name, initials, or trademark of the manufacturer or distributor;

(b) a model identifier that positively identifies the pattern or design of the device;

(1) The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lowercase.
[Nonretroactive as of January 1, 2003]
(Added 2000) (Amended 2001)

*(c) a nonrepetitive serial number, except for equipment with no moving or electronic component parts and **Type U** **(not-built-for-purpose) software-based** devices;*
[Nonretroactive as of January 1, 1968]
(Amended 2003 **and 201X**)

(1) The serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.
[Nonretroactive as of January 1, 1986]

(2) Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No., and S. No.).
[Nonretroactive as of January 1, 2001]

*(d) the current software version or revision identifier for **Type U (not-built-for-purpose) software-based** devices;*
[Nonretroactive as of January 1, 2004]
(Added 2003) **(Amended 201X)**

(1) The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.
[Nonretroactive as of January 1, 2007]

(Added 2006)

(2) Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).
[Nonretroactive as of January 1, 2007]

(Added 2006)

(e) an NTEP Certificate of Conformance (CC) number or a corresponding CC Addendum Number for devices that have a CC. The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.)
[Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.
(Amended 1985, 1991, 1999, 2000, 2001, 2003~~, and~~, 2006**, and 201X**)

G-S.1.1. Location of Marking Information for Type U (Not-Built-For-Purpose), Software-Based Devices. – *For* ***Type U*** ~~***not built for purpose, software based***~~ *devices* ***manufactured prior to January 1, 201X,*** *either**:***

(a) The required information in G-S.1. Identification. (a), (b), (d), and (e) shall be permanently marked or continuously displayed on the device; or

(b) The Certificate of Conformance (CC) Number shall be:

(1) permanently marked on the device;

(2) continuously displayed; or

(3) accessible through an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to, "Help," "System Identification," "G-S.1. Identification," or "Weights and Measures Identification."

Note: *For (b), clear instructions for accessing the information required in G-S.1.(a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.*
[Nonretroactive as of January 1, 2004]
(Added 2003) (Amended 2006 **and 201X**)

Table G-S.1.
Identification for Devices Manufactured on or after January 1, 201X
(For applicable notes, see Table G-S.1. Notes on Identification)

Required Marking	Full Mechanical Devices and Separable Mechanical Elements	Type P Electronic Devices and Separable Elements	Type U Electronic Devices and Separable Elements
Name, initials, or trademark of the manufacturer or CC holder	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked, Continuously Displayed, or Via Menu (display) or Print Option (8)
Model identification information that positively identifies the pattern or design of the device (1)	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked, Continuously Displayed, or Via Menu (display) or Print Option (8)
Non-repetitive serial number (2)	Hard-Marked	Hard-Marked or Continuously Displayed	Not Acceptable
Software version or revision (3)	Not Applicable	Hard Marked (5), Continuously Displayed, or by Command (operator action) (6)	Continuously Displayed or Via Menu (display) or Print Option (8)
Certificate of Conformance number or corresponding CC Addendum (4)	Hard-Marked	Hard-Marked or Continuously Displayed	Hard-Marked (7) or Continuously Displayed

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.

(Added 201X)

Table G-S.1.
Notes on Identification for Devices Manufactured on or after January 1, 201X

1. **The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word.**
   - **The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).**
   - **The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lowercase.**

2. **Except for equipment with no moving or electronic parts, the serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.**
   - **Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No., and S. No.).**

3. **Metrologically significant software shall be clearly identified with the software version. The identification may consist of more than one part but one part shall be dedicated to the metrologically significant portion.**
   - **The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.**
   - **Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number."**
   - **Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number."**
   - **The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).**

4. **An NTEP Certificate of Conformance (CC) number or a corresponding CC Addendum Number for devices that have a CC. The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms "NTEP CC," "CC," or "Approval."**
   - **These terms may be followed by the word "Number" or an abbreviation of that word.**
   - **The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).**

5. **If the manufacturer declares that the primary sensing element "software" is integral, has no end user interface and no print capability, the version/revision shall be hard-marked on the device. Example: Primary sensing element may be Positive Displacement (P.D.) meter with integral correction, digital load cell (only for reference, not limiting).**

6. **Information on how to obtain the Version/Revision shall be included on the NTEP CC.**

7. **Hard-marking of the CC Number is permitted if no means of displaying this information is available.**

8. **Information on how to obtain the name, initials, or trademark of the manufacturer or CC holder, model designation, and software version/revision information shall be included on the NTEP CC.**

(Added 201X)

At the Software Sector's March 2009 meeting, several members were of the opinion that the perceived scope of their original proposal had been extended by the modifications proposed by WMD and had actually made the Sector's intent less clear. The Sector Chairman proposed revisiting the current text of G-S.1. to determine exactly what changes would be required to reflect the Sector's position. It was also noted that there was some validity to the SMA argument that there is no justification for differentiation of marking requirements based on device type P or U. After additional lengthy discussions, the following modified versions of G-S.1./G-S.1.1 were drafted. Although the Sector believed that a table was now unnecessary, they also suggested what the table should look like if one was

desired. They also pointed out that the second table of notes, as proposed by WMD, was now redundant as the notes were incorporated in their suggested table.

The Software Sector's March 2009 proposal is shown below:

G-S.1. Identification. – All equipment, except weights and separate parts necessary to the measurement process but not having any metrological effect **and manufactured after January 1, 201X**, shall be clearly and permanently marked for the purposes of identification with the following information:

(a) the name, initials, or trademark of the manufacturer or distributor;

(b) a model identifier that positively identifies the pattern or design of the device;

(1) The model identifier shall be prefaced by the word "Model," "Type," or "Pattern." These terms may be followed by the word "Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.). The abbreviation for the word "Model" shall be "Mod" or "Mod." Prefix lettering may be initial capitals, all capitals, or all lower case.
[Nonretroactive as of January 1, 2003]
(Added 2000) (Amended 2001)

*(c) a nonrepetitive serial number, except for equipment with no moving or electronic component parts and **software that is not part of a Type P (built-for-purpose) device**;*
[Nonretroactive as of January 1, 1968]
(Amended 2003 **and 201X**)

(1) The serial number shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required serial number.
[Nonretroactive as of January 1, 1986]

(2) Abbreviations for the word "Serial" shall, as a minimum, begin with the letter "S," and abbreviations for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., S/N, SN, Ser. No., and S. No.).
[Nonretroactive as of January 1, 2001]

*(d) the current software version or revision identifier for software-based **electronic** devices;*
[Nonretroactive as of January 1, 2004]
(Added 2003)**(Amended 201X)**

(1) The version or revision identifier shall be prefaced by words, an abbreviation, or a symbol, that clearly identifies the number as the required version or revision.
[Nonretroactive as of January 1, 2007]
(Added 2006)

(2) Abbreviations for the word "Version" shall, as a minimum, begin with the letter "V" and may be followed by the word "Number." Abbreviations for the word "Revision" shall, as a minimum, begin with the letter "R" and may be followed by the word "Number." The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).
[Nonretroactive as of January 1, 2007]
(Added 2006)

(e) an NTEP Certificate of Conformance (CC) number or a corresponding CC Addendum Number for devices that have a CC. The CC Number or a corresponding CC Addendum Number shall be prefaced by the terms "NTEP CC," "CC," or "Approval." These terms may be followed by the word

"Number" or an abbreviation of that word. The abbreviation for the word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).
[Nonretroactive as of January 1, 2003]

The required information shall be so located that it is readily observable without the necessity of the disassembly of a part requiring the use of any means separate from the device.

(Amended 1985, 1991, 1999, 2000, 2001, 2003, and 2006)

***G-S.1.1. Method of Marking Information for all Software-Based Devices**. – For devices **manufactured after January 1, 201X,** either:*

(a) The required information in G-S.1 Identification. shall be permanently marked or continuously displayed on the device; or

(b) The Certificate of Conformance (CC) Number shall be:

(1) permanently marked on the device;

(2) continuously displayed; or

(3) accessible through an easily recognized menu and, if necessary, a submenu. Examples of menu and submenu identification include, but are not limited to, "Help," "System Identification," "G-S.1. Identification," or "Weights and Measures Identification."

***Note:** For (b), clear instructions for accessing the information required in G-S.1. (a), (b), and (d) shall be listed on the CC, including information necessary to identify that the software in the device is the same type that was evaluated.*

[Nonretroactive as of January 1, 2004]

(Added 2003) (Amended 2006 **and 201X**)

Table G-S.1. Identification for Devices Manufactured on or after January 1, 201X		
Required Marking	**Full Mechanical Devices and Separable Mechanical Elements**	**Electronic Devices, Software Based**
Manufacturer or CC holder ID	**Hard-Marked**	**Hard-Marked, Continuously Displayed, Via Menu (display) or by command (operator action)**
Model identification	**Hard-Marked**	**Hard-Marked, Continuously Displayed, Via Menu (display) or by command (operator action)**
Serial number	**Hard-Marked**	**Hard-Marked, Continuously Displayed[1]**
Metrologically Significant Software version	**Not Applicable**	**Continuously Displayed, Via Menu (display) or by command (operator action)[2]**
Certificate of Conformance number	**Hard-Marked**	**Hard-Marked, Continuously Displayed, Via Menu (display) or by command (operator action)[3]**

[1]Type 'U' devices need not have a non-repetitive serial number.

[2]If the manufacturer declares that the primary sensing element "software" is integral, has no end user interface and no print capability, the version/revision shall be hard-marked on the device. Example: Primary sensing element may be Positive Displacement (P.D.) meter with integral correction, digital load cell (only for reference, not limiting).

[3]If the Certificate of Conformance number is to be displayed via menu and/or submenu, the means of access must be easily recognizable. In addition, instructions on how to obtain the remaining required information not hard-marked or continuously displayed shall be included on the NTEP CC.

Discussion/Conclusion: All GMMs and NIR Grain Analyzers currently holding active CCs are of Type P. For these devices it would appear that the requirement for marking the Software Version/Revision of the metrologically significant portion would be the only change required to comply with the proposed marking for Type P devices.

The Grain Analyzer Sector's Co-Technical Advisor suggested that the Software Sector's March 2009 proposal does not address the WMD's concerns regarding addressing various existing requirements and multiple non-retroactive dates. In the Software Sector's proposal, both ***G-S.1. Identification*** and ***G-S.1.1. Method of Marking Information for all Software-Based Devices*** include a statement indicating that the following subparagraphs apply to equipment **"manufactured after January 1, 201X"** implying that G-S.1. and G-S.1.1 do NOT apply to equipment manufactured prior to that date. However, the subparagraphs indicate added, amended, and non-retroactive dates ranging from 1968 to 2007. The Software Sector's proposal is unclear as to which, if any paragraphs/subparagraphs apply to equipment manufactured prior to 201X. The NIST WMD proposal clearly indicates which requirements are applicable to devices manufactured before January 1, 201X, and which are applicable to devices manufactured after January 1, 201X.

The Sector was in general agreement that the NIST WMD proposal was less confusing from an enforcement point of view.

4.c Identification of Certified Software

Background: The Software Sector's work on this item originated as an attempt to answer the question, "How does the field inspector know that the software running in the device is the same software that was evaluated and approved by the lab." The Software Sector is developing language to be added to HB 44 that will include requirements similar to those developed by OIML. The initial draft of the Software Sector's proposed language (for G-S.1.1. Location of Marking Information for Not-Built-for-Purpose, Software-Based Devices) is shown below:

> **Identification of Certified Software:**
>
> **Software-based electronic devices shall be designed such that the metrologically significant software is clearly identified. The identification of the software shall be inextricably linked to the software itself.**
> - **Unique identifier must be displayable/printable on command or during operation, etc. (marking req't in addition)**
> - **At a minimum, a version/revision indication (1.02.09, rev 3.0 a, etc). Could also consist of/contain checksum, etc (crc32, for example)**

Discussion: All GMMs and NIR Grain Analyzers currently holding active CCs are of Type P. The metrologically significant, or legally relevant, software elements of these devices can be classified as either "Fixed" or "Other" as shown below:

Fixed:
- Main program
- Associated subroutines
- Type specific parameter tables (set by the manufacturer)

Other:
- Device specific parameter tables (set by the manufacturer or a competent service representative)
- Site specific parameter tables (set by user and verified by field inspection)
- Individual Grain Calibrations (periodically changed, frequently by user; verified by field inspection.)

In order for software to have a unique identifier that is "inextricably linked to the software itself" the software must be Fixed so that any change made after certification is reflected by a change in the unique identifier. Alternate methods may have to be found to identify the versions of the software elements classified as Other.

For Grain calibrations, the requirements for version identification are specified in existing HB 44 code. Grain calibrations are individually identified and are required to be self-checking against data corruption or alteration (see **HB 44, §5.56.(a)** paragraphs **S.2.4.1. Calibration Version and S.2.4.2. Calibration Corruption** and **HB 44, §5.57.** paragraphs **S.2.5.2. Calibration Version** and **S.2.5.3. Calibration Corruption**)

Site specific parameters and device specific parameter tables (e.g., any tables or parameters residing in software to normalize the response of like instruments) currently are not required to be identified by version, but existing code requires these to be secured by a physical seal or an audit trail.

Dr. Richard Pierce, GIPSA (the NTEP Participating Laboratory for Grain Analyzers), wondered if there might be a problem with the way GMM CCs have been handled in the past. The example he cited was related to GMMs that also have test weight per bushel (TW) capability. Such devices have an extra sensor to determine if there is adequate sample in the hopper for a TW measurement. Presently, a GMM without TW capability and the same model with TW capability are both covered under the same CC. In some cases, they have the same instrument identifier. If they should happen to use two different software versions with different identifiers, it could be very difficult if all the different options have to be tracked. Many different CCs might be required for the same basic instrument.

The Sector Co-Technical Advisor did not think that separate CCs would be required. If the software had different identifiers, they could all be listed on the same CC with a description of which one was applicable to the basic instrument and which one was applicable to the version with TW capability.

Mr. Jim Truex, NTEP Administrator, reported that this was already being done on CCs for point of sale systems. NCR offers multiple software versions on the same device.

Dr. Charles Hurburgh, Iowa State University, remarked that device specific and site specific parameters for NIR Analyzers will become much more complicated than slope and bias. Eight to ten different algorithms, some very complex and some with virtual coefficients, are now available to adjust one instrument to match another. He was of the opinion that getting locked in as to what is Fixed could create problems. When asked if all the algorithms would behave the same over the operating temperature range his reply was, "Absolutely not!" It was pointed out that each algorithm would have to be evaluated separately to convince the NTEP lab that these device specific algorithms do not affect the operating characteristics of the device (temperature range, etc.).

It was later proposed that if these algorithms were calibration specific and the manufacturer could demonstrate that they would be invoked/applied only to non-NTEP grains or non-NTEP constituents, they would not have to be evaluated.

When the discussion returned to the subject of alternate ways to handle device specific parameters, Dr. Pierce suggested that if you standardize an instrument at the factory and have Device Specific adjustments (as opposed to type specific adjustments), a checksum could be used to protect those specific adjustments against corruption in the same manner that grain calibrations are protected. Although individual instruments would all have different standardizing packages, as long as those do not change, unless service is performed) the need to assign a version to those adjustments seems unnecessary.

Mr. Ole Rasmussen proposed defining actual code as the actual compiled machine code that is changed by re-compiling source code. Then, what is actual code can be separated from those parameters that are tracked by audit trail, parameters which could be user definable or service changeable. Code is not re-compiled when simply making an adjustment to that device.

Expanding on Dr. Pierce and Mr. Rasmussen's suggestions, the Sector Technical Advisor outlined how these parameters might be protected. Put service/standardization parameters in a module/table/file that contains all the adjustment parameters plus a stored checksum for that instrument's unique set of parameter values. At instrument start-up, the main program calculates a checksum based on that unique set of parameter values and compares it with the stored checksum. If they do not match, the instrument cannot proceed further and it displays an error code/message. To save audit trail memory space, he proposed that the individual corrupted parameter values not be logged in the audit trail. It would be sufficient to log only the error or error code for the type of error (e.g., corrupted standardization parameters).

The discussion moved to what the software identification might look like and how changes might be tracked.

Several members suggested that the software version might look like:

3.yy.xx where 3 is the version that was originally evaluated, yy are metrologically significant changes that are compatible with older instruments running other 3.yy.xx versions, and xx can be any sequentially issued change that does not need new approval, a non-metrologically significant change. Typically, yy versions do not require re-testing, but will require notifying the NTEP lab. A revised CC may or may not be required.

4.yy.xx where 4 is incompatible with older versions of the instruments in the field and cannot be used in instruments of that type manufactured prior to a given serial number or manufacturing date. A revised or new CC will be required. If a revised CC is issued, the revised CC must list the various older revisions and the range of serial numbers on which they can be used.

Mr. Jim Truex remarked on the importance of software having to be identified and that the identification is going to have to be available to the inspector.

The discussion shifted to what "inextricably linked" means; how much security is required to guarantee that the displayed software identification number has the actual approved software behind it? Is it sufficient to embed the version number in the fixed portion of the code (before it is compiled) and to include in the code a routine for displaying that number upon command, or must the version number be scrambled or otherwise hashed before being embedded in the fixed portion of the code? These questions were not answered.

Dr. Pierce commented that he does not see GIPSA with a software engineer in the NTEP lab examining the software, or the NTEP lab sending the device elsewhere for the software to be examined.

Mr. Truex replied, "We're not going to have software engineers, but we will be requesting information from manufacturers about their software." (See the following agenda item.)

4.d Software Protection/Security

Background: The Software Sector derived a trial Publication 14 checklist based on the OIML checklist to verify that the software adequately protected against fraudulent modification as well as accidental or unintentional changes. The checklist has been distributed to current NTEP labs for use on a trial basis for new type approval applications.

Devices with embedded software TYPE P (aka built-for-purpose)			
	Declaration of the manufacturer that the software is used in a fixed hardware and software environment, and		Yes☐ No ☐ N/A ☐
	cannot be modified or uploaded by any means after securing/verification		Yes☐ No ☐ N/A ☐
	Note: *It is acceptable to break the "seal" and load new software, audit trail is also a sufficient seal.*		
	The software documentation contains:		
		description of the (all) metrologically significant functions OIML states that there shall be no undocumented functions	Yes☐ No ☐ N/A ☐
		description of the securing means (evidence of an intervention)	Yes☐ No ☐ N/A ☐
		software identification	Yes☐ No ☐ N/A ☐
		description how to check the actual software identification	Yes☐ No ☐ N/A ☐
	The software identification is:		
		clearly assigned to the metrologically significant software and functions	Yes☐ No ☐ N/A ☐
		provided by the device as documented	Yes☐ No ☐ N/A ☐
Personal computers, instruments with PC components, and other instruments, devices, modules, and elements with programmable or loadable metrologically significant software TYPE U (aka not built-for-purpose)			
	The *metrologically significant* software is:		
		documented with all relevant (see below for list of documents) information	Yes☐ No ☐ N/A ☐
		protected against accidental or intentional changes	Yes☐ No ☐ N/A ☐
	Evidence of intervention (such as, changes, uploads, circumvention) is available until the next verification/inspection (e.g., physical seal, Checksum, CRC, audit trail, etc. means of security)		Yes☐ No ☐ N/A ☐

Software with closed shell (no access to the operating system and/or programs possible for the user)			
	Check whether there is a complete set of commands (e.g., function keys or commands via external interfaces) supplied and accompanied by short descriptions		Yes☐ No ☐ N/A ☐
	Check whether the manufacturer has submitted a written declaration of the completeness of the set of commands		Yes☐ No ☐ N/A ☐
Operating system and/or program(s) accessible for the user:			
	Check whether a checksum or equivalent signature is generated over the machine code of the metrologically significant software (program module(s) subject to legal control W&M jurisdiction and type-specific parameters)		Yes☐ No ☐ N/A ☐
	Check whether the metrologically significant software will detect and act upon any unauthorized alteration of the metrologically significant software using simple software tools (e.g., text editor)		Yes☐ No ☐ N/A ☐
Software interface(s)			
	Verify the manufacturer has documented:		
		the program modules of the metrologically significant software are defined and separated	Yes☐ No ☐ N/A ☐
		the protective software interface itself is part of the metrologically significant software	Yes☐ No ☐ N/A ☐
		the *functions* of the metrologically significant software that can be accessed via the protective software interface	Yes☐ No ☐ N/A ☐
		the *parameters* that may be exchanged via the protective software interface are defined	Yes☐ No ☐ N/A ☐
		the description of the functions and parameters are conclusive and complete	Yes☐ No ☐ N/A ☐
		there are software interface instructions for the third party (external) application programmer	Yes☐ No ☐ N/A ☐

Discussion: It was pointed out that the draft checklist should have been distributed to manufacturers rather than NTEP labs. The checklist relates to information that the manufacturer might be asked to submit to the NTEP lab with a new application for evaluation. Grain Analyzer Sector members were asked to see what might be involved in supplying the requested information. There was no further discussion of this item.

4.e Software Maintenance and Reconfiguration

Background: The Software Sector has followed the lead of OIML in defining two procedures used to check software updates for authenticity and integrity and has agreed upon the following language:

> **Verified Update:** A verified update is the process of installing new software where the security is broken and the device must be re-verified. Checking for authenticity and integrity is the responsibility of the owner/user.
>
> **Traced Update:** A traced update is the process of installing new software where the software is automatically checked for authenticity and integrity, and the update is recorded in a software update log or audit trail.

The Software Sector has worked on language for defining the requirements for a traced update. Their draft specifies, "For a traced update, an event logger is required . . .." The draft goes on to say that the use of a Category 3 audit trail is acceptable for the software update logger. The requirements the Software Sector has proposed for Category 3 audit trails are quite similar to the requirements for Category 3 audit trails in the GMM and NIR sections of HB 44 and Publication 14.

The Software Sector also proposed the addition of new text to the General Code section of HB 44:

> **G-S.9. Metrologically Significant Software Updates. –** The updating of metrologically significant software shall be considered a sealable event. Metrologically significant software that does not conform to the approved type is not allowed for use.

The NTEP Administrator was of the opinion that the proposed G-S.9. was unnecessary, because G-S.8. already requires that any changes that affect metrological function are sealable. The Software Sector felt that the explicit language proposed for G-S.9. is clearer than any implied requirement in G-S.8. The Software Sector decided to ask for clarification/interpretation from the S&T Committee.

Discussion: OIML D 31:2008 (E) includes flow charts illustrating the implementation of traced and verified updates (reproduced at the end of this agenda item). The Sector questioned the need for a definition of traced update. The traced update was probably intended to cover cases in Europe where the National Body controls a network of devices and wants to update all the devices simultaneously from a central location. Denmark and France do this with NIR Grain Analyzers. It is unlikely that a traced update would be used in the United States for Gain Analyzers that fall under state W&M jurisdiction. Verification would still be required by state inspectors.

Mr. Ole Rasmussen, Foss North America, commented on the OIML diagram for traced update, comparing it to the situation where a device in the field has calibrations and much of the device's specific information on a memory stick. It is possible to go to the company's website, download all the necessary new calibrations and information on the memory stick, and plug it back into the device. The downloaded information is serial number specific for that device. The user license is checked, and all the information is checked for integrity and authenticity. Because there is no person at place to verify it he believed that this is essentially a traced update.

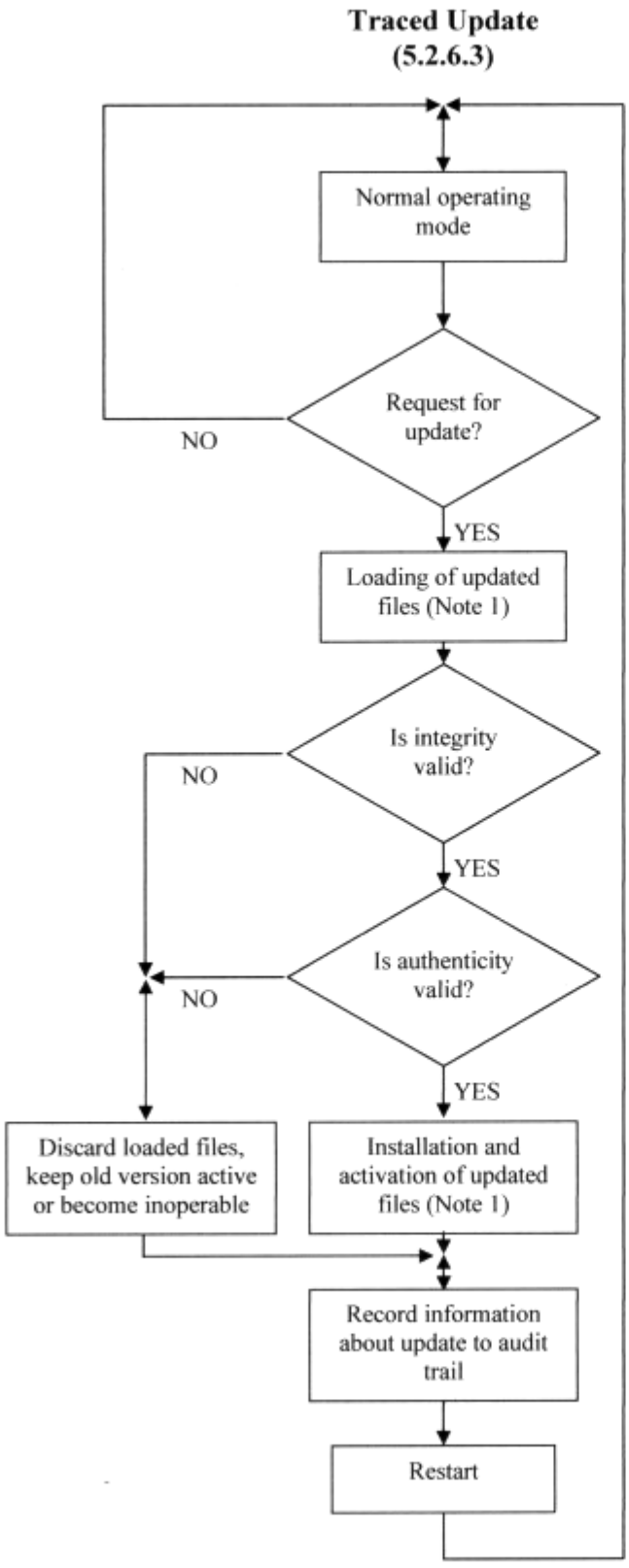
When asked whether information about the update was recorded to the audit trail, Mr. Rasmussen explained that it depended on how that was defined. The information is all on the server. That could be called an audit trail; it just does not reside on the device.

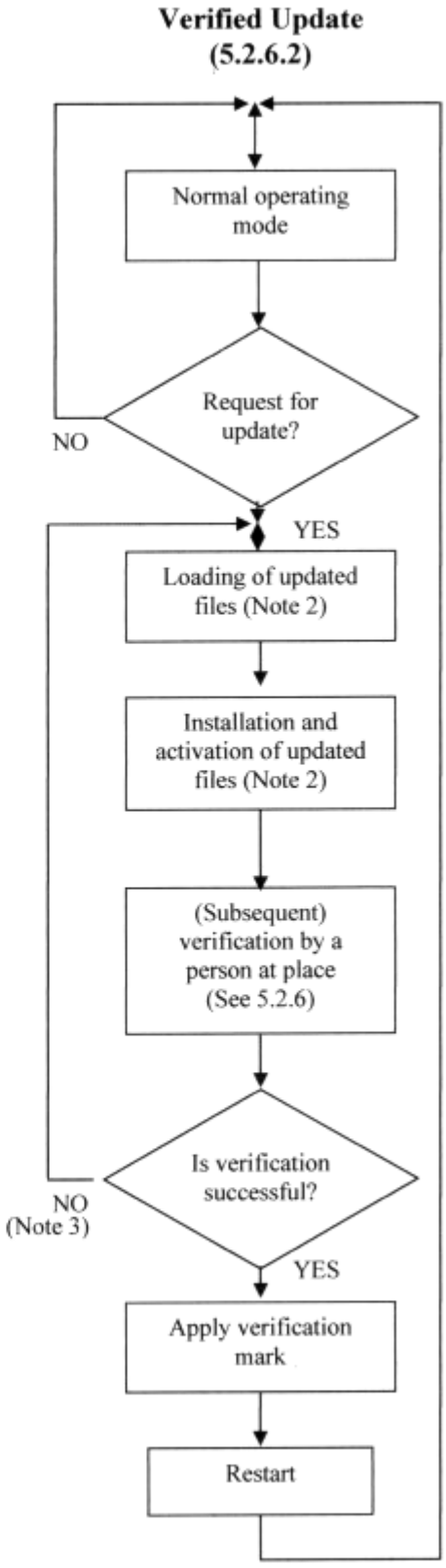
The Sector Co-Technical Advisor maintained that this example involves a Type P device, and that this update falls under the category of a verified update the same as if software was being downloaded (whether over a high-speed data link, a thumb drive, or from a local or remote PC, etc.), and, therefore, would have to meet the security requirements for a Type P device. It would be up to the local authority to verify that the downloaded version of software agrees with what's on the CC.

Dr. Pierce added that in this case, the user has no control over the process as he is simply moving the memory stick from the computer to the instrument. This says,in essence, that the manufacturer is installing the updates.

Verification is defined as a procedure, other than type approval, that includes the examination and marking and/or issuing of a verification certificate that ascertains and confirms that the measuring instrument complies with the statutory requirements. This means that the local authority (the state) confirms that the device meets the applicable requirements of HB44 and conforms to the CC.

In the OIML flow chart for verified update, the three boxes titled: "(Subsequent) verification by a person at place"; "Is verification successful?"; and "Apply verification mark" are decisions/operations that would be made by state W&M personnel.


Traced Update
(5.2.6.3)
Normal operating mode
Request for update?
NO
YES
Loading of updated files (Note 1)
Is integrity valid?
NO
YES
Is authenticity valid?
NO
YES
Discard loaded files, keep old version active or become inoperable
Installation and activation of updated files (Note 1)
Record information about update to audit trail
Restart


Verified Update
(5.2.6.2)
Normal operating mode
Request for update?
NO
YES
Loading of updated files (Note 2)
Installation and activation of updated files (Note 2)
(Subsequent) verification by a person at place (See 5.2.6)
Is verification successful?
NO
(Note 3)
YES
Apply verification mark
Restart

Software Update Procedure – from OIML D 31:2008 (E)

Notes:

(1) In the case of a Traced Update updating is separated into two steps: "loading" and "installing/activating." This implies that the software is temporarily stored after loading without being activated because it must be possible to discard the loaded software and revert to the old version, if the checks fail.

(2) In the case of a Verified Update, the software may also be loaded and temporarily stored before installation but, depending on the technical solution, loading and installation may also be accomplished in one step.

(3) Here, only failure of the verification due to the software update is considered. Failure due to other reasons does not require re-loading and re-installing of the software symbolized by the NO-branch.

5. Report on New GIPSA/NIST Interagency Agreement for 2010 – 2014

The present five year Interagency Agreement that provides funding for the Grain Moisture Meter On-going Calibration Program (OCP) expires at the end of the Federal Government's Fiscal Year 2009 (September 30, 2009). Under the proposed terms of the new agreement NIST and GIPSA each contribute one-third the cost of the program subject to an annual maximum of $30,000 each. The balance of costs is borne by manufacturers and is dependent on the number of meter models in the NTEP pool according to a fee schedule (see table below). Ms. Diane Lee, NIST/WMD, reported that NIST's legal office has been reviewing the Interagency Agreement. She anticipated receiving their approval by early 2010 after which the Agreement would be forwarded to GIPSA for the appropriate signatures.

Dr. Rich Pierce, GIPSA, indicated that the fee schedule remains as shown in the table below. It appears that five meters will be in the plan at a cost to each manufacturer of $6000 per meter type, per year. If another meter type increases the number of meters to six, the cost to each manufacturer will increase to $8750 per meter type per year.

Explanation of columns in the Fee Schedule table:

Column	**Explanation (or formula for calculating)**
(1) Total Meters	The number of meter types (including the Official GIPSA meter) that will share in the NTEP calibration costs.
(2) Total Meters in NTEP Pool	The number of meter types other than the Official meter that will share in the NTEP calibration costs.
(3) Cost per Pool Meter	The cost associated with each pool meter in the program.
(4) Total Program Cost	A per meter type cost of $22,500 times the number of NTEP "pool" meters.
(5) NIST Contribution	One-third the total program cost up to a maximum of $30,000.
(6) GIPSA Contribution	One-third the total program cost up to a maximum of $30,000.
(7) Manufacturers Contributions (total funding from manufacturers)	Total Program Cost minus NIST Contribution minus GIPSA Contribution.
(8) Cost per Meter Type	Manufacturers' Contributions divided by Total Meters (including the Official meter).

Proposed NTEP On-going Calibration Program Fee Schedule For Year 2010 to 2014							
(1) TotalMeters (includingofficial meter)	(2) Meters In NTEP Pool	(3) Cost Per Pool Meter	(4) TotalProgram Cost	Funding Contribution From Participants			
				(5) NIST	(6) GIPSA	(7) Mfg's (total funding from mfg's)	(8) Cost Per Meter Type
2	1	22,500	22,500	7,500	7,500	7,500	3,750
3	2	22,500	45,000	15,000	15,000	15,000	5,000
4	3	22,500	67,500	22,500	22,500	22,500	5,625
5	4	22,500	90,000	30,000	30,000	30,000	6,000
6	5	22,500	112,500	30,000	30,000	52,500	8,750
7	6	22,500	135,000	30,000	30,000	75,000	10,715
8	7	22,500	157,500	30,000	30,000	97,500	12,185
9	8	22,500	180,000	30,000	30,000	120,000	13,335

6. Report on OIML TC 17/SC 1 R 59 "Moisture Meters for Cereal Grains and Oilseeds"

Background: This item was included on the Sector's agenda to provide a summary of the activities of OIML TC 17/SC 1. In October 2008, the Secretariat of TC 17/SC 1 was jointly allocated to China and the United States. The Co-Secretariats (China and the United States) are working closely with an IWG to revise OIML R 59 "Moisture meters for cereal grains and oilseeds." The 5 CD of **OIML R 59**, revised to comply with OIML's Guide ***Format for OIML Recommendations*** and to incorporate tests for the recommended disturbances of **OIML D 11** ***General Requirements for Electronic Measuring Instruments***, was distributed to the U.S. National Working Group (USNWG) in March 2009 with a request for comments by May 21, 2009. The changes to R 59 5 CD are summarized below:

- Extensive reformatting to comply with OIML's Guide ***Format for OIML Recommendations***, OIML B 6-2, ***Directives for Technical Work*** – *Part 2*, and the April 2008 OIML Secretariat training.
- Changes to address the comments received to 4 CD.
- Changes to the MPE tables.
- Added requirements for software.
- Added OIML D11 tests.
- Added test report section - B.
- Added new Section 3, Description of instruments.
- Added definitions.
- Revised the bibliography section.
- Explanatory notes includes a history of the TC 17/SC 1 meetings and committee draft revisions.
- Added cross reference table of OIML R 59 5 CD and OIML ***Directives for Technical Work***
- Added cross reference table of OIML R 59 5 CD and OIML D 11

Discussion: Ms. Diane Lee, NIST/WMD, reported that she had received approximately 170 comments from 10 countries. The next version, R 59 CD 6, will be sent out for a vote. She asked the Sector to discuss the OIML D 11 tests that are included in R 59, and if some of the tests are not appropriate for moisture meters, provide technical reason as to why they should not be included. She explained that this may be the last opportunity to provide comments, because the next step for this draft recommendation will be voting for its acceptance as an approved OIML Recommendation. Special attention should be paid to the .disturbance tests from OIML D 11.

The following table lists the tests in question and shows where their test procedures are located in 5 CD of R 59.

Immunity tests of IEC 61326 and/or Recommended Disturbances in OIML D 11	**Test Procedure Section (As appropriate, severity levels are included in test procedures, Annex A)**
Sand and Dust	A.4.1
Short time power reduction	A.4.2
Bursts	A.4.3
Radiated radiofrequency, electromagnetic susceptibility	A.4.4
Conducted radiofrequency fields	A.4.5
Electrostatic discharges	A.4.6
Mechanical shock	A.4.7

Ms. Cassie Eigenmann, DICKEY-john Corporation, expressed concern over the inclusion of the sand and dust test. She was of the opinion that grain moisture meters (GMMs) are not located in areas subject to the sand and dust concentrations that they would be exposed to under the conditions described in D 11, citing paragraph **8.2.4 Sand and Dust** from OIML D 11:

> This test is mainly applicable for instruments or parts of instruments typically being used in dusty warehouses and in the building industry (for instance production of concrete) or, in some climatic regions, in the open air. Therefore, it is advised to prescribe test 10.5 in the relevant Recommendation only for those measuring instruments that can be expected to be typically used under sandy/dusty conditions (refer to 4.4).
>
> (Note: **D 11 4.4** shown below for reference)
> **4.4** Some of the tests described in this Document may be relevant only for specific kinds of instruments. Therefore, a test should be included for a particular kind of instrument only if that instrument is likely to be significantly influenced by the test, under the instrument's specified operating conditions.

The Sector's Co-Technical Advisor noted that D 11 gives only a vague description of how the test is to be performed: A brief description of the test in D 11 Section 10.5 states:

> The test consists of exposure to cyclic temperature variation between 30 °C and 65 °C, maintaining the following conditions:
>
> - Relative humidity: less than 25 %
> - Air velocity: 3 m/s
> - Particle concentration: 5 g/m^3
> - Composition of the particles: as specified in 3.2.1 of IEC 60512-11-8 [17]

He questioned the severity of the test with regard to the concentration of 5 grams per cubic meter.

Mr. Dave Krejci, Grain Elevator & Processing Society (GEAPS), remarked that 5 grams per cubic meter seems excessively dusty, and that he couldn't imagine people operating a meter in those conditions without wearing a respirator. Table Z-1, Limits for Air Contaminants, in OSHA Regulation 29CFR1910-1000 originally set grain dust

limits of no more than 10 milligrams per cubic meter for wheat, barley, and oats grain dust and 15 milligrams per cubic meter for other grains. Those limits were set aside by a court challenge, because they were based on limits established by the American Conference of Governmental Industrial Hygienists (ACGIH) without sufficient scientific basis. Table Z-1 in the current issue of 29CFR1910-1000 lists a limit of 10 milligrams per cubic meter for particulates not otherwise regulated (PNOR). Grain dust falls under that category. He believed that an argument could be made that people operating GMMs are not wearing respirators so the instruments are not being exposed to dust concentrations anywhere near 5 grams per cubic meter.

In addition, he pointed out that if a GMM was expected to operate in an atmosphere of 5 grams per cubic meter, it would be required to have a dust-tight or weather-tight enclosure. There is nothing in R 59 requiring a dust-tight or weather-tight enclosure, so it seems illogical to require a sand and dust test. In the United States, if a GMM was being operated in the sand and dust environment tested for, it would be a violation of the electrical codes for hazardous locations unless the enclosure was a NEMA9 or the GMM was intrinsically safe (which they are not).

One Sector member asked if a case could be made for retaining the sand and dust test on the basis of accelerated testing for an operating environment with a low level of dust (below 10 mg/m^3) that is allowed to accumulate over a long period of time. Sector members were quick to respond that there are user requirements that specify that instruments are to be maintained in good working condition, so there should be no large accumulation. Others also pointed out that user manuals typically specify the installation conditions such as, "Avoid a hazardous (classified) location as defined in Article 500 of the NFPA Handbook of the National Electrical Code," and "Choose a clean environment …"

The Sector agreed that A.4.1 sand and dust should be removed from R59.

Dr. Rich Pierce, GIPSA (the NTEP Participating Laboratory for Grain Analyzers), took issue with the D 11 tests as they had been incorporated in R 59 5 CD. It was his opinion that they are too vague, and do not give sufficient details (e.g., what grains are to be used, how many drops, initial conditions, whether the instrument was turned on or turned off, etc.) When D11 tests are incorporated in specific Recommendations, these additional details have to be specified. This detail is needed to assure that when a device is tested in country "B it's done the same way it was done in country "A."

The Co-technical Advisor called the Sector's attention to several other shortcomings to 5 CD:

> **A.4.4 Radiated radio-frequency electromagnetic fields** – R 59 should also specify wiring to and from the GMM from any and all ports. The paragraph:
>
> The equipment under test is subjected to 20 discrete frequency bands of electromagnetic radiation in the frequency range 26 MHz to 1000 MHz, at a field strength of either 10 V/m (for electromagnetic environment E1) or 10 V/m (for electromagnetic environment E2) appears to be in conflict with the previously described tests.
>
> **A.4.5 Conducted radio-frequency fields** – This item is missing from Annex B. R 59 should also specify wiring to and from the GMM for any and all ports.
>
> Need to add:
> The difference between the intrinsic error and the error (of indication) measured while the EUT is subjected to conducted radio-frequency fields, at the same reference conditions, shall not exceed the maximum permissible error in the specified operating range (or significant faults are detected and acted upon by means of a checking facility).
>
> **A.4.7 Mechanical shock** – This item is missing from Annex B.
>
> Need to add:
> The difference between the intrinsic error and the error (of indication) measured after the EUT is subjected to mechanical shock, at the same reference conditions, shall not exceed the maximum

permissible error in the specified operating range (or significant faults are detected and acted upon by means of a checking facility).

Conclusions/Summary: The Sector agreed that A.4.1 sand and dust should be removed from R 59. The sand and dust concentration specified for that test far exceeds the acceptable level of particulate concentration for human health unless an approved respirator (or OSHA approved dust mask) is worn, and it is known that GMM operators do not wear respirators. [References: Table Z-1 Limits for Air Contaminants for PNOR in OSHA Regulation 29CFR1910-1000.]

The Sector is also concerned that the present wording of the new tests in Annex A is too vague. They are not detailed enough to specify which grains are to be used. Is it necessary to use all grains for this test? Can a single grain be used? Can another grain be substituted? From what moisture range should the test samples be selected? Do you drop the sample one time through the instrument or multiple times? If multiple times, can you average the results? If you have to repeat the tests under several different conditions (as at maybe 20 or more different frequencies), is the same grain sample going to be used for each frequency? By the time D 11 requirements come into a Recommendation, the test procedures should be very specific.

The corrections/additions to **A.4.4**, **A.4.5**, and **A.4.7** detailed above, should be incorporated. **Annex B** should be edited to include references to A.4.5 and A.4.7.

The Sector is of the opinion that CD 5 as it exists today is not ready for a final vote.

7. Report on OIML TC17/SC8 Draft IR "Protein Measuring Instruments for Cereal Grain"

Background: This item was included on the Sector's agenda to provide a summary of the activities of OIML TC 17/SC 8. A new subcommittee has been formed to study the issues and write a working draft document "Measuring instruments for protein determination in grains." Australia is the Secretariat for this new subcommittee. A TC 17/SC 8 meeting was hosted by NIST in September 2007 to discuss the 2 CD. Discussions on 2 CD dealt mostly with maximum permissible errors (MPEs) and harmonization of the TC 17/SC 8 Recommendation for protein with the TC 17/SC 1 Recommendation for moisture.

Discussion: Ms. Diane Lee reported that she had not received an updated draft Protein Recommendation from Australian Secretariat, Dr. Grahame Harvey, so she was not sure what the status is concerning the Protein Recommendation. It has been difficult to follow the version and revisions to the protein document because the United States has not received regular updates or lists of comments to the revisions.

Dr. Pierce commented that at the conclusion of the joint meeting of SC 1 and SC 8 in October 2007, the two respective documents were closely aligned. However, the 5 CD of R 59 does not look anything like the version of R 59 that came out of the meeting in October 2007. He speculated that SC 8 was waiting to see what SC 1 comes up with before they come out with another draft.

8. Air-Oven Collaborative Study

Background: NIST-WMD's laboratory measurement traceability program requires that laboratories participate in interlaboratory and other collaborative experiments. A structured collaborative air oven study was last conducted following the 2000 harvest. Results of that study were reported at the Sector's August 2001 meeting. At its August 2008 meeting, the Sector agreed that a collaborative study was long overdue. It was also noted that such a study addresses the measurement traceability requirements of ISO 17025 *General requirements for the competence of testing and calibration laboratories*. Mr. Karl Cunningham, Illinois, subsequently agreed that the State of Illinois Moisture Meter Laboratory would serve as the pivot laboratory.

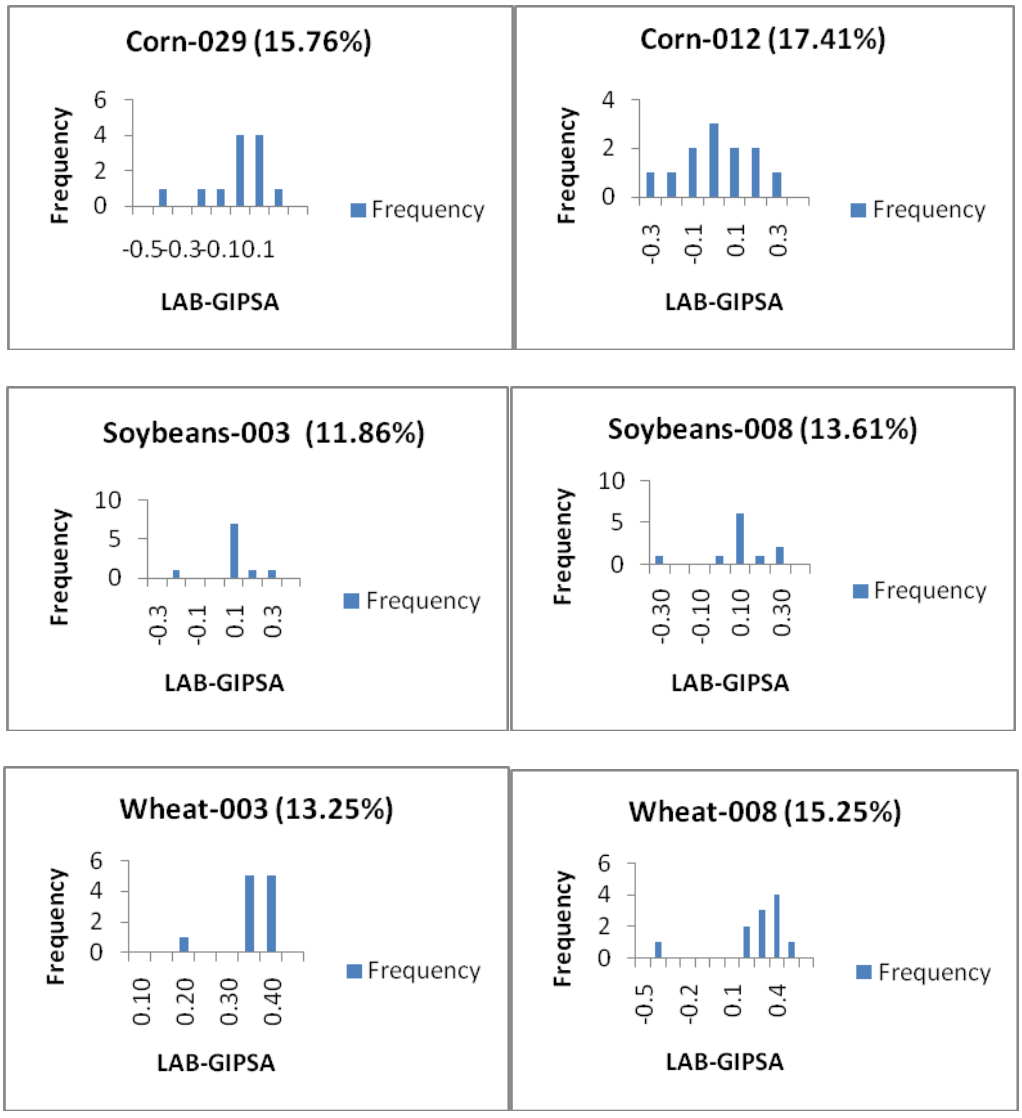
Discussion: Mr. Karl Cunningham reported that 14 laboratories participated in this study. Participants included: USDA/GIPSA (as reference laboratory), Arkansas, Colorado, Illinois, Iowa, Maryland, Mississippi, Missouri, North Carolina, South Carolina, Wisconsin (corn only), Wyoming, and DICKEY-john. Perten was sent samples but did

not return results. With the exception of one or two outliers, results were fairly good. The histograms below show the distribution of lab error (participant lab result minus reference lab result) for each of the grain samples. A more detailed analysis of results will be distributed at a later date.

The Sector agreed that when detailed results are distributed, participants should not be identified by name (except for USDA/GIPSA.) Individual participants will be told which laboratory number they were assigned (e.g., you are lab #4.)

In response to the question if a collaborative air oven study was something that should be scheduled to happen on a regular basis, Mr. Cunningham suggested that every two years might be appropriate.

Dr. Hurburgh, Iowa State University, urged the representatives from the American Oil Chemists Society (AOCS) to prepare a proposal so that the collaborative study could be conducted on an on-going basis rather than on an ad hoc basis. He cautioned that the proposal would have to include corn and wheat, as well as soybeans.



9. Item 310-1: G-S.8. Provision for Sealing Electronic Adjustable Components, G-S.8.1. Access to Calibration and Configuration Adjustments, and G-S.8.2. Automatic or Semi-automatic Calibration Mechanism

Background: At its 2007 Annual Meeting, the SWMA received a proposal to add requirements to G-S.8. to assure that a device could not be sealed in the configuration mode and continue to operate normally. Such a condition could facilitate fraud. The proposal, as submitted, required that a device continuously indicate when access to the set-up mode was not disabled.

At the 2008 Interim Meeting, the S&T Committee reviewed comments received during the open hearing and discussed alternate proposals provided by WMD and SMA. At the 2008 Annual Meeting, the WMD suggested that the S&T Committee amend the recommendation to address some of the concerns noted by the CWMA, NTEP participating laboratories, and WMD since the 2008 Interim Meeting.

During the open hearings at the 2009 Interim Meeting, WMD stated that it had received comments questioning how the application of a physical seal, as recommended by the manufacturer and listed on the CC, ensures that the calibration and configuration modes are disabled. What does that presence of the physical seal, pressure sensitive or lock and wire, due to the device that disables the calibration and configuration modes?

The S&T Committee agreed with the comments that the proposal ***is not ready*** to become a Voting item and suggested that further development to the proposal addresses the following concerns:

1. Avoid language that allows the indication of usable metrological values while in the adjustment mode for devices that do not have an event logger.

2. Recognize that more than one method of sealing is acceptable on a single device, such as using a lock and wire seal, for the mechanical adjustments and an audit trail for electronic adjustments.

3. Recognize that other codes in HB 44 do not have language for device categories and corresponding methods of sealing.

4. Require an obvious indication when a device is being adjusted if it is provided with a physical security seal.

5. Clarify that the application of a physical security seal to a specially designed and sealable plate or cover that disables external access to the configuration and adjustment mode is not the only method to seal adjustable components.

Consequently, the S&T Committee recommended that this item remain Informational.

After the 2009 Interim Meeting, the NIST Technical Advisor developed the following language for further development by the regional weights and measures associations, NTETC sectors, and other interested parties with the intent that a revised proposal can be forwarded to the S&T Committee for consideration at the 2010 NCWM Interim Meeting.

> ***G-S.8. Provision for Sealing Electronic Adjustable Components.*** *– A device shall be designed with provision(s) for****:*** ~~***applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism.***~~
>
> ***(a) applying a physical security seal that must be broken, or***

(b) using other approved means of providing security (e.g., data change audit trail available at the time of inspection)

before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism.
[Nonretroactive as of January 1, 1990]

(Amended 201X)

A device may be fitted with an automatic or a semi-automatic calibration mechanism. This mechanism shall be incorporated inside the device. After sealing, neither the mechanism nor the calibration process shall facilitate fraud.

(Added 1985) (Amended 1989 and 1993)

G-S.8.1. Multiple Weighing or Measuring Elements that Share a Common Provision for Sealing. **- (Unchanged)**

G-S.8.2. Multiple Sealing Methods. – Weighing and measuring devices may be approved for use with multiple methods for sealing adjustable components such as physical seals for calibration adjustment (e.g., load cells, meters, etc.) and event counters or event logger for the configuration parameters (e.g., capacity, interval size, octane blend settings, etc.).
[Nonretroactive as of January 1, 201X]

(Added 201X)

G S.8.3. Adjustment Mode Indications. – During the calibration and configuration adjustment mode, the device shall:

(a) Not provide metrological indications that can be interpreted, or transmitted into memory, or printed while it is in the calibration and/or configuration adjustment mode as a correct measurement value, or

(b) Clearly and continuously indicate that it is in the calibration and/or configuration adjustment mode, and record such message if capable of printing in this mode.

Nonretroactive as of January 1, 201X)

(Added 201X)

Discussion: The proposed changes to **G-S.8.** and the proposed language of **G-S.8.2.** do not appear to affect the provisions for sealing GMMs and NIR Grain Analyzers (see **HB 44, Section 5.56.(a)**, paragraph **S.2.5. Provision for Sealing** and **HB 44 Section 5.57**., paragraph **S.2.6. Provision for Sealing.)** The requirements of **G-S.8.3.**, however, may affect some instruments. This proposal stipulates that during any adjustment mode, the device must either not provide any metrological result that could be interpreted as a correct measurement, or must clearly and continuously indicate that it is in the adjustment mode.

In response to a request for feedback from manufacturers on the proposed changes and additions to **G-S.8.3**, Mr. Sean Bauer, Steinlite, described how the SL95 seals a switch that gives access to "adjustment mode". A wire seal must be broken to slide the switch to "adjustment mode" position. The device cannot be re-sealed without returning the switch to normal "operate" position. In "operate" position, the user cannot access "adjustment mode". Mr. Truex, NTEP Administrator, offered the opinion that this sort of arrangement sounded as if it would meet the requirements of option (a) of the proposal. He mentioned that some devices display CAL OPEN or CON OPEN continuously whenever the device is in adjustment mode to comply with option (b) of the proposal.

During a discussion of **G-S.8. Provision for Sealing Electronic Adjustable Components**, and use of a data change audit trail as a method of sealing, there was some concern that the two Grain Analyzer chapters of Publication 14 might contain wording that allows certain manufacturer/service company adjustments to be excluded from the audit trail. A cursory examination of Pub 14 did not reveal any obvious exclusions.

The Co-technical Advisor suggested that the GMM and NIR grain analyzer code of HB44 appears to cover the proposed changes to **G-S.8., G-S.8.2**, however, **Table S.2.5. Categories of Device and Methods of Sealing** in the GMM code may require some minor changes to expand the meaning of remote configuration capability to include the ability of the device to accept a new memory chip or to accept new parameters from anything plugged into a universal serial bus (USB) port or other port.

[Note the following definitions from **Appendix B - Philosophy for Sealing** in the GMM Chapter of Publication 14.]

> **Remote configuration capability.**
> The ability to adjust a weighing or measuring device or change its sealable parameters from or through some other device that is not itself necessary to the operation of the weighing or measuring device or is not a permanent part of that device.
>
> **Remote device.**
> A device that (1) is not required for the measurement operation of the primary device or computing the transaction information in one or more of the available operating modes for commercial measurements or (2) is not a permanent part of the primary device. In the context of this paper, a remote device has the ability to adjust another device or change its sealable configurable parameters.

The Sector decided to make this a carryover item for the next meeting so it could be studied in more depth.

9.5 Properly Standardized Reference Meters

[Submitted by Mr. Karl Cunningham, Illinois Department of Agriculture; received after the formal Agenda was published.]

The State of Illinois is requesting a definition for properly standardized reference meter and what the requirements are to qualify a meter as such. As with all standards there must be traceability. What criteria must these reference meters" meet? Also, for non-NTEP meters the testing procedure allows for air-oven testing to be performed, not meter to like-meter testing. What suggestions does the sector have on traceability of grain standards?

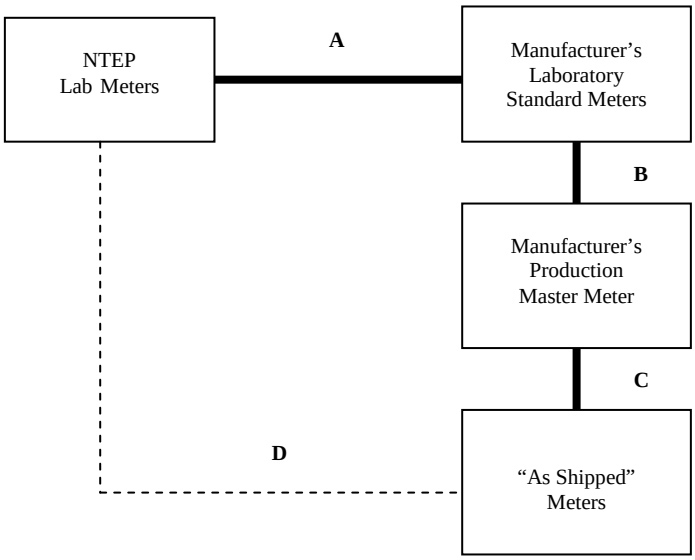
Background and Discussion:
[Note: The Illinois Bureau of Weights and Measures licenses companies and individuals who sell, install, or repair commercially used weighing and measuring devices through the Registered Serviceperson Program. Before becoming licensed, servicepersons are examined on their proficiency and understanding of applicable regulations. Licenses must be renewed annually. A registered serviceperson in good standing may place a commercially used device into service and the device may be used in trade or commerce until a state test is performed. Anyone who sells, installs, services, reconditions, or repairs a commercially used weighing or measuring device must be registered with the Illinois Department of Agriculture. On the bureau's list of Registered Repair Companies, eight are classified as registered to service moisture meters. Two of these companies carry the note "Sell only." Whenever a GMM has been serviced **or has had updated grain calibrations installed**, the meter must be "returned to service" by a registered serviceperson before it can be used. It is still subject to later inspection by Illinois Weights and Measures personnel.]

This item originated because the State of Illinois is concerned that some of its Registered Service Companies do not have the required procedures or equipment to comply with Handbook 44 test requirements when placing meters back into service.

For NTEP meters HB 44 permits meter to like-meter testing using "properly standardized reference meters …." Mr. Cunningham asked, "What is the definition of a properly standardized reference meter? How are they maintaining these standardized reference meters to know that they are operating properly and accurately?"

He was referred to **Section VI. Standardization of Instruments** in the GMM chapter of Publication 14 that shows the relationship and maximum permissible errors between the NTEP Lab meters, Manufacturer's Laboratory Standard Meters, Manufacturer's Production Master Meter, and "As Shipped" meters. It was explained that a

properly standardized reference meter for a Service Company should have the same traceability to the NTEP Lab Meters as the Manufacturer's Production Master Meter has.



Ms. Eigenmann explained how DICKEY-john checks and maintains the traceability required by Publication 14. DICKEY-john has three Laboratory Standard Meters that never leave the moisture laboratory. In the factory they have production line standards corresponding to the "Manufacturer's Production Master Meter shown in the above diagram. Once a month the production line standards are brought into the laboratory and checked against the three lab instruments. Six drops of grain are run though each of the four meters. This is done in a sequence that minimizes the effect of any moisture loss in the grain being used. Averages and standard deviations are calculated, and several other comparison tests are performed. The mean moisture difference between the Laboratory Standard Meters and a Production Line Standard (path B in the diagram) must not exceed 0.08 % moisture. Similarly, remote service locations bring their working standards to the DICKEY-john moisture laboratory once a year for the same kind of checks that are given to production line standards.

It was pointed out that there was no way to standardize a non-NTEP meter to the NTEP Laboratory Standard Meters. This is why HB44 requires that grain samples with air-oven moisture values be used for testing non-NTEP meters. Mr. Cunningham was concerned that there were service agencies and manufacturer's dealers who were placing non-NTEP meters into service without using air-oven samples. He thought that this was going to be another issue for these service companies, because they were going to be required to have air-oven capability or to show how they can obtain air-oven samples for putting non-NTEP meters back into service.

Mr. Tom Runyon, Seedburo Equipment Company, expressed the opinion that it is not reasonable to expect some dealers working out of their home, especially those not doing any repair work, to have air-oven capabilities rather they only need a set of air-oven samples. Dr. Hurburgh suggested that Illinois could offer a service supplying state certified air-oven samples for use by a registered service company to verify that a meter meets the accuracy requirements of HB 44 when it places a meter back into service. The State could require the service company to use a monitor meter and maintain a log of initial moisture and results of periodic monitor meter checks, just as Illinois inspectors do.

10. Time and Place for Next Meeting

The next meeting is tentatively planned for Wednesday, August 25 and Thursday, August 26, 2010, at the Chase Suites by Woodfin at Kansas City International Airport in Kansas City, Missouri. Sector members are asked to hold these days open pending determination of agenda items, exact meeting times, and meeting duration. Final meeting details will be announced by early June 2010.

If you would like to submit an agenda item for the 2010 meeting, please contact any of the following persons by June 1, 2010.

Mr. Jim Truex, NTEP Administrator, jim.truex@ncwm.net
Ms. G. Diane Lee, NIST Technical Advisor, diane.lee@nist.gov
Mr. Jack Barber, Technical Advisor, barber.jw@comcast.net

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