National Type Evaluation Technical Committee (NTETC)
Grain Analyzer Sector Meeting Agenda

August 21-22, 2013 / Kansas City, Missouri

INTRODUCTION

The charge of the NTETC Grain Analyzer Sector is important in providing appropriate type evaluation criteria based on specifications, tolerances and technical requirements of *NIST Handbook 44* Sections 1.10. General Code, 5.56. Grain Moisture Meters and 5.57. Near-Infrared Grain Analyzers. The sector's recommendations are presented to the National Type Evaluation Program (NTEP) Committee each January for approval and inclusion in *NCWM Publication 14 Technical Policy, Checklists, and Test Procedures* for national type evaluation.

The sector is also called upon occasionally for technical expertise in addressing difficult *NIST Handbook 44* issues on the agenda of National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors, and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

Suggested revisions are shown in **bold face print** by ~~**striking out**~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be nonretroactive are printed in ***bold faced italics***.

Table A
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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
BIML	International Bureau of Legal Metrology	NTETC	National Type Evaluation Technical Committee
CD	Committee Draft	OCP	Ongoing Calibration Program
CIML	International Committee of Legal Metrology	OIML	International Organization of Legal Metrology
CIPM	International Committee of Weights and Measures	OWM	Office of Weights and Measures
D	Document	R	Recommendation
EMRP	European Metrology Research Program	S&T	Specifications and Tolerances
FGIS	Federal Grain Inspection Service	SC	Subcommittee
GA	Grain Analyzer	SD	Secure Digital
GIPSA	Grain Inspection, Packers and Stockyards Administration	TC	Technical Committee
GMM	Grain Moisture Meter	TW	Test Weight
MRA	Mutual Recognition Agreement	UGMA	Universal Grain Moisture Algorithm
NCWM	National Conference on Weights and Measures	USB	Universal Serial Bus
NIR	Near Infrared Grain Analyzer	USDA	United States Department of Agriculture
NIST	National Institute of Standards and Technology	USNWG	United States National Working Group
NTEP	National Type Evaluation Program		

Details of All Items
(In order by Reference Key)

1. Report on the 2013 NCWM Interim and Annual Meetings

The 2013 NCWM Interim Meeting was held January 27-30, 2013 in Charleston, South Carolina. At that meeting, no recommended amendments to Publication 14 for grain analyzers were provided to the NTEP committee. Several of the recommended changes to Publication 14 that were discussed at the 2012 Sector meeting were pending voting at the 2013 annual meeting and will be reviewed later in agenda item 4 as proposed changes to the 2013 edition of Publication 14.

The 2013 NCWM Annual Meeting was held July 14-18, 2013 in Louisville, Kentucky. There were two Grain Analyzer Sector Voting Items on the agenda. **Item 356-1, Table S.2.5. Categories of Device and Methods of Sealing** and **Item 356-2, UR.3.4. Printed Tickets.** See Grain Analyzer Agenda Item 4, and Agenda Item 5 below, for details. There was also one Grain Analyzer Sector Developing item on the S&T agenda. **Item 360-7, Appendix D – Definitions: Remote Configuration Capability.** See Grain Analyzer Agenda Item 6, below, for details.

Mr. Jim Truex, NTEP Administrator, will report on the status of these three items.

2. Report on NTEP Evaluations and Ongoing Calibration Program (OCP) (Phase II) Testing

Ms. Cathleen Brenner, Grain Inspection, Packers and Stockyards Administration (GIPSA), the NTEP Participating Laboratory for Grain analyzers will bring the sector sector up to date on NTEP Evaluation (Phase I) activity. She will also report on the collection and analysis of Grain Moisture Meter OCP (Phase II) data on the 2012 crop. Ms. Brenner will identify, for the 2013 harvest, the models enrolled in Phase II.

3. Review of OCP (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, GIPSA, the NTEP Participating Laboratory for Grain analyzers will present data showing the performance of NTEP meters compared to the air oven. This data is based on the last three crop years (2010–2012) using calibrations updated for use during the 2013 harvest season. The 2010-2012 Grain Moisture Meter (GMM) Phase II comparison graphs are available for view or can be downloaded for printing at the following web address:

http://www.ncwm.net/resources/dyn/files/1081743z9820e9b2/_fn/GMMBiases13.pdf

4. Amend Table S.2.5. of §5.56.(a) in NIST Handbook 44 - Update

Source:
NTETC Grain Analyzer Sector

Purpose:
Delete "remotely" from the second paragraph of Category 3 requirements that begins, "When accessed remotely …" to make it clear that the requirements of Category 3 apply whether accessed manually using the keyboard or accessed by remote means, and add the modified second paragraph of Category 3 requirements to Categories 3a and 3b to make it clear that these requirements apply to all the subcategories of Category 3. At the 2013 Annual meeting, S&T item 356-1, amendments to Table S.2.5. of §5.56.(a) in NIST Handbook 44 as noted in the item under consideration below, were adopted.

Item Under Consideration:

Table S.2.5. ***Categories of Device and Methods of Sealing***	
Categories of Device	***Methods of Sealing***
Category 1: *No remote configuration capability.*	*Seal by physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.*
Category 2: *Remote configuration capability, but access is controlled by physical hardware.* *A device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for remote configuration.*	*The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999). If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.*
Category 3: *Remote configuration capability access may be unlimited or controlled through a software switch (e.g., password).* *When accessed* ~~***remotely***~~ *for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.*	*An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants). A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to twenty-five (25) times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)*
Category 3a: *No remote capability, but operator is able to make changes that affect the metrological integrity of the device (e.g., slope, bias, etc.) in normal operation.* ***When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.***	*Same as Category 3*
Category 3b: *No remote capability, but access to metrological parameters is controlled through a software switch (e.g., password).* ***When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.***	*Same as Category 3*

[*Nonretroactive as of January 1, 1999* ***and January 1, 201X***]
(Amended 1998 **and 201X**)

Note: Zero-setting and test point adjustments are considered to affect metrological characteristics and must be sealed.

(Added 1993) (Amended 1995 and 1997)

Background / Discussion:
All of the GMMs in Categories 3, 3a, and 3c of Table S.2.5. use an electronic method of sealing, and most of them also offer access to the configuration mode thorough a keyboard entered password. In this mode, sealable parameters can also be changed locally through the keyboard. Category 3 of Table S.2.5. currently includes the following requirement:

> When accessed remotely for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measuring mode.

At its 2011 Grain Analyzer Sector Meeting the sector agreed by consensus that the following changes to Table S.2.5. of §5.56.(a) of *NIST Handbook 44* should be forwarded to the S&T Committee for consideration:

- Add a note to Table S.2.5. to recognize the expanded scope of "remote capability".
- Delete "remotely" from the second paragraph of Category 3 requirements that begins, "When accessed remotely …" to make it clear that the requirements of Category 3 apply whether accessed manually using the keyboard or accessed by remote means.
- Add the modified second paragraph of Category 3 requirements to Categories 3a and 3b to make it clear that these requirements apply to all the subcategories of Category 3.

At the suggestion of National Institute of Standards Technology (NIST), Office of Weights and Measures (OWM), the Table S.2.5. changes approved by the sector in 2011 have been separated into two independent items: one dealing with the changes to Category 3 and its subcategories (as shown in Item Under Consideration) and one dealing with the modification of the definition of remote configuration capability appearing in Appendix D of *NIST Handbook 44* to recognize the expanded scope of "remote capability". This independence insures that one item will not hold up the other from consideration.

At the 2013 Annual meeting, S&T item 356-1, amendments to Table S.2.5. of §5.56.(a) in NIST Handbook 44 as noted in the item under consideration above, were adopted. With the adoption of the amendments to Table S.2.5 the following related changes will be made to both the GMM Chapter and the Near Infrared (NIR) Grain Analyzer Chapter of *NCWM Publication 14*. These changes are shown in Items 4(a), 4(b), and 4(c) following:

4.a. Proposed Changes to Table S.2.5. in Appendix C of the GMM Chapter of Publication 14

Table S.2.5. Categories of Device and Methods of Sealing

Categories of Device		Method of Sealing
Category 1:	No remote configuration capability	Seal by physical seal or two event counters: one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999.) If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.
Category 2:	Remote configuration capability, but access is controlled by physical hardware. Device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for remote configuration.	The hardware enabling access for remote communication must be at the device and sealed using a physical seal or two event counters; one for calibration parameters (000 to 999) and one for configuration parameters (000 to 999.) If equipped with event counters, the device must be capable of displaying, or printing through the device or through another on-site device, the contents of the counters.
Category 3:	Remote configuration capability, access may be unlimited or controlled through	An event logger is required in the device; it must include an event counter (000 to 999), the parameter ID, the date

	a software switch (e.g. password.) When accessed ~~**remotely**~~ for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measure mode.	and time of the change and the new value of the parameter (for calibration changes consisting of multiple constants, the calibration version number may be used rather than the calibration constants.) A printed copy of the information must be available through the device or through another on-site device. The event logger shall have a capacity to retain records equal to twenty-five (25) times the number of sealable parameters in the device, but not more than 1000 records are required. (Note: Does not require 1000 changes to be stored for each parameter.)
Category 3a:	No remote capability, but operator is able to make changes that affect the metrological integrity of the device (e.g. slope, bias, etc.) in normal operation. **When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measure mode.**	Device shall clearly indicate that it is in the remote configuration mode and shall not be capable of operating in the measure mode while enabled for remote configuration.
Category 3b:	No remote capability, but access to metrological parameters is controlled through a software switch (e.g. password.) **When accessed for the purpose of modifying sealable parameters, the device shall clearly indicate that it is in the configuration mode and shall not be capable of operating in the measure mode.**	Remote configuration capability, access may be unlimited or controlled through a software switch (e.g. password.)

*Non-retroactive as of January 1, 1999. Amended 1998 **and 201X***

4.b. Proposed Changes to the Checklist of the GMM chapter of Publication 14

For Category 3 Devices

4.6.36. If a measurement is in process when the device is accessed ~~**remotely**~~ for the purpose of modifying sealable parameters, the measurement is either: ☐ Yes ☐ No ☐ N/A

- Terminated Before Results can be Displayed or Printed. **OR**
- Completed Before Entering the Configuration Mode

4.6.37. When accessed ~~**remotely**~~ for the purpose of modifying sealable parameters, the device clearly indicates that it is in the configuration mode and is not capable of operating in the measure mode. ☐ Yes ☐ No ☐ N/A

4.6.37.1 Describe the method used to seal the device or access the audit trail information:

_____

_____

4.c. Proposed Changes to the Checklist of the NIR Grain Analyzer Chapter of Publication 14

Near Infrared (NIR) Grain Analyzers use an electronic method of sealing similar to those of GMMs, and most of them also offer access to the configuration mode thorough a keyboard entered password. In this mode, sealable parameters can be changed locally through the keyboard. At the 2011 NTETC Graina Analyzer Sector Meeting the sector agreed that contingent upon acceptance of Item Under Consideration the NIR Check List of *NCWM Publication 14* should be modified to delete "remotely" from §4 Design of NIR Analyzers, ¶ 4.9.16 as shown below.

4.9.16. If a measurement is in process when the device is accessed ~~**remotely**~~ for the purpose of modifying sealable parameters, the measurement is either:

4.9.16.1 Terminated Before Results can be Displayed or Printed. **OR** ☐ Yes ☐ No ☐ N/A

4.9.16.2 Completed before entering the configuration mode ☐ Yes ☐ No ☐ N/A

4.9.16.3 Describe the method used to seal the device or access the audit trail information:

_____

_____

5. Item 356-1 Printed Ticket User Requirements – Update

Source:
Grain and Feed Association of Illinois (2012)

Purpose:
Change the mandatory printing of tickets from grain moisture meters to an "on demand at the time of transaction" printing and remove the requirement of printing the calibration version identification. Note that the S&T Committee did not agree with proposed removal of the requirement to print the calibration version identification; this position is reflected in the version of the proposal currently under consideration by the committee. This item was adopted at the 2013 NCWM Annual meeting.

Item Under Consideration:
Amend *NIST Handbook 44*, Grain Moisture Meter Code 5.56.(a) as follows:

UR.3.4. Printed Tickets.

(b) The customer shall be given a printed ticket **at the time of the transaction or as otherwise specified by the customer.** The printed ticket shall include ~~**showing**~~ the date, grain type, grain moisture results, and test weight per bushel, and calibration version identification. The ticket **information** shall be generated by the grain moisture meter system.

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(Amended 1993, 1995, ~~**and**~~ 2003, **and 2013**)

Background:
According to the submitter, the user requirement to provide a printed ticket for every single load is unrealistic in the country elevator industry. Traffic patterns at country elevators do not lend themselves to providing a printed ticket to all customers and customers really don't want them. As the speed and capacity increases in the industry, outbound scales are being located at a distance from the inbound scale and the scale house where the moisture tester is located to alleviate traffic bottlenecks. When the outbound scale is located away from where the ticket is printed, the truck driver must circle back around to pick up the ticket, thus, causing logistical problems. In addition, since meters are sealed, inspected and required to have the correct calibration, there is no need for the calibration version identification to be printed on the ticket. Also, most customers are not going to know if it is the correct calibration version identification or not. There have been problems getting the information from the grain moisture meter to the grain accounting system – especially the calibration version identification. Some grain accounting systems have to be "hard coded" for calibration version identification which must be changed whenever the calibration changes. The change will be at an added cost for the industry.

When a consumer pays at a gas pump, they have the option of a receipt on demand at the time of transaction or not receiving a receipt. There would be a cost savings to moisture meter users as they would save on paper and filing space, and in the situation where the calibration version identification is "hard coded," there will be a cost savings of the expense to have the grain accounting software provider make those changes.

Since moisture meters are capable of printing the ticket, some would argue that they should just go ahead and print them and provide them to the customer. In addition, the requirement does not say when the ticket shall be given to the customer; thus, the printed tickets could be saved for weeks, months, or even years in case the customer had a concern at some point. Printing the calibration version identification ensures the correct calibration is being used.

The submitter proposed amendments to paragraph UR.3.4. Printed Tickets as follows:

UR.3.4. Printed Tickets.

(b) The customer shall be given a printed ticket on **demand at the time of the transaction** showing the date, grain type, grain moisture results, **and** test weight per bushel~~**, and calibration version identification**~~. The ticket **information** shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~**and**~~ 2003, **and 20XX**)

At the 2011 Central Weights and Measures Association (CWMA) Interim Meeting some jurisdictions opposed the proposal citing that it is a fundamental element of a point of sale transaction that there is either a witness to the transaction or that a receipt is made available. Others supported the item and recognized that many customers refuse to take the printed tickets. The CWMA believes that the calibration version identification is not necessary on the ticket since most jurisdictions are already verifying the calibrations version when the device is inspected. This proposal is not eliminating the opportunity for the seller to obtain a printed ticket. The CWMA forwarded the item to NCWM, recommending it as a Voting Item.

At the 2011 Western Weights and Measures Association (WWMA) Annual Meeting the committee heard no comments on this item. The WWMA amended the proposal to make the language consistent with other codes such as 3.32. LPG and Anhydrous Ammonia Liquid-Measuring Devices Code paragraph UR.2.6. Ticket Printer: Customer Tickets. The WWMA forwarded the modified version below to NCWM, recommending it as a Voting Item.

UR.3.4. Printed Tickets.

(b) The customer shall be given a printed ticket ~~showing~~ at the time of the transaction or as otherwise specified by the customer. The printed ticket shall include the date, grain type, grain moisture results, and test weight per bushel, ~~and calibration version identification~~. The ticket information shall be generated by the grain moisture meter system.

(Amended 1993, 1995, ~~**and**~~ 2003, **and 20XX**)

At the 2011 Northeastern Weights and Measures Association (NEWMA) Interim Meeting there were no comments. Deferring to the expertise of the NTETC Grain Analyzer Sector, NEWMA forwarded the item to NCWM, recommending it as a Developing Item.

At the 2011 Southern Weights and Measures Association (SWMA) Annual Meeting, Ms. Butcher, NIST Technical Advisor, noted that the proposed language submitted was slightly different from that discussed by the NTETC Grain Analyzer Sector and provided a summary corresponding to this item prepared by Ms. Lee, Grain Analyzer Sector Technical Advisor. Ms. Butcher also pointed out that WWMA proposed alternate language that is consistent with printed tickets requirements in other codes. The SWMA agreed that the customer should be given the option of receiving a printed ticket from a transaction and that the proposed changes would clarify the responsibility of the device user. The SWMA preferred the option forwarded by WWMA since it mirrors existing language in other

NIST Handbook 44 codes. The SWMA forwarded the item to NCWM, recommending it as a Voting Item as revised by WWMA.

At the 2012 NCWM Interim Meeting, the S&T Committee received comments in support of the alternative language submitted by the WWMA. NIST, OWM reported that the proposed language submitted to the regional weights and measures associations was different from that agreed to by the Grain Analyzer Sector at its August 2011 meeting. The Grain Analyzer Sector had specifically opposed deleting the phrase "calibration version identification." NIST, OWM also noted that not all grain moisture meters are Category 3 devices; consequently, calibration version identification information is a critical component on the printed receipt to reconstruct the basis for a sale and help officials to resolve complaints.

The committee agreed that the version proposed by WWMA and SWMA was preferable since it mirrors similar language in other *NIST Handbook 44* Codes. The committee also agreed that, given the Grain Analyzer Sector's opposition to deleting the reference to "calibration version identification," this phrase should be retained in the paragraph. The committee presented an amended version of the proposal. The committee recognized that the regional associations were not aware of the sector's position on the proposed deletion of the reference to the calibration version and that the submitter has not had an opportunity to review the significant changes from the original version. The 2012 S&T Committee designated this item as an Informational Item to allow additional opportunity for input.

At the Sector's August 2012 meeting one member suggested that the phrase "or as otherwise specified by the customer" be modified to read "or as agreed to by the customer". Customers are not going to proactively specify how elevator record keeping systems are put together, but they can agree that this information comes on a settlement sheet. A contract for the sale of grain at some future date with XYZ Grain contains a phrase that the seller agrees to XYZ Grain's various transaction policies. By signing the contract, the seller agrees to accept settlement sheet information via a web listing that can be accessed with a computer or possibly using a smart phone. The seller is not "specifying" how he wants to receive the "ticket" information, he is just "agreeing" to receive it in a different manner.

The wording proposed by the Sector in 2011, "A printed ticket shall be made available to the customer upon request at the time of transaction…" did not require the customer to do anything if he didn't want a ticket, but it did require him to ask for one if he wanted one. The wording in the Item under Consideration required the customer to say, "I don't want a ticket ...." if a ticket wasn't wanted. If he said nothing, he would be given a ticket (or offered one).

Other Sector members felt that the wording of the Item under Consideration allowed flexibility, and most were in favor of accepting the Item under Consideration. An attempt to obtain a consensus on the S&T Committee's proposal was unsuccessful due to one jurisdiction's belief that …"a ticket is given to the customer no matter what."

There was further discussion on whether the wording in the Item under Consideration, "….. at the time of the transaction or as otherwise specified by the customer" means that the customer gets a ticket at the time of transaction or at a later specified time. Some believed that "as otherwise specified by the customer" could mean "Never" or "in another form". Sector Chairman, Ms. Cassie Eigenmann, DICKEY-john, Corp., reminded the Sector that the reason Illinois Grain & Feed Association submitted the request for change was because they did not want to have to print a ticket at the time of transaction unless the customer requested one at the time of transaction.

It was pointed out that unless a ticket is printed by the GMM before the grain sample is "dumped" from the GMM it may not be possible for the GMM to print a ticket for that transaction. The information, however, could reside in the memory of the elevator's grain transaction system and could be printed in another form e.g., on a settlement sheet that is sent (or transmitted) to the seller later. Further discussion suggested that the S&T proposed wording could be interpreted to mean that elevators that captured GMM information in their grain transaction system at the time of transaction would not have to supply a GMM printed ticket at time of transaction unless requested by the customer at time of transaction. If the elevator is using a GMM that is equipped to record and that was put into service **before** January 1, 1998, the elevator would be required to give the customer a printed ticket at the time of transaction (need print only percent moisture content and grain selected).

At the 2012 Grain Analyzer Sector meeting, the sector agreed in a vote of 9 in favor and 1 opposed to the item under consideration.

WWMA received no comments on this item at its 2012Annual Meeting. The WWMA believed the intent in the amended proposed language is similar to other codes in HB 44 and sufficiently gives options of how printed tickets are provided to the customer. WWMA supported the item and recommended that it be a Voting Item.

NEWMA supported this item as a "Voting" item at both its 2012 Interim Meeting and 2013 Annual Meeting.

The SWMA received no comments at its 2012 Annual Meeting. The Committee recognized that the NCWM S&T Committee designated this as an Information Item to allow additional time for the weights and measures community, including the original submitter to review the changes made to the proposal during the 2012 NCWM Interim Meeting. The Committee believes that adequate time has elapsed to allow for comment. The Committee noted that the NTEP Grain Sectors have also reviewed the proposal, as modified, and have expressed no opposition. SWMA recommended that the item be a Voting Item.

During its Open Hearings at the 2013 NCWM Interim Meeting, the Committee heard comments from Ms. Juana Williams (NIST OWM) who noted that OWM believes the suggested changes to UR.3.4. Printed Tickets are appropriate and notes that the language is similar to other codes in NIST Handbook 44. OWM agrees with the Grain Analyzer Sector's decision to retain the requirement for recording the "calibration version identification." OWM notes that while "Category 3" devices would require the printing of the calibration version identification information, not all grain moisture meters are "Category 3" devices. Having this information printed on receipts provides customers and officials with the means to verify that correct calibration settings are being used for a given transaction. The Committee received no other comments on this item. Hearing no opposition to the proposed changes, the Committee agreed to recommend the proposal for a vote.

On the 2013 NCWM Online Position Forum, one Government representative opposed the proposal, with no additional comments. During Open Hearings at the 2013 NCWM Annual Meeting, the Committee heard no comments in opposition to this item. NIST OWM reiterated its comments from the 2013 Interim Meeting. The item under consideration was adopted at the 2013 NCWM Annual Meeting.

6. Modify the Definition of Remote Configuration Capability Appearing in Appendix D of NIST Handbook 44 to Recognize the Expanded Scope of "Remote Configuration Capability" (S&T Developing item 360-7)

Source:
NTETC Grain Analyzer Sector

Purpose:
Table S.2.5. *Categories of Device and Methods of Sealing* that appears in §5.56.(a) of *NIST Handbook 44* lists acceptable methods of sealing for various categories of GMMs. When the sector first recommended adding the table to *NIST Handbook 44* at their September 1996 meeting, the concept of making a change to a GMM from a remote site involved information " …sent by to the device by modem (or computer)." In 2011 this concept has expanded to include the ability of the measuring device to accept new or revised sealable parameters from a memory chip (e.g., an SD Memory Card that may or may not itself be necessary to the operation of the device), external computer, network, or other device plugged into a mating port (e.g., Universal Serial Bus (USB) port) on the measuring device or connected wirelessly to the measuring device. The changes proposed in Item Under Consideration expand the scope of "remote configuration capability" to cover instances where the "other device" may be necessary to the operation of the weighing or measuring device or which may be considered a permanent part of that device.

Item Under Consideration:

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**~~ **may or may not** itself **be** necessary to the operation of the weighing or measuring device or ~~**is not**~~ **may or may not be** a permanent part of that device.[2.20, 2.21, 2.24, 3.30, 3.37, 5.56(a)]

(Added 1993, **Amended 20XX**)

Background / Discussion:
Two common types of removable data storage devices are the USB flash drive and the Secure Digital (SD) memory card. A USB flash drive is a data storage device that includes flash memory with an integrated USB interface. USB flash drives are typically removable and rewritable, and physically much smaller than a floppy disk. A SD card is a non-volatile memory card format originally designed for use in portable devices. The SD standard is maintained by the SD Card Association.

Removable digital storage devices can be used in GMMs as either "data transfer" devices which are not necessary to the operation of the GMM or as "data storage devices" which are necessary to the operation of the GMM.

A USB flash drive is most likely to be used as a "data transfer" device. In a typical "data transfer" application, the USB flash drive is first connected to a computer with access to the web. The computer visits the GMM manufacturer's web site and downloads the latest grain calibrations that are then stored in the USB flash drive. The USB flash drive is removed from the computer and plugged into a USB port on the GMM. The GMM is put into "remote configuration" mode to copy the new grain calibration data into the GMM's internal memory. When the GMM has been returned to normal operating (measuring) mode the USB flash drive can be removed from the GMM.

Although an SD memory card could also be used as a "data transfer device" it is more likely to be used as a "data storage device". In a typical "data storage device" application, the SD memory card stores the grain calibrations used on the GMM. The SD memory card must be plugged into an SD memory card connector on a GMM circuit card for the GMM to operate in measuring mode. To install new grain calibrations the GMM must be turned "off" or put into a mode in which the SD memory card can be safely removed. The SD memory card can either be replaced with an SD memory card that has been programmed with the new grain calibrations or the original SD memory card can be re-programmed with the new grain calibrations in much the same way as that described in the preceding paragraph to copy new grain calibrations into a USB flash drive. In either case, the SD memory card containing the new calibrations must be installed in the GMM for the GMM to operate in measuring mode. In that regard, the SD memory card) can be considered a "permanent part" of the GMM in that the GMM cannot operate without it.

Note: In the above example "SD memory card" could be any removable flash memory card such as the Secure Digital Standard-Capacity, the Secure Digital High-Capacity, the Secure Digital eXtended-Capacity, and the Secure Digital Input/Output, which combines input/output functions with data storage. These come in three form factors: the original size, the "mini" size, and the "micro" size. "Memory Stick" is a removable flash memory card format, launched by Sony in 1998, and is also used in general to describe the whole family of Memory Sticks. In addition to the original Memory Stick, this family includes the Memory Stick PRO, the Memory Stick Duo, the Memory Stick PRO Duo, the Memory Stick Micro, and the Memory Stick PRO-HG.

At its 2012 meeting the Grain analyzer Sector agreed by consensus to accept the Item Under Consideration and recommended forwarding this item to the S&T Committee for consideration.

2012 WWMA Annual Meeting: Ms. Juana Williams (NIST OWM) supported the intent. She talked about this item in conjunction with Item 356-1, S.2.5. Categories of Device and Methods of Sealing. This is a complex item affecting multiple other devices; therefore the proposal requires further consideration. The language in the proposal to amend the definition of remote configuration capability is confusing. The Committee believes the current definition already allows the use of remote configuration devices and allows the flexibility desired. The

ramifications of changing the definition could affect other devices in HB 44. WWMA did not forward this item to NCWM.

2012 SWMA Annual Meeting: There were no comments. After reviewing the proposal and considering the potential impact on other device types, the Committee recommended this as a Developing Item. The Committee asks that the Sector continue to obtain input on the definition and the impact the changes would have on other device types. SWMA forwarded the item to NCWM, recommending it as a Developing Item and assigning its development to the Grain Analyzer Sector.

During its Open Hearings at the 2013 NCWM Interim Meeting, the Committee heard comments from Ms. Juana Williams (NIST OWM). OWM suggests the Committee consider this item as a Developing item to allow other Sectors to discuss how a change to the definition may affect other device types of similar design and to consider changes if needed. OWM recognizes that the current definition for "remote configuration capability" may not address those grain moisture meters (GMMs) which can only be operated with a removable data storage device, containing, among other things, the grain calibrations intended for use with the GMM, inserted in the device (as was described by the Grain Analyzer Sector). As such, OWM notes that current sealing requirements were developed at a time when such technology likely didn't exist, nor could be envisioned, and are based on the current definition of remote configuration capability. Because the current definition was never intended to apply to this "next generation" technology, OWM suggests that those charged with further development of this item may wish to revisit the five philosophies of sealing and consider whether a new paragraph, completely separate from current sealing requirements, might be appropriate and a better option, than the one currently proposed. The five philosophies of sealing are included in the 1992 Report of the 77th National Conference on Weights and Measures (Report of the Specifications and Tolerances Committee). Another option, preferred over the changes currently proposed, would be to add a separate statement to the current definition of "remote configuration capability" to address removable storage devices. For example, the following sentence might be considered as an addition to the current definition for "remote configuration capability:"

> **Devices which are programmed using removable media (such as SD cards, flash drives, etc.) that may or may not be required to remain with the device during normal operation are also considered to be remotely configured devices.**

The Committee also heard comments from Dmitri Karimov (LC), speaking on behalf of the MMA, who made two points: (1) Flow computers may already have these capabilities, thus it may be more appropriate to consider adding requirements to the General Code so that the requirements will be uniformly applied to all device types; and (2) the Committee should look ahead and consider other capabilities that may or already have emerged such as wireless communication and configuration.

The Committee acknowledged the comments indicating that the current definition of "remote configuration capability" was developed at a time when certain technologies, such as blue tooth, SD storage devices, flash drives, etc., didn't exist. The Committee recognized that it may be difficult to modify the existing definition and associated requirements to be flexible enough to address emerging and future technologies without having a significant (and possibly detrimental impact) on existing devices. Consequently, rather than modifying the current definition, the Committee concluded that a better approach might be to develop an entirely separate set of security requirements that would apply to emerging technologies. The Committee believes that additional work is needed to develop proposed definition(s) and associated requirements and decided to designate the item as Developmental. The Committee requests other Sectors review the Grain Sector's proposed modification to the definition as well as OWM's suggestions and provide input.

At their 2013 Annual Meetings, both NEWMA and CWMA supported this as a "Developing" item. NEWMA heard from NIST who encouraged members to consider this work as it applies to all device types.

On the 2013 NCWM Online Position Forum, one Government representative indicated a neutral position on this item with no additional comments.

At the 2013 NCWM Annual Meeting Open Hearings, the Committee heard comments from Juana Williams (NIST OWM) who reiterated OWM's comments from the 2013 Interim Meeting, suggesting that it may be appropriate to

develop separate requirements to address new and future technologies which can be remotely configured with removable media. OWM plans to develop draft language and ask for input from the various Sectors at their upcoming meetings. Ms. Williams also noted the suggestion made at the 2013 NCWM Interim Meeting by Dmitri Karimov, LC, speaking on behalf of the MMA, that a provision might be added to the General Code to address this type of equipment.

Julie Quinn (MN) agreed with OWM's comments and indicated support for possibly including requirements in the General Code to address newer and emerging technologies. Dmitri Karimov (LC), speaking on behalf of MMA, concurred with this suggestion.

The sector is asked to review and discuss the proposed language, and propose any additional language for changes to the definition of remote configuration capability.

7. Status of Interagency Agreement and Impact of UGMA (new GIPSA designated) Meter on Another 5-year Agreement

Source:
Cathy Brenner, USDA, GIPSA

Background/Discussion: The current Interagency Agreement is the fourth 5-year agreement of the on-going calibration program. The agreement was signed in March 2010 and runs through analysis of the 2010 crop and issuance of the 2015 Certificates of Conformance. Thus, we have just started the fourth year of the current agreement. It should be noted that annual calibration activities occur in two government fiscal years and are better defined by a starting date of July 1. The current 5-year agreement 2010-1014 is included in the table below:

Proposed NTEP On-going Calibration Program Fee Schedule For Year 2010 to 2014							
(1) Total Meters (including official meter)	(2) Meters In NTEP Pool	(3) Cost Per Pool Meter	(4) Total Program 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

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).

The GIPSA Technology and Science Division is currently seeking, and expects to obtain, Agency support for another Interagency Agreement. Challenges include a continuing government-wide emphasis on fee supported programs. We would like to complete GIPSA discussion this fall and draft a proposal for NIST consideration next spring.

Program costs are difficult to project. GIPSA recently evaluated its fee structure for evaluation testing and is in the process of evaluating fee structures for the commodity program (currently used for reference lab fees). The fee structure has a built in annual fee increase and there is discussion of building in annual fee increases for the commodity program as well. Listed below is the evaluation testing fee structure as published in the Federal Register, http://www.gipsa.usda.gov/Federal%20Register/fr13/04-15-2013a.pdf , for May 2013 through Fiscal Year 2017.

Effective Date	Hourly Rate
May 1, 2013	$87.40
October 1, 2013	$89.20
October 1, 2014	$91.00
October 1, 2015	$92.90
October 1, 2016	$94.80

On May 1, 2013, GIPSA completed the transition from the Dickey-john GAC2100 to the GIPSA UGMA master system using the Dickey-john GAC2500-UGMA and the Perten AM5200-A as the official moisture meters. GIPSA is in the early stages of determining how the program to maintain the official inspection system moisture calibrations may change due to the implementation of the UGMA technology for official moisture determinations. The NTEP

Phase II, On-going Calibration Program, is built on top of the official moisture calibration program. TSD believes that the on-going calibration program has been very successful in meeting standardization goals and is working to keep fee increases at a reasonable level as it is extremely unlikely that either NIST or GIPSA will be able to increase their support beyond the current maximum of $30,000 per year.

In order to provide the standardization services to the commercial system, GIPSA TSD is currently discussing options for improving the process and reducing the burden on all parties. GIPSA is seeking input from the sector on limiting the number of samples tested to a maximum of 10 samples per 2-percent moisture interval for all grains.

8. Near Infrared Corn NTEP Support

Source:
Cathy Brenner, USDA GIPSA `

Purpose:
When the NIR Corn constituent ranges listed in Publication 14 were created, there was a market for high oil corn. That market has changed and GIPSA is not receiving these types of samples which are needed to maintain the sample set criteria currently listed in Publication 14. In 2012, Iowa State University received some high oil corn samples from a seed company. Iowa State informed the NTEP laboratory that organic breeders are increasing oil in some specialty hybrids. The NTEP lab is working with Iowa State to obtain additional samples to try and rebuild its sample library for two complete sets of NIR Corn Accuracy.

Item Under Consideration:
The question for the sector is whether or not NCWM Publication 14 should be changed to exclude corn or change the oil constituent range in NCWM Publiation 14 from the 3 – 9 range at 0% M.B to a commodity corn oil constituent range of 3 – 5 range at 0% M.B. It should also be noted that Publication 14 includes constituent ranges and tolerances for corn starch. The NTEP laboratory has not evaluated any NIR instruments for corn starch due to the difficulties in obtaining the samples that meet the requirements for the accuracy set.

Proposed changes to NCWM Publication 14, Near Infrared:

III. Accuracy, Precision and Reproducibility Requirements

Grain analyzers will be tested for accuracy, repeatability (precision), and reproducibility over the applicable constituent concentration ranges shown in Table 1. Instrument and calibration performance will be individually tested for each grain type and constituent.

Table 1. Constituent Ranges for Type Evaluation

Grain Type	Constituent	Constituent Range (%) at Moisture Basis (M.B.) Shown	Low Moisture Range	High Moisture Range
Durum Wheat	Protein	10 – 18 at 12% M.B.	10% – 12%	13% – 15%
Hard Red Spring Wheat	Protein	10 – 19 at 12% M.B.		
Hard Red Winter Wheat	Protein	8 – 18 at 12% M.B.		
Hard White Wheat	Protein	9 – 16 at 12% M.B.		
Soft Red Winter Wheat	Protein	9 – 12 at 12% M.B.		
Soft White Wheat	Protein	8 – 15 at 12% M.B.		
All-Class Wheat Calibration*	Protein	8 – 19 at 12% M.B.		
Wheat Excluding Durum*	Protein	8 – 19 at 12% M.B.		
Two-rowed Barley	Protein	8 – 17 at 0% M.B.	10% – 12%	13% – 15%

Six-rowed Barley	Protein	8 – 17 at 0% M.B.		
All-Class Barley Calibration*	Protein	8 – 17 at 0% M.B.		
~~Corn~~ **Or** Corn	Protein	8 – 12 at 0% M.B.	11% – 13%	14% – 16%
	~~Oil~~ **Or** Oil	~~3 – 9 at 0% M.B.~~ **Or** 3 – 5 at 0% M.B.		
	Starch	67 – 73 at 0% M.B.		
Soybeans	Protein	30 – 40 at 13% M.B.	10% – 12%	13% – 15%
	Oil	16 – 21 at 13% M.B.		

Note: Calibrations marked with an asterisk (*) are "Multi-class" calibrations

Background / Discussion:
The challenge is that Iowa State may not have sufficient samples that are large enough to provide the NTEP laboratory with appropriate amounts of the samples to allow for testing. When testing, the laboratory will consume approximately 150 grams from each sample. Iowa State has also worked with several NIR manufacturers to develop corn calibrations for their instruments and may not have a large number of samples that have not been included in any of these calibrations. Dr. Charles Hurburgh also indicated that the newer high oil hybrids may not be well predicted on the current GIPSA calibration that is used to screen samples for the accuracy set selection.

The Grain Analyzer Sector is asked to consider the proposed change and discuss the proposed changes during the sector meeting.

9. Test Weight per Bushel Acceptance and Maintenance Tolerances

Source:
Mr. Jeffrey D. Adkisson, Grain and Feed Association of Illinois

Purpose:
Due to problems cited in the grain and feed industry, review and make any needed changes to the test weight per bushel tolerances in *NIST Handbook 44* Section 5.56(a).

Item Under Consideration:
During the discussion of this item at the 2012 sector meeting it was noted that because the system is rapidly changing over to the new UGMA technology which is going to result in the improvement in TW readings, TW should resolve itself as older instruments are retired. It was also mentioned that test weight data is needed to review the current system to make any needed changes to test weight per bushel and that sample selection when testing meters for test weight, should be reviewed. It was receommended that TW per bushel comparison charts be developed for review. Cathy Brenner developed these charts and the Sector is asked to review these charts for discussion during the meeting. The charts are available for review or can be downloaded for printing at the following web address:

http://www.ncwm.net/resources/dyn/files/1081742zef27d924/_fn/TW+2013+Sector+Meeting.pdf

Background / Discussion:
This is a carryover from the sector's 2011 meeting. Mr. Adkisson, Grain and Feed Association of Illinois, cited problems his industry is having regarding Test Weight (TW) per bushel. GMMs that have failed TW during field inspection are sent to the manufacturer for repair. When the meters are returned, the reports indicate that no problems have been found. There are also situations where a meter has failed TW. When the state inspector subsequently tested the elevator's quart kettle it matched the meter, but it didn't match the state inspector's sample. This is particularly frustrating for the country elevators in Illinois that are using the GMM TW only as a screening tool.

At the Sector's August 2011 meeting a task group was formed to investigate the whole TW system with the goal of defining procedures that would improve TW both for the user and for the inspection system. Past data obtained by the Sector had indicated that the existing tolerances were reasonable. It was felt that increasing TW tolerances would only cover up the problems. What was needed was an investigation of the whole system of calibrating meters, then translating that calibration into the field, and then keeping it that way.

Dr. Charles R. Hurburgh, Jr., Iowa State University, agreed to head the task group. Other TW Task Group members included:

- Mr. Jeffery Adkisson – Grain and Feed Association of Illinois
- Ms. Diane Lee – NIST, OWM
- Ms. Cassie Eigenmann – DICKEY-john Corporation
- Mr. Ivan Hankins – Iowa Department of Agriculture/Weights and Measures
- Mr. Tim Kaeding – Perten Instruments, Inc.
- Mr. Karl Cunningham – Illinois Department of Agriculture

Further action on the issue of tolerances was postponed until the TW Task Group was able to recommend appropriate action.

In Early 2012 the TW Task Group developed the following list of Action Items:

- Survey the grain industry as to the frequency of discounting each of the major grains (wheat, corn, and soybeans) for test weight, and within those discounted the frequency of use of the meter test weight versus the cup-bucket test weight.
- Survey the industry for comparative data between meters and an Official GIPSA agency on the same samples.
- Develop a draft procedure for sample selection and pre-qualification

Dr. Hurburgh reported that discounting for low TW was not an issue in either 2010 or 2011. TWs for corn were so high that discounting was not an issue. Within Iowa most grain elevators were using the TW reported by their GMM. Only a few were using the standard quart kettle method. This is likely to change in the 2012 harvest as low TWs are likely to be more common. Also, there may not be as much TW increase in drying as would normally be expected. TW may come up again as a discount factor.

Same sample TW data has not been collected comparing grain elevator GMMs with an Official GIPSA agency. Dr. Hurburgh explained that this information should be relatively easy to obtain, because in almost every case when a train is officially graded the samples are run at the grain elevator first. Since last year's sector meeting, the rapid acceptance of the new UGMA GMMs as Official Meters for corn, soybeans, sunflowers, and grain sorghum (with the remaining grains scheduled to switch to UGMA GMMs for Official Inspection on May1, 2013), has altered some of the issues. The new technology not only provides a better moisture measurement, but a better TW measurement as well.

The remaining action item that the task group believed was necessary was a procedure for pre-qualifying TW samples as being good predictors for the TW function as well as moisture function. Most States pre-screen moisture samples to get the outliers out of the system. That pre-qualification would have to be expanded if TW is to be actively used to reject meters on the basis of TW.

Dr. Hurburgh recommended that the sector not adjust TW tolerances at this time, because the system is rapidly changing over to the new technology which is going to result in the improvement in TW readings. The problem should resolve itself as older instruments are retired.

Mr. Karl Cunningham, Illinois Dept of Agriculture, informed the Sector that Illinois's TW rejection rate has gone down in the last two years. He has no problem with TW on the meters in his laboratory and doesn't think the present tolerances are a problem. Many of the field problems may be due to rough handling of the meters during

shipping. Mr. Cunningham advises elevators who have to have their devices worked on to take them to the manufacturer's service department themselves if at all possible.

Mr. Tim Kaeding, Perten Instruments, suggested that there might be value in expanding the Phase II OCP grain moisture comparison charts to include TW. Dr. Hurburgh recommended that a TW comparison chart showing the spread of TW measurements for individual meters against the corresponding official quart kettle TW measurements would address the tolerance issue, whereas a bias plot would not. He suggested plotting meter TWs on the x-axis and quart kettle results on the y-axis. A best-fit line could be drawn for each meter.

The sector agreed that TW comparison charts should be prepared for the 3 grains which are most likely to be subject to discounts on the basis of TW: Corn and two wheat classes. The wheat classes selected were: Hard Red Winter and Soft Red Winter. Manufacturer approval is required for NTEP Phase II TW performance data to be released for publication even if individual instruments are not identified. The two meter manufacturers present indicated that they would approve the release of this data. Permission would have to be obtained from the other manufacturers. The sector agreed to postpone further action on changing TW tolerances until more information was available.

Ms. Brenner developed TW comparison charts for corn and two wheats and will review the data.

10. Report on International Organization of Legal Metrology (OIML) TC 17/SC 1 R 59 *Moisture Meters for Cereal Grains and Oilseeds* and proposed changes to the NTEP humidity test for grain moisture meters and near infrared grain analyzers

Source:
Cathy Brenner, USDA, GIPSA

Purpose:
Harmonize OIML and NTEP test procedures to align the U.S. humidity test procedures with the OIML D11 Damp Heat test procedure.

Item Under Consideration:
Replace the current Humidity test in Publication 14 for both moisture and protein with the International OIML D11 Damp heat test as shown below. If the following changes are approved, then the detailed procedure in Appendix A for Grain Moisture Meters will need to be revised by the NTEP laboratory.

For Grain Moisture Meters –

~~**Humidity**~~

~~Each instrument (power on) will be placed in an environmental chamber at 22 °C and a relative humidity of 20% for 16 hours. A single HRW sample (12% 14% moisture content) will then be analyzed 10 times. The relative humidity will be raised to 90% (22 °C) and, after the instrument has equilibrated at this humidity for at least 16 hours, the HRW sample will again be analyzed 10 times. A maximum bias shift of (0.20% of grain moisture content is allowed between the average of 10 readings made at 20% relative humidity and those made at 90% relative humidity.~~

Damp Heat

Each instrument (power on) will be placed in an environmental chamber at 22 °C and 30% relative humidity for 16 hours. Three HRW wheat samples, one selected from each of the 2% moisture intervals, will be placed in the environmental chamber two hours prior to testing. Each sample will be analyzed five times and removed from the chamber. The environmental chamber will be set to the maximum ambient temperature specified by the manufacturer or 45 °C whichever is less and a relative humidity of 50% but not to exceed the absolute humidity of 20g/m^3 for 16 hours. The samples will be placed in the environmental chamber two hours prior to testing. Each sample will be analyzed five times. A maximum bias shift of 0.18% of grain

moisture content per sample is allowed between the average readings at the lower temperature and those made at the higher temperature.

For Near Infrared Grain Analyzers –

~~**Humidity**~~

~~Each instrument (power on) will be placed in an environmental chamber at 22 °C and a relative humidity of 20% for 16 hours. A single HRW sample will then be analyzed 10 times. The relative humidity will be raised to 90% (22 °C.) After the instrument has equilibrated at this humidity for at least 16 hours, the HRW sample will again be analyzed 10 times.~~

~~A maximum bias shift of ± 0.20 is allowed between the average of 10 readings made at 20% relative humidity and those made at 90% relative humidity.~~

Damp Heat

Each instrument (power on) will be placed in an environmental chamber at 22 °C and 30% relative humidity for 16 hours. Three HRW wheat samples, one selected to represent the low (10%-12%), medium (12%-14%), and high (14%-16%) protein levels, will be placed in the environmental chamber two hours prior to testing. Each sample will be analyzed five times and removed from the chamber. The environmental chamber will be set to the maximum ambient temperature specified by the manufacturer or 45 °C whichever is less and a relative humidity of 50% but not to exceed the absolute humidity of 20g/m^3 for 16 hours. The samples will be placed in the environmental chamber two hours prior to testing. Each sample will be analyzed five times. A maximum bias shift of 0.18% of grain moisture content per sample is allowed between the average readings at the lower temperature and those made at the higher temperature.

Background / Discussion:
This item was included on the sector's agenda to provide a summary of the activities of OIML TC17/SC1 for the grain analyzer sector and to those Sector members that participate on the United States National Working Group (USNWG) on grain moisture meters. In addition the sector is asked to review a proposal to change the Humidity test in NCWM Publication 14 to align with the OIML D11 and IEC damp heat test procedure.

OIML TC17/SC1 was tasked to revise OIML R 59 *Moisture Meters for Cereal Grains and Oilseeds* to reflect new technologies and acual grain analysis. The Co-Secretariats (China and the United States) are working closely with an International Project Group to revise OIML Recommendation R 59 *Moisture Meters for Cereal Grains and Oilseeds*. The U.S. completed a six committee draft (6CD) of OIML R 59, which was circulated to the international project group and the U.S. National Working Group (USNWG) on grain moisture measuring devices for review and comment on March 6, 2013. The U.S. Co-secretariat requested that the comments to the 6CD be submitted by June 6, 2013. The U.S. Secretariat collated the U.S. and international comments to the 6CD and these comments were reviewed at the TC17/SC1 meeting hosted by NIST/OWM July 23-24, 2013.

At the TC17/SC1 July 23-24, 2013 meeting, comments to the 6 CD were reviewed and the major discussion was harmonization of test procedures between OIML TC17/SC1 R59 *Moisture Meters for Cereal Grains and Oilseeds* and OIML TC17/SC8 Recommendation on *Protein Measuring Instruments for Cereal Grain and Oil Seeds.*

At the July 2013 meeting it was discussed that the international damp heat test (OIML D11 and IEC) is significantly different from the NTEP Humidity test. The international test is more robust and more accurately reflects the environmental conditions an instrument is likely to encounter in field use. The damp heat test is conducted at a maximum temperature of either the manufacturer specified upper ambient temperature or 30 °C and a maximum relative humidity of 85%. The damp heat test is designed to evaluate the device under the environmental (temperature and relative humidity) conditions it will encounter during operation.

At the December 1991 organizational meeting, the NIR Wheat Protein Analyzer sector reviewed the USDA Federal Grain Inspection Service's (FGIS) Design Criteria and Operational Performance Specifications (DCOPS) for Grain

Constituent Measuring Instruments using Near Infrared Spectroscopy dated January 1989. The NTETC NIR sector recommended that the environmental tests, including Humidity, listed in the DCOPS be adopted and that tolerances for some test may need to be re-evaluated. The Humidity test was designed to evaluate the affect of humidity on the instrument while holding the temperature constant.

At the March 1992 NTETC grain moisture meter sector meeting, the FGIS Moisture Handbook, NCWM Handbook 44, and OIML International Recommendation R59 "Moisture Meters for Cereal Grains and Oilseeds" were reviewed. The subcommittee discussed that humidity might have considerable affect on the performance of thermogravimetric devices and resistance meters. It was suggested that humidity tests could be adapted from the OIML R59 Damp heat, stead state test.

The moisture subcommittee met in August 1992 and recommended the Humidity test that is currently in Publication 14 which agrees with the NIR test. At the October 1992 NTETC grain moisture meter sector meeting, the sector approved the recommendations made by the subcommittee for the humidity test.

Since 1994, no device has failed the humidity test for either moisture or protein.

The proposed damp heat test for the OIML Protein document specifies the test as shown below. At the July 2013 meeting, it was agreed to review the number of replicates used for the test. The number of replicates per sample being considered is five.

C.5.4 Damp heat

EUT	Two sample instruments of the submitted type, set-up according to clause C.2.1.
Spare unit	A sample instrument of the submitted type, set-up according to clause C.2.1 and maintained at reference conditions for the duration of the test.
Grain samples	One set from a single grain type comprised of three samples that represent the legally relevant *P*MB range (i.e. one sample for each low, mid and high *P*MB). Allowable grains are specified by the national responsible body. Wheat is the preferred grain type. Except during analysis, each sample is kept in its enclosure during the test. The enclosed samples are only introduced to the damp heat 2 hours prior to testing. Samples used in a climatic test shall not be reused in other tests.
Standards	IEC 60068-2-78 [16], IEC 60068-3-4 [17]
Test method and procedure (in brief)	Test Cab: Damp heat, steady state The test consists of exposure to the specified maximum temperature and the specified constant relative humidity for the specified time. The change of temperature shall not exceed 1 °C/min during heating up and cooling down. The absolute humidity of the test atmosphere shall not exceed 20 g/m^3. When testing is performed at temperatures lower than 35 °C, the relative humidity shall not exceed 50%. Six *P*MB measurements on every sample are taken using each unit, at every test condition: i) EUT and grain samples at reference temperature ii) EUT after damp heat exposure, grain samples at maximum temperature and RH iii) EUT and grain samples after recovery at reference conditions
Sample monitoring	To ensure that heating, exposure to moisture and recovery do not change the *P*MB of grain samples significantly, the grain samples are monitored by a spare unit.
Test severity	Exposure duration (after EUT stabilisation): 2 days; Maximum RH: 85% Maximum temperature: TH or 30 ºC TH is the maximum temperature in the operating range specified by the national responsible body.
Suggested steps	1) The EUT is powered on and stabilised at reference temperature. 2) In a separate chamber, the spare unit is powered on and equilibrated at reference temperature with the grain samples. 3) Sample 1 is analysed once on instrument 1, then once on instrument 2, then once on the spare unit. Further *PMB* measurements are taken across the three units in the same manner, until six *P*MB measurements are recorded for each instrument. 4) Step 3 is repeated for the other two grain samples.

	5) The EUT is subjected to the maximum temperature and humidity and stabilised. The exposure duration is observed. Two hours prior to the end of the exposure duration, the enclosed grain samples are introduced to damp heat conditions. 6) All the hot grain samples are analysed in turn on both units of the EUT, alternating between the two instruments, until three *P*MB measurements per grain samples are recorded for each instrument. 7) The samples are retained at the location of the EUT for as long as necessary to equilibrate at the maximum temperature. Each sample is analysed three times on both units of the EUT again. 8) After ensuring that six *P*MB measurements on each hot sample are recorded for each instrument, the EUT and grain samples are recovered to reference temperature. 9) Steps 3 – 4 are repeated.
Test result	Values for the error shift on every grain sample are calculated at each test condition for each unit (of the EUT). Error shift (damp heat) = (Mean *P*MB condition ii – Mean *P*MB condition i) Error shift (recovery) = (Mean *P*MB condition iii – Mean *P*MB condition i) – Correction* *Application of a correction is required if a significant change in the sample *PMB* during heating and/or recovery is indicated by the sample stability test.
Grain sample stability test and correction	The *P*MB variation on a grain sample *calculated from measurements on the spare unit*, shall be within the limit in Table 4 column 9 for no correction to apply. Sample *P*MB variation (recovery) = Mean *P*MB (condition iii) – Mean *P*MB (condition i) Any sample *PMB* variation that exceeds the limit, shall be applied as a correction, e.g.: Sample *P*MB variation (recovery) = Correction for error shift (recovery)
Acceptance requirements	All values for the error shift (i.e. with any necessary correction) shall be within the limit in clause 4.5 Table 4 column 9. All operational functions shall operate as designed.

The Grain Analyzer Sector is asked to review and decide whether or not to replace the NTEP Publication 14 GMM and NIR Humidity test procedure with the OIML D11 Damp Heat test procedure.

11. Report on OIML TC 17/SC 8 Protein Measuring Instruments for Cereal Grain and Oil Seeds

Background / Discussion:
This item was included on the sector's agenda to provide a summary of the activities of OIML TC 17/SC 8 to the grain analyzer sector and to those Sector members that participate on the United States National Working Group (USNWG) on grain protein measuring instruments. OIML TC17/SC8 was formed to study the issues and to develop a Recommendation on *Protein Measuring Instruments for Cereal Grain and Oil Seeds.* Australia is the Secretariat for this subcommittee. The third committee draft (3CD) for this Recommendation was circulated to the US national Working group for comments on July 3, 2012 for review and comment and comments were requested by September 8, 2012. The U.S. Comments to 3CD were forwarded to the secretariat and the secretariat developed the 4CD based on these comments.

The 4CD was circulated to the USNWG on grain protein measuring instruments on April 9, 2013 and comments to the 4CD of TC 17/SC 8 were requested by June 13, 2013. The U.S. comments to the 4CD were forwarded to the secretariat. The U.S. was requested to vote on the 4CD and a vote of no was provided due to a number of differences in the test procedures of the OIML Recommendation for *Protein Measuring Instruments for Cereal Grain and Oil Seeds* and the OIML Recommendation 59 *Moisture Meters for Cereal Grain and Oilseeds.*

A meeting was hosted by NIST, OWM, July 24-25, 2013 to discuss the comments to the 4CD for the Recommendation on *Protein Measuring Instruments for Cereal Grain and Oil Seeds*. Discussions on 4CD dealt mostly with harmonization of testing with the 6CD of the OIML Recommendation R59 *Moisture Meters for Cereal Grain and Oilseeds*, software requirements, and influence quantities and test sample temperature.

12. Software Sector Items

(a) Identification of Certified Software

Source:
NTETC Software Sector

Purpose:
Review and provide comment to the Software Sector reports and conculsion on software issues.

Background:
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 evaluated and approved by the lab?" In previous meetings it was shown that the international community has addressed this issue (both WELMEC and OIML).

From WELMEC 7.2:

> **Required Documentation:**
> The documentation shall list the software identifications and describe how the software identification is created, how it is inextricably linked to the software itself, how it may be accessed for viewing and how it is structured in order to differentiate between version changes with and without requiring a type approval**.**

From OIML D-31:

> The executable file "**tt100_12.exe**" is protected against modification by a checksum. The value of checksum as determined by algorithm **XYZ** is **1A2B3C**.

Previous discussions have included a listing of some additional examples of possible valid methods (not limiting):

- CRC (cyclical redundancy check)
- Checksum
- Inextricably Linked version no.
- Encryption
- Digital Signature

Is there some method to give the weights and measures inspector information that something has changed?
Yes, the Category III Audit Trail or other means of sealing.

How can the weights and measures inspector identify an NTEP Certified version?
They can't, without adding additional requirements like what is described here, in conjunction with including the identifier on the CC).

The sector believes that we should work towards language that would include a requirement similar to the International Organization of Legal Metrology (OIML) requirement in *NIST Handbook 44*. It is also the opinion of the sector that a specific method should not be defined; rather the manufacturer should utilize a method and demonstrate the selected identification mechanism is suitable for the purpose. It is not clear from the discussion where such proposed language might belong.

NTEP strongly recommends that metrological software be separated from non-metrological software for ease of identification and evaluation.

From OIML:

Separation of software parts - All software modules (programmes, subroutines, objects etc.) that perform metrologically significant functions or that contain metrologically significant data domains form the metrologically significant software part of a measuring instrument (device or sub-assembly). The conformity requirement applies to all parts and parts shall be marked according to Section G-S-X.X.

If the separation of the software is not possible or needed, then the software is metrologically significant as a whole.

(Segregation of parameters is currently allowed - see table of sealable parameters)

Initial draft proposed language: (G-S.1.1?)

NIST Handbook 44 (This has been written into G-S.1.d.3): Identification of Certified Software:

Software-based electronic devices shall be designed such that the metrologically significant software is clearly identified by the version or revision number. ~~The identification,~~ and this identification ~~of the software~~ shall be ~~inextricably~~ directly and inseparably linked to the software itself. The version or revision number may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.

From NCWM Publication 14:

Identification of Certified Software:

Note: Manufacturers may choose to separate metrologically significant software from non-metrologically significant software. Separation would allow the revision of the non-metrological portion without the need for further evaluation. In addition, non-metrologically significant software may be updated on devices without breaking a seal, if so designed. Separation of software requires that all software modules (programs, subroutines, objects etc.) that perform metrologically significant functions or that contain metrologically significant data **~~domains~~** form the metrologically significant software part of a measuring instrument (device or sub-assembly). If the separation of the software is not possible or needed, then the software is metrologically significant as a whole. **~~The conformity requirement applies to all parts and parts shall be marked according to Section G-S-X.X.~~**

The manufacturer must describe and possibly demonstrate how the version or revision identifier is directly and inseparably linked to the metrologically significant software. Where the version revision identifier is comprised of more than one part, the manufacturer shall describe which portion represents the metrological significant software and which does not.

From OIML D-31:

Legally relevant software of a measuring instrument / electronic device / sub-assembly shall be clearly identified with the software version or another token. The identification may consist of more than one part but at least one part shall be dedicated to the legal purpose.

The identification shall be inextricably linked to the software itself and shall be presented or printed on command or displayed during operation or at start up for a measuring instrument that can be turned off and on again. If a sub-assembly/an electronic device has neither display nor printer, the identification shall be sent via a communication interface in order to be displayed/printed on another sub-assembly/electronic device.

The first sentence of the first paragraph above is already addressed in *NIST Handbook 44's* marking requirements.

In 2010, the sector recommended the following change to *NIST Handbook 44*, General Code: G-S.1(d) to add a new subsection (3):

(d) the current software version or revision identifier for ~~***not built for purpose***~~ ***software-based electronic*** *devices;*
[Nonretroactive as of January 1, 2004]
(Added 2003) **(Amended 20XX)**

(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)

(3) The version or revision identifier shall be directly and inseparably linked to the software itself. The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.
[Nonretroactive as of January 1, 201X]
(Added 20XX)

Also the sector recommended the following information be added to *NCWM Publication 14* as explanation/examples:

- Unique identifier must be displayable/printable on command or during operation, etc.
- 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)

There was some additional discussion on this item regarding where this new requirement was best located. It was suggested that the first sentence of G-S.1.d.(3) could be added as a clause to the base paragraph G-S.1(d) text, e.g. "*the current software version or revision identifier for* ~~***not built for purpose***~~ ***software-based*** *devices, which shall be directly and inseparably linked to the software itself;"* .

It also was suggested that the second sentence in G-S.1.d. (3) might be more suitable for *NCWM Publication 14*, as it describes more "how" than "what" the requirement entails.

In addition, the sector considered the following information to be added to *NCWM Publication 14* as explanation/examples:

- The current software identifier must be displayable/printable on command during operation (or made evident by other means deemed acceptable by G-S.1.)
- At a minimum, the software identifier must include a version/revision indication (1.02.09, rev 3.0 a, etc). It could also consist of / contain checksum, etc (crc32, for example).
- The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software.

Other questions that are still outstanding:

- If we allow hard-marking of the software identifier (the sector has wavered on this in the past), does the above wording then imply that some mechanical means is required (i.e. physical seal) to "inseparably link" the identifier to the software?
- If a device is capable of doing so, does it still have to be able to display, print or communicate the identifier somehow, even if it is hard-marked?

At the 2012 NTETC Software Sector Meeting, there was some discussion as to where the terminology regarding inextricably linking the software version or revision to the software itself belonged. At the moment, it is not incorporated in the proposed text for G-S.1. *NCWM Publication 14* may be a better option for the time being. This would be another item that would benefit from further explanation in a supplementary document.

Several sector members were of the opinion that attempting to make this change at the same time as the earlier changes might be a difficult sell. Mr. Truex, NTEP Administrator, reiterated the necessity of baby steps.

In 2012, the sector thus recommended adding the following to *NCWM Publication 14* and forward to NTETC Weighing, Measuring, Grain Analyzer sectors for feedback:

Identification of Certified Software:

> Note: Manufacturers may choose to separate metrologically significant software from non-metrologically significant software. Separation would allow the revision of the non-metrological portion without the need for further evaluation. In addition, non-metrologically significant software may be updated on devices without breaking a seal, if so designed. Separation of software requires that all software modules (programs, subroutines, objects etc.) that perform metrologically significant functions or that contain metrologically significant data domains form the metrologically significant software part of a measuring instrument (device or sub-assembly). If the separation of the software is not possible or needed, then the software is metrologically significant as a whole. The conformity requirement applies to all parts and parts shall be marked according to Section G-S-X.X.
>
> The manufacturer must describe and possibly demonstrate how the version or revision identifier is directly and inseparably linked to the metrologically significant software. Where the version revision identifier is comprised of more than one part, the manufacturer shall describe which portion represents the metrological significant software and which does not.

Discussion:
The Measuring Sector reviewed this item and had no feedback other than a statement that they support the continuing / ongoing efforts of this sector. The Weighing Sector summary mentioned that no one opted to provide comment. They agreed to take no further action on this item, pending further action from the Software Sector. This was specifically in reference to the accepted symbols.
For the time being, Jim Truex recommended that we not attempt to provide a definition for "software-based device". We discussed the possibility of combining this change with the first agenda item, which had been attempted in previous years. Alternatively, if the HB44 changes from agenda item 1 are made, this agenda item could be addressed in Pub. 14.

Conclusion:
After further discussion, the wording in G-S.1.d under agenda item 1 was changed. Agenda item 2 will remain; however, it will address potential changes to Pub. 14 and contain no suggested modifications to Handbook 44. (See changes and conclusion under agenda item 1 for further details.)

The Sector chair volunteered to review the existing slide presentation detailing the purpose of these changes, to ensure that it accurately reflects this information.

(b) Software Protection/Security

Source:
NTETC Software Sector

Background:
The sector agreed that *NIST Handbook 44* already has audit trail and physical seal, but these may need to be enhanced.

From the WELMEC Document:

Protection against accidental or unintentional changes
Metrologically significant software and measurement data shall be protected against accidental or unintentional changes.

Specifying Notes:
Possible reasons for accidental changes and faults are: unpredictable physical influences, effects caused by user functions and residual defects of the software even though state of the art of development techniques have been applied.

This requirement includes consideration of:

a) Physical influences: Stored measurement data shall be protected against corruption or deletion when a fault occurs or, alternatively, the fault shall be detectable.

b) User functions: Confirmation shall be demanded before deleting or changing data.

c) Software defects: Appropriate measures shall be taken to protect data from unintentional changes that could occur through incorrect program design or programming errors, e.g. plausibility checks.

Required Documentation:
The documentation should show the measures that have been taken to protect the software and data against unintentional changes.

Example of an Acceptable Solution:

- The accidental modification of software and measurement data may be checked by calculating a checksum over the relevant parts, comparing it with the nominal value and stopping if anything has been modified.
- Measurement data are not deleted without prior authorization, e.g. a dialogue statement or window asking for confirmation of deletion.
- For fault detection see also Extension I.

The sector continued to develop a proposed checklist for *NCWM Publication 14*. The numbering will still need to be added. This is based roughly on R 76 – 2 checklist and discussions beginning as early as the October 2007 NTETC Software Sector Meeting. The information requested by this checklist is currently voluntary, however, it is recommended that applicants comply with these requests or provide specific information as to why they may not be able to comply. Based on this information, the checklist may be amended to better fit with NTEP's need for information and the applicant's ability to comply.

The California, Maryland and Ohio laboratories agreed to use this check list on one of the next devices they have in the lab and report back to the sector on what the problems may be. In February 2011, the North Carolina laboratory was also given a copy of the check list to try.

1. Devices with ~~Embedded~~ Software ~~TYPE P (aka built-for-purpose)~~

1.3.	Declaration of the manufacturer that the software is used in a fixed hardware and software environment. **AND**	☐ Yes ☐ No ☐ N/A
1.4.	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.

1.5.	The software documentation contains:	
1.5.3.	Description of all functions, designating those that are considered metrologically significant.	☐ Yes ☐ No ☐ N/A
1.5.4.	Description of the securing means (evidence of an intervention).	☐ Yes ☐ No ☐ N/A
1.5.5.	Software Identification, including version / revision	☐ Yes ☐ No ☐ N/A
1.5.6.	Description how to check the actual software identification.	☐ Yes ☐ No ☐ N/A
1.6.	The software identification is:	
1.6.7.	Clearly assigned to the metrologically significant software and functions.	☐ Yes ☐ No ☐ N/A
1.6.1.	Description how to check the actual software identification.	☐ Yes ☐ No ☐ N/A
1.6.2.	Provided by the device as documented.	☐ Yes ☐ No ☐ N/A
1.6.3.	Directly linked to the software itself.	☐ Yes ☐ No ☐ N/A

2. ~~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)~~

2.1.	The metrologically significant software is:	
2.1.4.	Documented with all relevant (see below for list of documents) information.	☐ Yes ☐ No ☐ N/A
2.1.5.	Protected against accidental or intentional changes.	☐ Yes ☐ No ☐ N/A
2.2.	Evidence of intervention (such as, changes, uploads, circumvention) is available until the next verification / inspection (e.g., physical seal, Checksum, Cyclical Redundancy Check (CRC), audit trail, etc. means of security).	☐ Yes ☐ No ☐ N/A

3. Software with ~~Closed Shell (~~no access to the operating system and/or programs possible for the user~~)~~

3.1.	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
3.2.	Check whether the manufacturer has submitted a written declaration of the completeness of the set of commands.	☐ Yes ☐ No ☐ N/A

4. Operating System and / or Program(s) Accessible for the User

4.1.	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 Weights and Measures jurisdiction and type-specific parameters).	☐ Yes ☐ No ☐ N/A
4.2.	Check whether the metrologically significant software will detect and act upon any unauthorized alteration of the metrologically significant	☐ Yes ☐ No ☐ N/A

software using simple software tools (e.g., text editor).

5. Software Interface(s)

5.1. Verify the manufacturer has documented:

5.1.6.	The program modules of the metrologically significant software are defined and separated.	☐ Yes ☐ No ☐ N/A
5.1.7.	The protective software interface itself is part of the metrologically significant software.	☐ Yes ☐ No ☐ N/A
5.1.8.	The functions of the metrologically significant software that can be accessed via the protective software interface.	☐ Yes ☐ No ☐ N/A
5.1.9.	The parameters that may be exchanged via the protective software interface are defined.	☐ Yes ☐ No ☐ N/A
5.1.10.	The description of the functions and parameters are conclusive and complete.	☐ Yes ☐ No ☐ N/A
5.1.11.	There are software interface instructions for the third party (external) application programmer.	☐ Yes ☐ No ☐ N/A

The Maryland laboratory had particular questions regarding 3.1 and 5.1. The information for 3.1 could be acquired from an operator's manual, a training video, or in-person training. The items in 5.1 were confusing to the evaluators. The terminology is familiar to software developers, but not necessarily others. It was indicated that manufacturers were typically quick to return the filled out questionnaire, but he didn't know how his laboratory was supposed to verify that it was true. Generally, the laboratories wouldn't be expected to verify things to that level. For example, if the manufacturer states that a checksum is used to ensure integrity, the laboratories wouldn't be expected to evaluate the algorithm used.

The intent was to see whether the manufacturer had at least considered these issues, not for evaluators to become software engineers. Perhaps a glossary or descriptive paragraphs might be added to assist the evaluators for if the manufacturer has questions for the evaluators.

OIML makes use of supplementary documents to explain the checklist they use. Below are links:
http://www.oiml.org/publications/D/D031-e08.pdf
http://www.welmec.org/latest/guides/72.html
http://www.welmec.org/fileadmin/user_files/publications/2-3.pdf

WELMEC document 2.3 is the original source for our checklist, but it's been significantly revised and simplified. Mr. Payne, Maryland Department of Agriculture, is going to review the other documents and come up with some suggestions for the checklist. Mr. Roach, California Division of Measurement Standards, is going to begin using the checklist. The international viewpoint is that any device running an operating system is considered to be Type U. Mr. Roach mentioned that they're having lots of problems with "skimmers" stealing PIN's. Is there some way they can detect this?

Mr. Lewis, Rice Lake Weighing Systems, Inc., mentioned that he liked Measurement Canada's website. When answering similar questions, different pages would appear, based on answers to those questions: http://www.ic.gc.ca/eic/site/mc-mc.nsf/eng/lm00573.html

At the 2011 NTETC Software Sector Meeting, the laboratories were polled to obtain any feedback on the use of the checklist. Maryland attempted to use this checklist a few times. They had some difficulty obtaining answers from the manufacturers because the individual(s) interacting with the Maryland evaluator didn't always have the required information on hand. More experience in using the checklist will help determine what needs to be revised.

It was suggested that the checklist could be sent to manufacturers for their feedback as well, with the stipulation that it a completely voluntary exercise and purely informational at this point. The laboratories will coordinate with willing manufacturers to obtain feedback.

Work is ongoing on this item with the intent that it eventually will be incorporated as a checklist in *NCWM Publication 14*; again the laboratories are requested to try utilizing this checklist for any evaluations on software-based electronic devices.

The checklist has been reviewed with an eye to making its terminology clearer to laboratories. Some examples and clarifications have been added as shown in the discussion section of this item. The revised checklist will be distributed to the laboratories for additional review. Maryland and California laboratories agreed to use the checklist on a trial basis.

Discussion:
Over the past year, attempts to use the current checklist did not meet with many difficulties. The checklists were given to the manufacturers to fill out, and that seemed to work rather well. Minor modifications (in red above) were made to clarify certain confusing areas or eliminate redundancy.

Conclusion:
The next step will be to forward it to the four sectors; we can report that the labs have tried using it on a trial basis and we're ready to recommend it for Pub. 14 with the modification suggested here, such as the removal of the Type P / Type U wording.

(c) Software Maintenance and Reconfiguration

Source:
NTETC Software Sector

Background:
After the software is completed, what do the manufacturers use to secure their software? The following items were reviewed by the sector. *Note that agenda Item 3 also contains information on Verified and Traced updates and Software Log.*

1. Verify that the update process is documented (OK)
2. For traced updates, installed Software is authenticated and checked for integrity

   Technical means shall be employed to guarantee the authenticity of the loaded software (i.e. that it originates from the owner of the type approval certificate). This can be accomplished (e.g. by cryptographic means like signing). The signature is checked during loading. If the loaded software fails this test, the instrument shall discard it and either use the previous version of the software **or become inoperative**.

   Technical means shall be employed to guarantee the integrity of the loaded software i.e. that it has not been inadmissibly changed before loading. This can be accomplished e.g. by adding a checksum or hash code of the loaded software and verifying it during the loading procedure. If the loaded software fails this test, the instrument shall discard it and either use the previous version of the software **or become inoperative**.

   Examples are not limiting or exclusive.

3. Verify that the sealing requirements are met

   The sector asked, What sealing requirements are we talking about?

   This item is **only** addressing the **software update**, it can be either verified or traced. It is possible that there are two different security means, one for protecting software updates (software log) and one for protecting the other

metrological parameters (Category I II or III method of sealing). Some examples provided by the sector members include but are not limited to:

- Physical Seal, software log
- Category III method of sealing can contain both means of security

4. Verify that if the upgrade process fails, the device is inoperable or the original software is restored

The question before the group is, Can this be made mandatory?

The manufacturer shall ensure by appropriate technical means (e.g. an audit trail) that traced updates of metrologically significant software are adequately traceable within the instrument for subsequent verification and surveillance or inspection. This requirement enables inspection authorities, which are responsible for the metrological surveillance of legally controlled instruments, to back-trace traced updates of metrologically significant software over an adequate period of time (that depends on national legislation). The statement in italics will need to be reworded to comply with US weights and measures requirements.

The sector **agreed** that the two definitions below for Verified update and Traced update were acceptable.

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.

Note: It's possible that the Philosophy of Sealing section of NCWM Publication 14 may already address the above IF the definitions of Verified and Traced Updates (and the statement below) were to be added. The contrary argument was that it may be better to be explicit).

Use of a Category 3 audit trail is required for a Traced Update. A log entry representing a traced software update shall include the software identification of the newly installed version.

The sector recommended consolidating the definitions with the above statement thus:

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**~~ Category 3 audit trail. The audit trail entry shall include the software identification of the newly installed version.

In 2012, the sector recommended that as a first step, the following be added to *NCWM Publication 14*:

The updating of metrologically significant software, including software that checks the authenticity and integrity of the updates, shall be considered a sealable event.

Mr. Truex, NTEP Administrator, indicated his opinion that the above sentence is unnecessary since it's self-evident. It was agreed by the group however to ask the other sectors for feedback on the value of this addition.

Though the sector is currently considering only the single sentence be incorporated into *NCWM Publication 14* for the time being, ultimately, the sector may wish to advance the remaining language of the original item submission.

Discussion:
The Sector had no information indicating that the other sectors had yet been approached for feedback on the value of the addition of the proposed sentence.

Conclusion:
This sector would like the other sectors to evaluate this for inclusion in Pub. 14.
We'd also like to include some description indicating that an existing audit trail should be protected during a software update, though that may already be a requirement. This does appear to be addressed in the Requirements for Metrological Audit Trails Appendices in Pub. 14.

13. Update on Proficiency Testing

Source:
Dr. Hurburgh, Iowa State University

Purpose:
Develop an air-oven proficiency testing program to ensure state laboratory and manufacturers air-oven measurements are traceable to the official USDA, GIPSA air-oven measurements.

Item Under Consideration:
Update on progress of the ongoing air-oven proficiency testing program for states maintaining a grain moisture laboratory and GMM manufacturers.

Background / Discussion:
At the 2009 NTETC Grain Analyzer Sector Meeting Dr. Hurburgh, Iowa State University, urged the representatives from the American Oil Chemists Society (AOCS) to prepare a proposal so that the collaborative (air-oven) 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.

At the 2011 NTETC Grain Analyzer Sector Meeting, Ms. Johnson, AOCS, proposed an air-oven/GMM proficiency testing series designed specifically to address the needs of GMM manufacturers and states maintaining a grain moisture laboratory. AOCS would administer the program, oversee distribution of samples, compile results, perform statistical analysis of results, and distribute a report to participants. AOCS does not collect the samples. This is subcontracted to suitable providers. AOCS does not have laboratories. Since GIPSA/ FGIS is a certified laboratory already participating in the AOCS Soybean Quality Traits program, GIPSA air-oven results could be reported for comparison.

At the sector's August 2012 meeting the sector learned that Ms. Christine Atkinson will be taking over the Proficiency Testing program for States and interested manufacturers formerly headed by Ms. Amy Johnson. Ms. Atkinson verified that participant's cost will remain $100 per year. The sector reiterated that the program should focus solely on the standard FGIS air-oven method. Instrument results will not be reported. Participants' air-oven results will be compared against GIPSA's standard FGIS air-oven results. In response to Ms. Atkinson's question about scheduling, the sector was in general agreement that samples should ship after harvest, preferably between mid-January and mid-February with participants' results due 30 days after the shipping date.

The sector agreed upon the following Program Details:

Samples – Soybeans 2, Corn 2, Hard Red Winter Wheat 2

- Cost to Participants - $100.00/year
- Schedule:
    - Samples (6) ship between January 15 and February 15.

    - Samples must be tested within 5 business days of receipt with results due 30 days after the shipping date.
- Reports to be posted on www.SoybeanQualityTraits.org by 1 May.
- Only the GIPSA oven results will be identified. Individual manufacturer's and State participant's oven results will be assigned an identifier known only to the manufacturer or State participant. Instrument results will not be reported.
- Detailed Participant Instructions will be provided to each participant.

An update on any progress of proficiency testing will be discussed at the Sector meeting.

14. The Feasibility of a Phase II program for Near Infrared Grain Analyzers

Source:
Dr. Hurburgh, Iowa State University

Background/Discussion:
The Advisory Committee recommends that GIPSA initiate research to determine the feasibility of extending the theory of "equivalency" to multiple-constituent instruments in order to utilize standardized technology while maintaining accuracy and consistency in measurement of wheat protein.

Cassie Eigenmann will provide an update on the Grain Inspection Advisory Committee's Resolutions and the Sector is asked to discuss the feasibility of a Phase II program for Near Infrared Grain Analyzers.

15. Next Sector Meeting

A tentative date and location will be selected for the next meeting. An August meeting in Kansas City, Missouri is suggested.

16. Update on the New Meter Technology

Background/Discussion:
Dr. David Funk, Deputy Director & Chief Scientist, GIPSA/FGIS Technology and Science Division, will provide any additional updates on the new meter technology. Information can be found at the GIPSA web page on UGMA moisture meter implementation: http://www.gipsa.usda.gov/fgis/equipment.html