

Grain Analyzer Sector Agenda

September 13, 2016

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***.

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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	Unified 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 2016 NCWM Interim and Annual Meetings

The 2016 NCWM Interim Meeting was held January 10-13 in San Diego, California. The 2016 NCWM Annual Meeting was held July 24-28 in Denver, Colorado. At these meetings there were no Grain Analyzer Sector recommended changes to NCWM Publication 14 or NIST Handbook (HB) 44. The Grain Analyzer Sector has an existing item on the S&T agenda, **Item 360-4, Appendix D – Definitions: Remote Configuration Capability**, which remains a developmental item on the S&T agenda. See Grain Analyzer Agenda Item 4 for an update of activities on this item. Two Software Sector proposals for changes to NIST HB 44 concerning Software Identification and Metrological Significant Software were reviewed by the Grain Analyzer Sector. S&T agenda item 310-1 “Software Identification” to amend G-S.1. and S&T agenda item 310-2 “Metrological Significant Software” Adding G-S.9. were voted on and approved at the 2016 Annual Meeting. These items will be reviewed in detail during the Software Sector meeting on September 14, 2016, following the Grain Analyzer Sector meeting.

Mr. Jim Truex, NTEP Administrator, will provide an update on the Interim and Annual Meetings.

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

Mr. Jason Jordan, Grain Inspection, Packers and Stockyards Administration (GIPSA), the NTEP Participating Laboratory for grain analyzers, provided a list of grain analyzers that are enrolled in the Phase II for the 2016 harvest. There are 8 grain analyzer models enrolled for the 2016 harvest.

The 8 models:

1. Dickey-john Corp. – GAC2500-UGMA

2. Dickey-john Corp. – GAC2000, GAC2100, GAC2100a and GAC2100b
3. Perten Instruments Inc. - AM5200 and AM5200-A (UGMA)
4. Perten Instruments Inc. – IM9500 and IM9500 HLW/TW
5. Foss North America – Infratec 1241
6. Foss North America – Infratec Nova
7. The Steinlite Corp. – SL95
8. MTC Moisture Analyzers – MTC 999 ES

Mr. Jordan will bring the sector up-to-date on NTEP evaluation (Phase I) . He will also report on the collection and analysis of the OCP (Phase II) data on the 2015 crop.

3. Review of OCP (Phase II) Performance Data For Moisture and Test Weight per Bushel

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, Mr. Jordan, GIPSA, the NTEP Participating Laboratory for grain analyzers provided data for inclusion in the 2016 Grain Analyzer Sector Report showing the performance of NTEP meters compared to the air oven. This data is based on the last three crop years (2013–2015) using calibrations updated for use during the 2016 harvest season.

The 2013-2015 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/75601146zc793ed4d/ fn/2013-2015+NCWM+Sector+GMM+Biases.pdf

At the Sector’s August 2012 meeting, it was agreed that TW comparison and correlation 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 and limited to Air Oven reference values less than 20% moisture. The wheat classes selected were: Hard Red Winter and Soft Red Winter. Accordingly, Mr. Jordan, GIPSA, the NTEP Participating Laboratory for Grain analyzers prepared data showing the performance of NTEP meters compared to the GIPSA reference Quart Kettle Test Weight Apparatus. Mr. Jordan provided this information for the Grain Analyzer Sector 2016 report. This data is based on the last three crop years (2013 – 2015) using calibrations updated for use during the 2016 harvest season.

The 2013-2015 TW comparison and correlation charts and TW Phase II data are available for view or can be downloaded for printing at the following web address:

http://www.ncwm.net/_resources/dyn/files/75601147zb094dddb/ fn/2013-2015+NCWM+Sector+TW+plots.pdf

4. 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:

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.

At the August 2013 Grain Analyzer Sector Meeting, OWM had not drafted a definition for remote configuration capability to address devices which are programmed using removable media such as SD cards or flash drives. During the August 2013 grain analyzer sector meeting, the Sector discussed other ways devices can be remotely configured that should also be considered when drafting a definition for remote configuration capability to address these devices.

Mr. Hurburgh mentioned that we also need to consider devices that use cloud computing to remotely configure a device and suggested that we consider the various ways a device can be remotely configured.

The sector agreed that OWM should develop a proposal for a definition for remote configuration capability that addresses devices that use removable media such as SD cards, flash drives or other methods not covered by the existing definition.

At the 2013 Weighing Sector meeting, OWM requested members of the Sector help identify the various types of removable storage media (e.g., USB flash drives, SD memory cards, etc.) currently in use with weighing equipment and to describe the functionality of that media. The information provided would likely be used by OWM to develop some draft proposals to amend NIST Handbook 44 to adequately address the security of the metrological significant parameters of devices using such media.

The following feedback was provided by members of the Sector to OWM:

- I am not in favor of changing standards for advances in technology.
- Both SD cards and USB Flash drives can be used for data transfer and data storage. It would be difficult to address all devices by changing the General Code.
- There are other technologies besides SD and Flash digital storage devices that must be considered, e.g. Eprom and EEE, etc.,
- Several members commented that they felt it would likely be necessary to separate requirements in the various codes of NIST Handbook 44.
- It is not reasonable to expect manufacturers to share the technologies used in a public forum such as this meeting and it might be better to speak individually with representatives of the different manufacturers.

At the end of the discussion, a few weighing sector members offered to provide technical expertise to assist OWM in answering any questions that might arise during future development of proposed requirements to address this issue.

At the 2013 Measuring Sector Meeting, the Sector did not support the language “may or may not be necessary” because this phrase changes the category of what is considered “remote configuration capability.” The Sector agreed that, if the card (or other removable device) needs to be a part of the measuring device for normal operation, then the card is effectively part of the device; in that case, the measuring device is a Category 1. If the card is only used for configuration or calibration and is not necessary for the operation of the measuring device, the measuring device is a Category 2. The Sector discussed whether or not additional guidance might be needed on what is covered by each sealing category; however, concluded that the definitions are adequate as currently written.

2014 Regional Association Meetings:

At its 2014 Interim Meeting, CWMA did not receive any comments on this item and believes the item is sufficiently developed. CWMA recommended that the item be a Voting item on the NCWM Agenda. During the 2015 CWMA Annual Meeting, the SMA reported that it looks forward to the further clarification of this item, yet it has concerns about changing metrological parameters without proper re-sealing. The CWMA agreed to recommend the item move forward as a Developing item noting that it supported the continued development of this item.

During open hearing at the 2014 WWMA Annual Meeting and industry representative questioned whether or not this item would affect definitions for other device types. An NCWM representative expressed the opinion that it does affect other devices. The WWMA recommended that this item remain as a Developing item to allow additional input and consideration.

At its 2014 Annual Meeting, SWMA recommended that this item be withdrawn noting it believes this item is not necessary and the existing definition in Appendix D of Handbook 44 is adequate.

At its 2014 Interim Meeting, NEWMA recommended this item be withdrawn noting it believes the existing definition in Appendix D of Handbook 44 is adequate. At the 2015 NEWMA Annual Meeting, no comments were received on this item. NEWMA agreed to recommend the item move forward as a Developing item as OWM continues its work on the proposal.

Additional letters, presentations and data may have been part of the S&T Committee’s consideration. Please refer to <http://www.ncwm.net/meetings/interim/publication> to review these documents.

2014 Grain Analyzer Sector Meeting

At the August 2014 Grain Analyzer sector meeting, the sector considered the responses from NIST OWM, SWMA, WWMA, Measuring Sector and Weighing Sector concerning devices that use SD cards, flash drives or other methods for configuration. The Grain Analyzer Sector agreed that the current proposed language may be confusing and agreed to withdraw their proposal for changes to the definition of remote configuration.

Update for 2015 Grain Analyzer Sector Report:

At the 2015 NCWM Interim Meeting S&T open hearings, Mrs. Tina Butcher (OWM) requested that the Committee reassign this item to OWM noting that the issue identified by the Grain Analyzer Sector had not been resolved. Mrs. Butcher noted that a gap still exists concerning the sealing of equipment in which the sealable parameters of that equipment can be changed by use of a removable digital storage device. She stated that members of OWM’s Legal Metrology Devices Program (LMDP) have agreed to take up this issue after the 2015 Interim Meeting in hopes of being able to develop a proposal that addresses the issue and be able to report on its progress at the next NCWM Conference.

Mr. Michael Keilty (Endress + Hauser Flowtec AG USA) stated he too would be willing to work with OWM on a proposal to address this issue.

The SMA commented that it looks forward to further clarification of this item.

The Committee agreed to reassign this item to OWM for additional development based on OWM's assessment there remains an unresolved issue involving the sealing of equipment using removable digital storage devices.

At the 2015 NCWM Annual Meeting, Mrs. Tina Butcher (OWM) provided an update to the Committee on OWM's progress in developing this item. Mrs. Butcher noted that OWM's Legal Metrology Devices Program (LMDP) had met several times since the 2015 Interim Meeting to work on this issue. Rather than attempting to modify current sealing requirements, which never envisioned this method of adjustment, the LMDP propose creating a separate set of sealing requirements for this technology. Members of the LMDP developed a draft General Code paragraph they believe will address the sealing of devices using this technology to make adjustments. The LMDP requests the following draft General Code paragraph be included in this item to begin generating feedback to assist in further development of this item:

G-S.8.2. Devices Adjusted Using Removable Digital Storage Device. - For devices in which the configuration or calibration parameters can be changed by use of a removable digital storage device, such as a secure digital (SD) card, USB flash drive, etc., security shall be provided by use of an event logger in the device. The event logger shall include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device. In addition to providing a printed copy of the information, the information may be made available electronically. The event logger shall have a capacity to retain records equal to 10 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.)

Mrs. Butcher also noted that OWM plans to propose modifications to a number of the individual device codes in HB 44 to reference the new General Code sealing requirement. The following draft example requirement was developed by the LMDP and included in OWM's written analysis of this item, to provide an indication of how some of the device codes in HB 44 will need to be amended that this type of sealing can be addressed:

Proposed changes to Scales Code paragraph S.1.11. Provision for Sealing:

S.1.11. Provision for Sealing.

S.1.11.1 Devices Adjusted Using a Removable Digital Storage Device. - For those devices adjusted using a removable digital storage device, G-S.8.2. applies.

S.1.11.2 All Other Devices.- Except on Class I scales and devices specified in S.1.11.1. the following provisions for sealing applies:

- (a) *Provision shall be made for applying a security seal in a manner that requires the security seal to be broken before an adjustment can be made to any component affecting the performance of an electronic device.*
[Nonretroactive as of January 1, 1979]
- (b) *A device shall be designed with provision(s) for applying a security seal that must be broken, or for using other approved means of providing security (e.g., data change audit trail available at the time of inspection), before any change that detrimentally affects the metrological integrity of the device can be made to any electronic mechanism.*
[Nonretroactive as of January 1, 1990]
- (c) *Audit trails shall use the format set forth in Table S.1.11.*
[Nonretroactive as of January 1, 1995]

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

(Amended 1989, 1991, and 1993)

As final comment regarding this item, Mrs. Butcher indicated that devices using other means to access adjustments would continue to be addressed by current sealing requirements.

In the 2015 GA report, Sector members were encouraged to review the OWM proposal for changes to NIST HB 44 to address devices that use removable storage devices and provide any additional feedback.

Recommendation (2016 Grain Analyzer Sector):

The sector is asked to comment on the following propose modifications to the Grain Moisture Meter Code Section 5.56.(a) in NIST HB 44, which follows the draft example requirement for the scales code that was developed by the NIST, Legal Metrology Device Program.

Proposed Draft General Code Paragraph:

G-S.8.2. Devices Adjusted Using Removable Digital Storage Device. - For devices in which the configuration or calibration parameters can be changed by use of a removable digital storage device, such as a secure digital (SD) card, USB flash drive, etc., security shall be provided by use of an event logger in the device. The event logger shall include an event counter (000 to 999), the parameter ID, the date and time of the change, and the new value of the parameter. A printed copy of the information must be available on demand through the device or through another on-site device. In addition to providing a printed copy of the information, the information may be made available electronically. The event logger shall have a capacity to retain records equal to 10 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.)

Proposed changes to Grain Moisture Meter Code 5.56(a), paragraph S.2.5. Provision for Sealing:

S.2.5. Provision for Sealing.

S.2.5.1. Devices Adjusted Using a Removable Digital Storage Device. - For those devices adjusted using a removable digital storage device, G-S.8.2. applies.

S.2.5.2. All Other Devices.- Provision shall be made for applying a security seal in a manner that requires the security seal to be broken, or for using other approved means of providing security (e.g., audit trail available at the time of inspection as defined in Table S.2.5. Categories of Device and Methods of Sealing) before any change that affects the metrological integrity of the device can be made to any mechanism.

5. Report on International Organization of Legal Metrology (OIML) TC 17/SC 1 R 59 Moisture Meters for Cereal Grains and Oilseeds

Background / Discussion:

This item is 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 actual 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 (6th CD) 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 6th CD be submitted by June 6, 2013. The U.S. Secretariat collated the U.S. and international comments to the 6th CD 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 6th 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.

During the August 2013 Grain Analyzer Sector meeting the Sector reviewed the proposal to replace the NTEP Publication 14 GMM and NIR Humidity test procedure with the OIML D11 Damp Heat test procedure. It was noted that the proposed changes to the humidity test in Publication 14 were based on OIML D11 requirements Damp heat test, Severity level 1. During discussion of this item, It was mentioned that the temperature and humidity levels as specified in OIML D11 may pose unsafe operating conditions to laboratory staff and also that grain moisture meters are not designed to operate in these extreme conditions. A question was asked if another severity level in D11 would more closely match the testing that is currently in Publication 14 and that has been used for many years in the U.S. Ms. Lee, reviewed OIML D11 requirements following the meeting and found that both severity level 1 and 2 exceed the temperature and humidity levels specified in Publication 14. The Sector agreed by consensus that the OIML D11, Damp heat test, is much too severe for grain moisture meters and that publication 14 should not be changed to meet the requirements of OIML D11.

The U.S. will develop a 7th CD that will be distributed for voting based on comments to the 6th CD, the July 2013 TC17/SC1 meeting and the GA Sector feedback from the August 2013 meeting.

At the August 2014 Grain Analyzer Sector meeting, Ms. Diane Lee, NIST OWM, provided an update on the status of the 7th CD on *Moisture Meters for Cereal Grains and Oilseed*. Ms. Lee reported that the U.S. is nearing completion of the 7th CD on *Moisture Meters for Cereal Grains and Oilseed*. This document will be forwarded to the TC17/SC1 participating and observing countries for a vote and will also be forwarded to participants of the USNWG on Grain Moisture Measuring Devices for vote and comment.

2015 Grain Analyzer Sector Report Update:

The 7th CD on *Moisture Meters for Cereal Grains and Oilseed*. was completed and forwarded to OIML TC 17/SC1 participating and observing countries in December 2014 for a vote by the participating countries by March 2015. The 7 CD received 7 yes votes and 1 no vote with some additional comments. The additional comments will be considered. With a majority “yes” vote from the participating countries, the document will be forwarded as a Draft Recommendation for final voting by the CIML.

2016 Grain Analyzer Sector Meeting:

The OIML R59 was submitted to BIML for registration as a Draft Recommendation and the BIML distributed the Draft Recommendation to all CIML members for preliminary ballot and comment. The total number of votes cast were 25. 23 yes votes, 2 no votes, and 3 abstentions were received, and 32 did not respond. Since a majority of the votes received were in favor of the Recommendation, the TC17/SC1 conveyors, China and U.S. updated OIML R59

(DR) per the editorial comments that were received and BIML registered the Recommendation as a Final Draft Recommendation. The BIML sent the Final Draft Recommendation to CIML members.

Diane Lee forwarded the Final Draft Recommendation and results of the preliminary ballot to the U.S. National Working Group on Grain Moisture Meters on July 26, 2016 via e-mail for review and comments. Many of requirements and test in OIML R 59 are similar to tests conducted in the U.S. Type evaluation program. Some of the test which are typically included in OIML Recommendations such as disturbance tests (AC mains voltage dips, short interruptions, and voltage dips, Burst on AC mains, Radiated radiofrequency, electromagnetic fields, Conducted radiofrequency, electromagnetic fields, and electrostatic discharge) are included in both documents. Many efforts were made to harmonize the OIML R 59 and the OIML Protein Recommendation, but there remains some differences between the two Recommendations which include but are not limited to the following:

- Damp Heat Test and Humidity Test: OIML R 59 includes the humidity test and the procedures used are those that have been used in the U.S. type evaluation testing for many years. The Protein recommendation includes what is called a damp heat test referencing standards IEC 60068-2-78 and IEC60068-3-4.
- Vibration Test: This test is not included in OIML R 59, but is included in the OIML Protein Recommendation.
- Dry Heat and Cold Tests and Instrument Temperature Sensitivity: The protein Recommendation includes a Dry heat test that references IEC 60068-2-2 and IEC 60068-3-1, and a cold test that reference IEC 60068-2-1 and IEC 60068-3-1. OIML R 59 includes the Instrument Temperature Sensitivity Test that includes testing at a cold and hot temperature and are the test procedures used in U.S. Type evaluation testing for many years

During the 51st CIML Meeting to be held on October 17-21, 2016 in Strasbourg, France a final vote will be taken on OIML R 59 (FDR). The publication will be approved if at least 80% of the votes cast are in favour. At least 75% of the Members must be present or represented for the vote. Below is a link to additional information concerning the CIML meeting and a copy of OIML R59 FDR.

<http://strasbourg.oiml.org/ciml.html>

Recommendation:

GA Sector members and members of the U.S. National Working Group on Grain Moisture are asked to review OIML R59 FDR and provide any comments during the GA Sector Meeting.

6. 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 (3rd CD) 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 the 3rd CD were forwarded to the secretariat and the secretariat developed the 4th CD based on these comments.

The 4th CD was circulated to the USNWG on grain protein measuring instruments on April 9, 2013 and comments to the 4th CD of TC 17/SC 8 were requested by June 13, 2013. The U.S. comments to the 4th CD were forwarded to the secretariat. The U.S. was requested to vote on the 4th CD 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 4th CD for the Recommendation on *Protein Measuring Instruments for Cereal Grain and Oil Seeds*. Discussions on 4th CD dealt mostly with harmonization of testing with the 6th CD of the OIML Recommendation R59 *Moisture Meters for Cereal Grain and Oilseeds*, software requirements, and influence quantities and test sample temperature.

At the August 2013 Grain Analyzer Sector meeting, the Sector reiterated their concerns with the OIML D11 damp heat test and agreed that the damp heat test in OIML Recommendation on Protein Measuring Instruments for Cereal Grain and Oil Seeds, 4th CD should be replaced with the humidity test as written in OIML R59 CD6.

The TC17/SC8 Secretariat will distribute a 5th CD for voting.

At the August 2014 Grain Analyzer Sector meeting, Ms. Diane Lee, NIST OWM, provided an update on the status of the 5th CD on *Protein Measuring Instruments for Cereal Grain and Oil Seeds*. The 5th CD on *Protein Measuring Instruments for Cereal Grain and Oil Seeds* was sent via e-mail to the USNWG on Protein Measuring Device on August 26, 2014 for a vote and comments. The USNWG participants were requested to provide their vote and any comments to the 5th CD by October 14, 2014. Ms. Lee encouraged the Grain Analyzer Sector members that are also participating on the USNWG to provide a vote and any comment to the 5th CD on *Protein Measuring Instruments for Cereal Grain and Oil Seed*.

2015 Grain Analyzer Sector Report Update:

The U.S. provided a yes vote on the 5th CD of the Protein Measuring Instruments for Cereal Grain and Oil Seeds with a comment to remove the vibration test from the document. The 5th CD of the Protein Measuring Instruments for Cereal Grains and Oil Seeds received a majority “yes” vote from the participating countries. With a majority “yes” vote by the participating countries, the document was forwarded as a Draft Recommendation for final voting by the CIML. Prior to the U.S. CIML member providing the U.S. vote, Diane lee circulated the DR to the USNWG and requested any final comments by October 11, 2015.

2016 Grain Analyzer Sector Meeting:

The OIML Protein Recommendation was submitted to BIML for registration as a Draft Recommendation and the BIML distributed the Draft Recommendation to all CIML members for preliminary ballot and comment. The total number of votes cast were 22. 20 yes votes, 2 no votes, and 1 abstention were received and 38 did not respond. Since a majority of the votes received were in favor of the Recommendation, The TC17/SC8 conveynor, Australia, updated the OIML Protein Recommendation (DR) per the editorial comments that were received and BIML registered the Recommendation as a Final Draft Recommendation. The BIML sent the Final Draft Recommendation to CIML members. Diane Lee forwarded the Final Draft Recommendation and results of the preliminary ballot to the U.S. National Working Group on Protein Meters on July 26, 2016 via e-mail for review and comments. Many of requirements and test in OIML the Protein Recommendation are similar to tests conducted in the U.S. Type evaluation program. Some of the test which are typically included in international recommendations such as disturbance tests (AC mains voltage dips, short interruptions, and voltage dips, Burst on AC mains, Radiated radiofrequency, electromagnetic fields, Conducted radiofrequency, electromagnetic fields, and electrostatic discharge) are included in both the OIML Protein Recommendation and OIML R59. Many efforts were made to harmonize the the OIML Protein Recommendation and OIML R 59, but there remains some differences between the two Recommendations which include but are not limited to the following:

- Damp Heat Test and Humidity Test: OIML R 59 includes the humidity test and the procedures used are those that have been used in the U.S. type evaluation testing for many years. The Protein recommendation includes what is called a damp heat test referencing standards IEC 60068-2-78 and IEC60068-3-4.
- Vibration Test: This test is not included in OIML R 59, but is included in the OIML Protein Recommendation.

- Dry Heat and Cold Tests and Instrument Temperature Sensitivity: The protein Recommendation includes a Dry heat test that references IEC 60068-2-2 and IEC 60068-3-1, and a cold test that reference IEC 60068-2-1 and IEC 60068-3-1. OIML R 59 includes the Instrument Temperature Sensitivity Test that includes testing at a cold and hot temperature and are the test procedures used in U.S. Type evaluation testing for many years

During the 51st CIML Meeting to be held on October 17-21, 2016 in Strasbourg, France a vote will be taken on the OIML Protein Recommendation (FDR) and the publication will be approved if at least 80% of the votes cast are in favour; at least 75% of the Members must be present or represented for the vote.

Below is a link to additional information concerning the CIML meeting and a copy of the OIML Recommendation on Protein.

<http://strasbourg.oiml.org/ciml.html>

Recommendation:

Grain Analyzer Sector members and members of the U.S. National Working Group on Protein Meters are asked to review the OIML Recommendation on Protein (FDR) and provide any comments during the Grain Analyzer Sector Meeting.

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

Source:

Dr. Hurburgh, Iowa State University

Background/Discussion:

The GIPSA Grain Inspection 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.

Ms. Eigenmann provided an update on the Grain Inspection Advisory Committee’s Resolutions. The Sector discuss the feasibility of an ongoing calibration program also referred to as a Phase II program for Near Infrared Grain Analyzers (NIR) instruments that measure wheat program. The Phase II program for grain moisture is a program that monitors the moisture calibrations on grain moisture meters annually. As changes to the calibrations occur due to grains, climate, etc., data collected in this program allows for changes to moisture calibrations annually and ensure equivalency among the different moisture meter models. The Advisory committee is recommending that this program be extended to include NIR instruments that measure wheat protein. It was noted that there could be multiple NIR instruments for wheat protein introduced into the market and that it may be advisable to have the Phase II program extended to NIR instruments that measure wheat protein. It was also mentioned that currently there are few States that are checking wheat protein on multi-constituent instruments.

GIPSA currently has an annual review program for the official protein system but would have to consider the cost associated with extending the program for other NIR wheat protein analyzers. It was noted during the discussion that GIPSA currently has hourly rate fees set that could be applied to a phase II program for wheat program.

Unlike moisture where there may be changes to the calibrations annually, there will not be year to year changes for wheat protein. As such, consideration may be given to conducting the program less than annually, and considering reviewing wheat protein calibrations every 3, 4, or 5 years, as appropriate. In addition it was noted that there also has to be a mechanism to get manufacturers calibration data for calibration review.

The sector will continue to discuss the feasibility of a phase II program for wheat protein giving consideration to the following issues:

- How the program will be funded,
- How often the calibrations for wheat protein will be updated,
- How many devices are currently being used in commercial transactions, and
- If being used commercially in a State, what is needed by States to begin testing these devices?

At the August 2014 Grain Analyzer Sector meeting USDA, GIPSA representatives provided an update on the activities concerning a phase II program for wheat protein. The Sector was informed that USDA, GIPSA is discussing funding options for this program. It was noted that the frequency of calibration for wheat protein is being considered and that this will impact the cost of the program. The Sector was also informed that Dr. David Funk is writing a discussion paper that will address many of the issues concerning a Phase II program for wheat protein.

2015 Grain Analyzer Sector Report Update:

USDA, GIPSA representatives mentioned that they are not aware of a discussion paper from Dave Funk concerning the feasibility of a Phase II program for Near Infrared Grain Analyzers. The sector should continue to provide feedback on the four bullet items listed above and USDA, GIPSA should provide any updates on any internal discussions.

2016 Grain Analyzer Sector Meeting

Mr Jordan, GIPSA, the NTEP Participating Laboratory for grain analyzers provided information on some work involving applying data transforms to spectra of multiple instrument models. Mr. Jordan will provide an update of these activities along with others involved in considering Phase II testing for Near Infrared Grain Analyzers.

Recommendation:

Sector members are asked to review the background information on this item in preparation for discussion of the current work in determining the feasibility of Phase II testing for Near Infrared Grain Analyzers.

8. State Weights and Measures Issues with Inspection of Grain Moisture Meter for Corn

Source:

G. Diane Lee, NIST, OWM, Legal Metrology Device Group

Background / Discussion:

Diane Lee, NIST OWM received calls requesting a copy of the annual request for grain samples and list of grains that GIPSA request from States to include in the ongoing calibration program. These request came from various States and other interested parties. One State reported seeing a difference between a UGMA meter and another meter on corn samples and wanted to ensure that grain samples in their State were represented in the ongoing calibration program.

Recommendation:

Grain Analyzer Sector members are asked to report on any issues they are having with commercial grain moisture meter inspections for corn.

Next Sector Meeting

The next meeting is tentatively planned for Wednesday, August 16 and Thursday, August 17, 2017, at the Chase Suites by Woodfin at KCI in Kansas City, MO. or the Hyatt Place at the Kansas City Airport. Sector members are asked to hold these days open pending confirmation of availability of facility, determination of agenda items, exact meeting times, and meeting duration. Final meeting details will be announced by early June 2017.

If you would like to submit an agenda item for the 2017 meeting, please contact any of the following persons by June 1, 2015:

Jim Truex, NTEP Administrator at jim.truex@ncwm.net
G. Diane Lee, NIST Technical Advisor, at diane.lee@nist.gov