Appendix B

National Type Evaluation Technical Committee
Grain Analyzer Sector

August 23 - 24, 2006, Kansas City, Missouri
Meeting Summary

Agenda Items

Details of All Items
(In Order by Reference Key Number)

1. Report on the 2006 NCWM Interim and Annual Meetings

The 91st Interim Meeting of the National Conference on Weights and Measures (NCWM) was held January 22 - 25, 2006, in Jacksonville, Florida. Steve Patoray, NTEP Director, reported that the NTEP Committee accepted the Sector's recommended amendments and changes to the 2005 edition of the Grain Moisture Meter (GMM) chapter of Publication 14. These changes appear in the 2006 edition. For additional background, refer to *Committee Reports for the 91st Annual Meeting,* NCWM Publication 16, April 2006.

Amendments and Changes to the 2005 Edition of the Grain Moisture Meter Chapter of Publication 14			
Section Number	**Amendment/Change**	**Page**	**Source**
Section IV. Tolerances for Calibration Performance	Correct language	GMM-7	08/05 GMM Sector Item 8
Section V. Criteria for NTEP Moisture Calibration Review	Add language for Multi-Class Calibration in Case VIII	GMM-9	08/05 GMM Sector Item 8
Appendix D. Sample Temperature Sensitivity	Correct table	GMM-44	08/05 GMM Sector Item 9

The 91st Annual Meeting of the NCWM was held July 9 - 13, 2006, in Chicago, Illinois. No Grain Moisture Meter (GMM) or Near Infrared (NIR) Grain Analyzer items were presented for consideration by the NCWM at the 2006 Annual Meeting.

Steve Patoray reported that the Board of Directors, on behalf of NCWM, Inc., had signed a Declaration of Mutual Confidence (DoMC) with the International Organization of Legal Metrology (OIML) as a "utilizing participant" for OIML R 60 (Load Cells). He explained that a DoMC is an agreement, signed by various bodies in charge of legal metrology activities in different countries, by which a signing country declares it will voluntarily accept test results of type evaluations conducted according to the OIML Recommendations for a specific category of instruments. A "utilizing participant" accepts OIML Evaluation Reports validated by OIML Certificates but does not issue any OIML Test Reports or OIML Certificates under the DoMC. While this specific action does not directly affect grain analyzers, Mr. Patoray pointed out it does show why the harmonization of International Standards (OIML) and U.S. Standards (NIST Handbook 44 and NCWM Publication 14) is increasingly important. Instrument manufacturers may eventually be able to facilitate the type approval of their instruments in various countries, using the "one-stop testing" concept.

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

Cathy Brenner of the Grain Inspection, Packers, and Stockyards Administration (GIPSA), the NTEP participating laboratory for grain analyzers, reported on NTEP type evaluation activity. In addition to regular grain moisture meter calibration updates, evaluations are currently underway for two additional devices: one for test weight per bushel (an add-on to a currently approved grain moisture meter); and one for a new grain moisture meter. She also reported that the following device types would be enrolled in the OCP (Phase II) for the 2006 harvest:

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

DICKEY-john Corporation	GAC2000, GAC2100, GAC2100a, GAC2100b
DICKEY-john Corporation	OmegAnalyzer G
Foss North America	Infratec 1241
Foss North America	Infratec 1227, Infratec 1229
Seedburo Equipment Company	1200A
The Steinlite Corporation	SL95

Ms. Brenner noted that there are now six devices, and the cost to manufacturers for Phase II has increased from $ 5,300 to $ 7,730 per meter type.

NTEP On-Going Calibration Program Fee Schedule For Fiscal Years 2005-2009							
(1) Total Meters (including official meter)	(2) Meters in NTEP Pool	(3) Cost per NTEP Pool Meter	(4) Total Program Cost	Funding Contribution from Participants			
				(5) NIST	(6) GIPSA	(7) Manufacturers (total funding from mfg's)	(8) Cost per Meter Type
2	1	$ 19,875	$ 19,875	$ 6,625	$ 6,625	$ 6,625	$ 3,315
3	2	19,875	39,750	13,250	13,250	13,250	4,415
4	3	19,875	59,625	19,875	19,875	19,875	4,970
5	4	19,875	79,500	26,500	26,500	26,500	5,300
6	5	19,875	99,375	26,500	26,500	46,375	7,730
7	6	19,875	119,250	26,500	26,500	66,250	9,465
8	7	19,875	139,125	26,500	26,500	86,125	10,765
9	8	19,875	159,000	26,500	26,500	106,000	11,775

3. Review of On-going Calibration Program (Phase II) Performance Data

At their August 2005 meeting, the Sector agreed that comparative OCP performance 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, Cathy Brenner, representing GIPSA, the NTEP participating laboratory for grain analyzers, presented data showing the performance of NTEP meters compared to the air oven. These data were based on the last 3 crop years (2003 - 2005) using calibrations updated for use during the 2006 harvest season. Noting that the X-axis for Durum Wheat covered a range of 8 % to 18 % moisture although no samples had been received in the 16 % to 18 % interval, Ms. Brenner explained that the moisture intervals (ranges) shown for each grain are the same as those listed on GIPSA Program Directive 9180.61 for the Official Meter. Using a fixed X-axis for individual grain types makes it easier to make meaningful visual comparisons in the results for successive 3-year periods.

In response to a question of why the "sustained bias" rule hadn't been applied to the Official Meter's calibration for corn, Dr. Richard Pierce, GIPSA, explained that as long as the meters are within the allowed tolerance for "sustained bias" there is no requirement to change the calibration.

The Sector acknowledged the effort that had gone into the compilation and presentation of the comparative performance data and thanked Cathy Brenner for a job well done.

4. Proposed Change to Publication 14 – Bias Tolerances for Test Weight per Bushel

Background: This is a carry-over item from the Sector's August 2005 meeting; see the summary of that meeting for additional information.

The Grain Moisture Meter (GMM) Chapter of Publication 14 calls for testing the automatic test weight per bushel (TW) measuring feature of GMMs for accuracy, repeatability (precision), and reproducibility using 12 selected samples of each grain type (for which the meter has a pending or higher moisture calibration). The two tests for accuracy between the meter and the standard reference method are bias (meter versus the standard reference method) and the standard deviation of the differences (SDD). Publication 14 states that, "The manufacturer may adjust the calibration bias to compensate for differences from the type evaluation laboratory in reference methods or sample sets."

Recent NTEP tests revealed that the results of the bias test, which uses only 12 selected samples, are sample set dependent. Because of this, the NTEP Lab did not list specific bias terms for each grain type on the Certificate of

Conformance (CC) for instruments recently evaluated for test weight (TW). Instead, the CC simply indicated that the meter is approved for test weight per bushel measurements for each grain type verified for test weight.

NIST Handbook 44, Section 5.56.(a) Grain Moisture Meters Code, stipulates:

> **S.2.4.3. Calibration Transfer** - *The instrument hardware/software design and calibration procedures shall permit calibration development and the transfer of calibrations between instruments of like models without requiring user slope or bias adjustments.*

This requirement applies to both moisture and TW calibrations. In devices where grain-dependent TW calibration coefficients are imbedded in the CC listing of grain moisture calibration coefficients, there is no problem. Any change in coefficients affecting TW will require a change in the moisture calibration and an amendment to the CC. The concern is with devices that do not treat grain-dependent TW coefficients as part of the moisture calibration. In that case, unless TW coefficients are listed on the CC, there is no way for field inspectors to know if the most recent adjustment coefficients are being used for test weight. The Sector agreed that if TW calibration coefficients are not part of the moisture calibration coefficients then they must be listed on the CC.

The Sector was in general agreement that TW data from the On-going Calibration Program (OCP), (Phase II, was the best measure of how closely a meter is biased to the standard quart kettle method. In response to a question of whether or not Phase II TW data for corn for the entire moisture range or for a restricted (and lower) moisture range should be used, Dr. Pierce replied that TW data above 20 % moisture would not be used.

At its August 2005 meeting, the Sector agreed that the Grain Moisture Meter chapter of Publication 14 should be amended using the following guidelines:

1. The bias test for TW accuracy will be retained.
2. Data from the Phase II On-going Calibration Review Program may be used at the manufacturer's discretion to support a grain-specific TW bias-adjustment change in a TW calibration. TW data for corn will be limited to samples with oven moistures not exceeding 20 %.
3. A new Phase I evaluation is NOT required for a grain-specific TW bias-adjustment change in a TW calibration supported by Phase II data.
4. Any change in a grain-specific TW calibration must be reflected on the CC in a manner obvious to field inspectors.
5. The bias results for TW accuracy for each of the two instruments of like-type submitted for evaluation must agree with each other by the same tolerance that they must agree with the reference method.

The Sector's co-technical advisor, Mr. Jack Barber, was directed to draft proposed wording for the amendment for consideration by the Sector at its August 2006 meeting.

Discussion: The Sector reviewed the proposed amendments to Section VII of Publication 14 to address criteria for TW calibration, which was provided in the 2006 meeting agenda. Cathy Brenner, representing GIPSA, the NTEP Participating Laboratory for Grain Analyzers, reported that based on historical data, meters passing the existing Phase I Test Weight per Bushel (TW) test for bias also passed the proposed test for Δ bias (see guideline 5, above). Furthermore, the majority of the times a meter failed the existing test for TW Bias they passed the test for Δ bias. The few times when a meter also failed the proposed Δ bias test, there was a problem with one of the instruments. The Sector concluded that the proposed test for Δ bias was both redundant and ineffective. Portions of the proposed amendment related to Δ bias were deleted.

One sector member questioned if it was really possible to identify how a meter was configured to measure TW or if there was an identifiable TW calibration on a meter. Mr. Barber explained that the steps involved in arriving at a TW value include: 1) measuring the weight of the grain in the meter's test cell (or separate test "cup"); and 2) converting the measured weight into an equivalent pounds per bushel figure assuming that the test cell volume is constant. Unfortunately, the conversion step is grain specific. The packing density of grain is influenced by the size and shape of the kernels of grain; by the size and shape of the test cell; by the surface condition of the grain; by the distance the grain drops as it loads into the cell; and by the size of the sample being dropped. Additionally, the effective volume of grain being weighed will vary by grain type due to the way the device "strikes off" or removes

excess grain from the top of the test cell. As a result, meters use empirically determined grain-specific constants to convert the measured weight into pounds per bushel. The constant is typically a "slope" term in the TW calibration. An additional grain-specific constant, a "bias" or "intercept" term, is sometimes used to provide a "best fit" over the range of available samples.

Answering manufacturer's questions concerning how to handle device-specific adjustments/parameters that were also grain specific, the co-technical advisor, Diane Lee, cited the following paragraphs from Section 5.56.(a) of NIST Handbook 44, noting that the code differentiates between "grain calibrations" (typically the grain specific constants that are identical for all devices of like type) and "standardization adjustments" (the device specific adjustments or software parameters that make all devices of like type respond identically to the grain being measured when using the same calibrations.)

S.2.4. Calibration Integrity

S.2.4.1. Calibration Version. - A meter must be capable of displaying either calibration constants, a unique calibration name, or a unique calibration version number for use in verifying that the latest version of the calibration is being used to make moisture content and test weight per bushel determinations.
(Added 1993) (Amended 1995 and 2003)

S.2.4.2. Calibration Corruption. - If calibration constants are digitally stored in an electronically alterable form, the meter shall be designed to make automatic checks to detect corruption of calibration constants. An error message must be displayed if calibration constants have been electronically altered.
(Added 1993) (Amended 1995)

S.2.4.3. Calibration Transfer. - *The instrument hardware/software design and calibration procedures shall permit calibration development and the transfer of calibrations between instruments of like models without requiring user slope or bias adjustments.*

*[**Note**: Only the manufacturer or the manufacturer's designated service agency may make standardization adjustments on moisture meters. This does not preclude the possibility of the operator installing manufacturer-specified calibration constants under the instructions of the manufacturer or its designated service agency.] Standardization adjustments (not to be confused with grain calibrations) are those physical adjustments or software parameters which make meters of like type respond identically to the grain(s) being measured.*
[Nonretroactive as of January 1, 1999]
(Added 1994) (Amended 1998)

The Sector engaged in a lengthy discussion. One faction was of the opinion that the Type Evaluation for TW (Phase I) was a one-time evaluation and should not be extended into Phase II with a required annual report. They suggested that manufacturers be permitted to make TW calibration changes at their own discretion supported by existing Phase II or manufacturer-supplied data. Field-testing of TW could be used to determine if individual devices were in compliance. The opposing faction was equally firm in believing if it was important enough for a manufacturer to change a TW calibration, it was important enough to set tolerance limits for performance based on the largest set of data available and to ensure that it could be verified in the field that the calibration changes have been made to all devices of like type in use.

An attempt was made to find a common ground between these two positions. The compromise proposal eliminated performance tolerances but retained the following paragraphs:

Test-weight-per-bushel data from Phase II may be used at the manufacturer's discretion to support a grain-specific bias adjustment change in a test weight per bushel calibration. A repeat of the basic instrument tests and the accuracy, precision, and reproducibility tests cited previously is not required for a grain-specific bias-adjustment change in a test weight per bushel calibration supported by Phase II data.

Any change in a grain-specific test-weight-per-bushel calibration (including changes in grain-specific bias adjustments) must be reflected on the CC in a manner obvious to field inspection personnel.

Steve Patoray, NTEP Director, pointed out that as far as NTEP Publication 14 was concerned, Phase II TW data doesn't exist. [Editor's note: The TW data currently being supplied to manufacturers along with Phase II moisture results are being collected by GIPSA as an internal matter and are being provided to manufacturers as a courtesy.] Consequently, the compromise proposal cannot refer to "Test-weight-per-bushel data from Phase II." With that revelation the Sector agreed by consensus to the original proposal modified only by reducing the tolerances of paragraph III.C.b. to 0.40 for corn and oats; 0.25 for wheat; and 0.35 for all other grains.

It was suggested that CCs include a note telling field inspectors how to determine if the most recent TW calibration had been installed. For example, should the inspector be looking for a specific calibration identifier, or were TW calibration coefficients embedded in the listed moisture calibration coefficients?

Recommendation: Amend Section VII. Additional Type Evaluation Test Procedures and Tolerances for Grain Moisture Meters Incorporating an Automatic Test Weight per Bushel Measuring Feature of the 2006 edition of the GMM chapter of NCWM Publication 14 as follows, to define calibration performance requirements on the basis of data collected as part of the on-going national moisture calibration program.

VII. Additional Type Evaluation Test Procedures and Tolerances for Grain Moisture Meters Incorporating an Automatic Test Weight per Bushel Measuring Feature

A. Basic Instrument Tests:

B. Accuracy, Precision, and Reproducibility

C. Tolerances for Test Weight per Bushel Calibration Performance:

In addition to the Basic Instrument Tests and the Accuracy, Precision, and Reproducibility Tests cited previously, test weight per bushel calibration performance will be monitored using test weight per bushel data collected as part of the on-going national moisture calibration program (Phase II). Evaluation of test weight per bushel performance for corn will be limited to data collected on samples with moisture content not exceeding 20 % as determined by the USDA air-oven reference method.

For up to 3 years of available test weight per bushel data:

a. The difference between the average bias to quart kettle for all samples in a given year and the average bias to quart kettle for any other year shall not exceed 0.80 for corn and oats; 0.50 for wheat; and 0.70 for all other grains.

b. The average calibration bias with respect to quart kettle shall not exceed 0.40 for corn and oats; 0.25 for wheat; and 0.35 for all other grains calculated using the most recent calibration and all available raw data collected within the last 3 years for the entire moisture range (data for corn samples above 20 % moisture will be excluded.)

Failure to meet the requirements in either item a. or b. above will cause removal of test weight per bushel approval status for the affected grain type(s) on the NTEP Certificate of Conformance (CC) for that instrument.

Test weight per bushel data from Phase II may be used at the manufacturer's discretion to support a grain-specific bias adjustment change in a test weight per bushel calibration. A repeat of the basic instrument

tests and the accuracy, precision, and reproducibility tests cited previously is not required for a grain-specific bias-adjustment change in a test weight per bushel calibration supported by Phase II data.

Any change in a grain-specific test weight per bushel calibration (including changes in grain-specific bias adjustments) must be reflected on the CC in a manner obvious to field inspection personnel.

5. Proposed Amendment to Handbook 44 Section 5.56.(a) to Address Minimum Acceptable Abbreviations for Multi-Class Grain Moisture Calibrations

Discussion: NIST Handbook 44, Section 5.56.(a) paragraph S.1.2. Grain or Seed Kind and Class Selection and Recording requires that, "The means to select the kind and class of grain or seed shall be readily visible and the kind and class of grain or seed selected shall be clearly and definitely identified." The GMM chapter of NCWM Publication 14 was recently amended to allow multi-class moisture calibrations. A multi-class grain calibration that includes all the NTEP classes of that grain type (e.g., two-rowed barley and six-rowed barley) can clearly and definitely be identified by a single type name (e.g., barley). Similarly, both long grain and medium grain rough rice could be identified unambiguously as "rough rice". However, a multi-class grain calibration that does not include all of the NTEP classes of a grain type may not be clearly and definitely identified using a single grain type name (e.g., wheat). For example, a calibration for "all wheat except durum" cannot be labeled "wheat" because the grain type "wheat" does not include "durum wheat." The acceptable abbreviations (and grain names) in Table S.1.2. of Handbook 44 do not address the groupings and the names that might be used for selecting and recording multi-class calibrations.

Conclusions and Recommendation: The Sector decided that the originally suggested multi-class groups (soft wheat, hard wheat, red wheat, and white wheat) were thought to be confusing and subject to potential misuse. Only the following multi-class groups should be considered for type evaluation:

All-class Wheat
Wheat excluding Durum
All-class Barley
All-class Rough Rice

A poll of manufacturers present at the meeting revealed that increasing the four-character display requirement of paragraph S.1.2. to eight characters would not be a problem with instruments in current production; therefore, up to eight characters could be used for multi-class group abbreviations. The Sector decided that the sentence specifying the display capacity was not needed because the necessary display capacity was obvious from the number of characters in the longest minimum acceptable abbreviation listed in Table S.1.2.

The Sector agreed that the above multi-class groups should be added to Table S.1.2. and that paragraph S.1.2. should be modified as necessary to accommodate multi-class grain moisture calibrations.

The Sector agreed to recommend the following modifications to paragraph S.1.2. Grain or Seed Kind and Class Selection and Recording and Table S.1.2. of Section 5.56.(a) of NIST Handbook 44 to include minimum acceptable abbreviations for multi-class grain moisture calibrations.

S.1.2. Grain or Seed Kind and Class Selection and Recording. – Provision shall be made for selecting and recording the kind and class *or multi-class group* (as appropriate) of grain or seed to be measured. The means to select the kind and class *or multi-class group* of grain or seed shall be readily visible and the kind and class *or multi-class group* of grain or seed selected shall be clearly and definitely identified. Abbreviations for grain types *and multi-class groups* indicated on the meter must meet the minimum acceptable abbreviations listed in Table S.1.2.~~Meters shall have the capability (i.e., display capacity) of indicating the grain type using a minimum of four characters in order to accommodate the four character abbreviations listed in Table S.1.2.~~
(Amended 1993, ~~and~~1995, and 2008)

Table S.1.2. Grain Types and Multi-Class Groups Considered for Type Evaluation and Calibration and Their Minimum Acceptable Abbreviations			
Grain Type	***Minimum Acceptable Abbreviation***	***Grain Type***	***Minimum Acceptable Abbreviation***
Corn	*CORN*	*Soybeans*	*SOYB*
Durum Wheat	*DURW*	*Two-rowed Barley*	*TRB*
Soft White Wheat	*SWW*	*Six-rowed Barley*	*SRB*
Hard Red Spring Wheat	*HRSW*	*All-class Barley**	*BARLEY*
Hard Red Winter Wheat	*HRWW*	*Oats*	*OATS*
Soft Red Winter Wheat	*SRWW*		
Hard White Wheat	*HDWW*		
*All-Class Wheat**	*WHEAT*		
*Wheat excluding Durum**	*WHTEXDUR*		
Sunflower seed (Oil)	*SUNF*	*Long Grain Rough Rice*	*LGRR*
		Medium Grain Rough Rice	*MGRR*
		*All-class Rough Rice**	*RGHRICE*
Grain Sorghum	*SORG or MILO*	*Small oil seeds (under consideration)*	

[Note: Grain Types marked with an asterisk (*) are "Multi-class Calibrations"]
[Nonretroactive as of January 1, 1998]
(Table Added 1993) (Amended 1995, ~~and~~1998, 2008)

[Editors Note: In preparing this item for the NCWM S&T review it was determined that the term "Multi-class" is not a widely used term. The Sector may want to consider developing a definition for multi-class calibrations.]

6. Proposed Changes to Handbook 44 and Publication 14 to Address Multi-Class Calibrations (other than moisture) for Near Infrared Grain Analyzers

Background: The GMM chapter of NCWM Publication 14 was recently amended to allow multi-class moisture calibrations. In conjunction with agenda Item 5, the Sector recommends modifications to the GMM Code of Handbook 44 to specify allowed multi-class groupings when user selection of a multi-class group is performed using the group name or an abbreviation of the name. The NIR Grain Analyzer program allows for either individual-class calibrations or "all-class" calibrations for constituents other than moisture, but does not have any provisions for multi-class calibrations for those constituents.

Conclusions/Recommendation: The Sector agreed that modifications should be made to the NIR Grain Analyzer Code of Handbook 44 and the corresponding sections of Publication 14 to correspond with changes recommended in agenda Item 5 in order to cover multi-class moisture calibrations.

The Sector recommends the following modifications to item (a) below in paragraph S.1.2. *Selecting and Recording Grain Class and Constituent* and Table S.1.2. of Section 5.57 of NIST Handbook 44, and to item (b) to amend Section III. Accuracy, Precision, and Reproducibility Requirements in the 2005 edition of the GMM chapter of NCWM Publication 14 to add criteria applicable to "multi-class" calibrations. Proposed additions and changes are shown below:

(a) Proposed Changes to Section 5.57 of NIST Handbook 44:

S.1.2. Selecting and Recording Grain Class and Constituent. *- Provision shall be made for selecting and recording the type or class of grain and the constituent(s) to be measured. The means to select the grain type or class and the constituent(s) shall be readily visible and the type or class of grain and the constituent(s) selected shall be clearly and definitely identified in letters (such as HRWW, HRSW, WHEAT etc. or PROT, etc.). A symbol to identify the display of the type or class of grain and constituent(s) selected is permitted provided it is clearly defined adjacent to the display. Minimum acceptable abbreviations are listed in*

Table S.1.2.~~Meters shall have the capability (i.e., display capacity) of indicating the grain type using a minimum of four characters in order to accommodate the abbreviations listed in Table S.1.2.~~
[Nonretroactive as of January 1, 2003]

If more than one calibration is included for a given grain type, the calibrations must be clearly distinguished from one another.
[Nonretroactive as of January 1, 2004]

Table S.1.2. Grain Types Considered for Type Evaluation and Calibration and Minimum Acceptable Abbreviations	
Grain Type	***Minimum Acceptable Abbreviation***
Durum Wheat	*DURW*
Hard Red Spring Wheat	*HRSW*
Hard Red Winter Wheat	*HRWW*
Hard White Wheat	*HDWW*
Soft Red Winter Wheat	*SRWW*
Soft White Wheat	*SWW*
*All-Class Wheat**	*WHEAT*
*Wheat excluding Durum**	*WHTEXDUR*
Soybeans	*SOYB*
Two-rowed Barley	*TRB*
Six-rowed Barley	*SRB*
*All-Class Barley**	*BARLEY*
Corn	*CORN*

[Note: Grain Types marked with an asterisk (*) are "Multi-class Calibrations"]
[Nonretroactive as of January 1, 2003]
(Table Amended 2001 and 2008)
(Amended 2003 and 2008)

(b) Proposed Changes to the NIR Grain Analyzer Chapter in the 2006 Edition of Publication 14:

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 to 18 at 12 % M.B.	10 % - 12 %	13 % - 15 %
Hard Red Spring Wheat	Protein	10 to 19 at 12 % M.B.		
Hard Red Winter Wheat	Protein	8 to 18 at 12 % M.B.		
Hard White Wheat	Protein	9 to 16 at 12 % M.B.		
Soft Red Winter Wheat	Protein	9 to 12 at 12 % M.B.		
Soft White Wheat	Protein	8 to 15 at 12 % M.B.		
"All Class" Wheat Calibration*	Protein	8 to 19 at 12 % M.B.		
Wheat Excluding Durum*	Protein	8 to 19 at 12 % M.B.		
Two-rowed Barley	Protein	8 to 17 at 0 % M.B.	10 % - 12 %	13 % - 15 %
Six-rowed Barley	Protein	8 to 17 at 0 % M.B.		
"All Class" Barley Calibration*	Protein	8 to 17 at 0 % M.B.		
Corn	Protein	8 to 12 at 0 % M.B.	11 % - 13 %	14 % - 16 %
	Oil	3 to 9 at 0 % M.B.		
	Starch	67 to 73 at 0 % M.B		
Soybeans	Protein	30 to 40 at 13 % M.B.	10 % - 12 %	13 % - 15 %
	Oil	16 to 21 at 13 % M.B.		

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

Table 2. Tolerances

Grain Type	Constituent	Sample Temperature Sensitivity Test Tolerance	Accuracy Tolerance	Repeatability Tolerance	Reproducibility Tolerance
Durum Wheat	Protein	± 0.35	0.30	0.15	0.20
Hard Red Spring Wheat	Protein				
Hard Red Winter Wheat	Protein				
Hard White Wheat	Protein				
Soft Red Winter Wheat	Protein				
Soft White Wheat	Protein				
"All Class" Wheat Calibration*	Protein				
Wheat Excluding Durum*	Protein				
Two-rowed Barley	Protein	± 0.45	0.40	0.20	0.25
Six-rowed Barley	Protein				
"All Class" Barley Calibration*	Protein				
Corn	Protein	± 0.45	0.50	0.25	0.30
	Oil	± 0.45	0.50	0.20	0.25
	Starch	± 0.45	1.0	0.30	0.35
Soybeans	Protein	± 0.45	0.55	0.25	0.30
	Oil	± 0.45	0.45	0.20	0.25

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

Two instruments will be tested using test sets consisting of no less than 50 samples for each grain type to be used on the instrument submitted for type approval. (Note: In cases where grain types have multiple constituent calibrations, more than 50 samples may be required to satisfy the range requirements for each constituent associated with that grain type.) The sample set will be screened using the GIPSA official instrument model and reference method. Samples where the official instrument model disagrees from the reference method by more than the Handbook 44 acceptance tolerance will be deleted and another sample will be selected to replace it. No sample set will be used where the standard deviation of the differences between the GIPSA official instrument model and the reference method exceeds one-half the Handbook 44 acceptance tolerance applied to individual samples. Finally, any sample result not within three standard deviations of the mean for the test instrument will be dropped before analysis of the data.

Three replicates will be run on each instrument for each sample, resulting in a minimum of 300 observations per constituent calibration (2 instruments x 50 samples [minimum] x 3 replicates).

Accuracy. The first replicate for each sample will be used to calculate the Standard Error of Performance (SEP) for each instrument with respect to the reference method. Each instrument will be tested individually. The equation to calculate SEP is:

where $$SEP = \sqrt{\frac{\sum_{i=1}^{n}(y_i - \bar{y})^2}{n-1}}$$

x_i = predicted constituent concentration for the first replicate of sample *i*

r_i = reference constituent concentration for sample *i*

$y_i = x_i - r_i$

$\bar{y}$ = average of y_i

n = number of samples in the test set for the constituent calibration being evaluated (n = 50, see Note 1 below regarding "all class" calibrations.)

The tolerance for SEP is shown in Table 2.

If requested by the applicant, data from a 20-sample slope set will be provided for adjusting calibration slope and bias prior to the start of type evaluation testing. No further standardization adjustments will be made during type evaluation testing.

Note 1: ~~"All-class"~~"Multi-class" calibrations will be tested using full test sets for all included classes (50 x number of classes). In addition to meeting accuracy requirements (SEP) for the test sets of each individual class, for publication ~~"all-class"~~"Multi-class" calibrations must meet the accuracy requirements (SEP) when the data from all included classes are pooled.

Note 2: A single slope and bias will be used for ~~"all-class"~~ "multi-class" calibrations.

Repeatability. The Standard Deviation (SD) of the three replicates will be calculated and pooled across samples for each class. Each instrument will be tested individually. The equation used to calculate SD is:

where $$SD = \sqrt{\frac{\sum_{i=1}^{n}\sum_{j=1}^{3}(P_{ij} - \bar{P}_i)^2}{2n}}$$

P_{ij} = predicted constituent concentration for sample i and replicate j

$\bar{P}_i$ = average of the three predicted constituent concentration values for sample i

n = number of samples in the test set for constituent calibration being evaluated (n = 50, see Note below regarding "all class" calibrations.)

The tolerance for repeatability is shown in Table 2.

Note: ~~"All class"~~"Multi-class" calibrations will be tested using full test sets for all included classes. ~~"All class"~~"Multi-class" calibrations must meet the repeatability requirements (SD) for the test sets of each individual class.

Reproducibility. The results for each of the three replicates obtained for samples in the test set will be averaged for each instrument and the Standard Deviation of the Differences (SDD) between instruments will be calculated using the following equation:

where $$SDD = \sqrt{\frac{\sum_{i=1}^{n}(d_i - \overline{d})^2}{n-1}}$$

$d_i = \overline{P}_{1i} - \overline{P}_{2i}$

$\overline{P}_{1i}$ = average of three replicates for sample *i* on instrument 1

$\overline{P}_{2i}$ = average of three replicates for sample *i* on instrument 2

$\overline{d}$ = average of d_i

n = number of samples in the test set for constituent calibration being evaluated (n = 50, see Note below regarding "all class" calibrations.)

The tolerance for reproducibility is shown in Table 2.

Note: ~~"All class"~~ "Multi-class" calibrations will be tested using full test sets for all included classes. ~~"All class"~~"Multi-class" calibrations must meet the reproducibility requirements (SDD) for the test sets of each individual class.

7. Proposed Change to the GMM Chapter of Publication 14 to Avoid Reducing a Previously Evaluated Approved/Pending Moisture Range Due to Lack of Data

Background: At the Sector's August 2005 meeting, Dr. Richard Pierce, GIPSA (the NTEP laboratory), mentioned that the NTEP laboratory is having problems increasing and decreasing "approved" or "pending" ranges of grain moisture meters depending on the data available in the most recent 3 year period. Most Sector members agreed that it didn't seem logical to reduce a range solely because data previously used to justify the range classification had to be dropped from the most recent 3 year period. Further discussion of the issue at that time was dropped because of time constraints.

The present system for determining the range of 2 % moisture intervals eligible for "approved" status uses only the most recent 3 years of NTEP data. An "approved" range cannot be extended by including manufacturer data. When the "approved" and "pending" moisture ranges were originally proposed, it was believed that after a meter had been in the Phase II on-going calibration program for 3 years the "pending" classification would go away because there would always be sufficient data in the 2 % intervals at the end of the calibration data range. Experience has shown that this is not the case. In fact, to maintain even a "pending" classification at the ends of the calibration data range, manufacturers often have to supply archived Phase II data to supplement the most recent 3 years used for the initial NTEP calibration report. With that data, moisture intervals listed as "not approved" on the initial calibration report can be upgraded to "pending" if the bias to air oven is within the approval tolerance for that moisture interval. Confidence intervals are not applied to approval tolerances for use in determining "pending" ranges when manufacturer data are used.

For calibration performance comparison purposes, it seems logical to continue using data from the most recent 3 year period. As new models are added to the On-going Calibration Program (Phase II), comparisons between meters become meaningful sooner than they would have if a longer period had been chosen.

At first glance, it also appears logical to recommend, provided a calibration has not changed, that moisture ranges previously evaluated as "pending" or "approved" not be reduced due to lack of data in subsequent 3-year periods. However, hard to find samples are only one issue. The NTEP laboratory has reported instances where there were quite a few samples in a moisture interval with the samples coming from only one or two growing locations. This resulted in meter to oven biases that varied from year to year depending on the source of the samples. In one meter and one moisture interval, the meter was out of NTEP tolerance using the last 3 years of data but biased within 0.08 of air oven result when using the last 5 years of data.

When it comes to determining how to set operating limits for an individual meter, one would think that using 5 years of available Phase II data would increase the number of samples across the entire moisture range and reduce the number of inadequately represented moisture intervals. However, for some grains no samples have been received in some moisture ranges within the last 3 years or even the last 5 years. There are cases where only one sample is available in a 2 % interval.

Eliminating or even reducing the problems encountered in determining "approved" or "pending" calibration ranges may require not only using more than the most recent 3 years or even 5 years of Phase II data but also limiting the moisture range over which an "approved" or "pending" rating can be granted. In practice, the present distinction between "approved" and "pending" classifications is lost to the user. The upper and lower moisture limits for a device are set using the "pending" range, so any "out-of-limits" warning printed or displayed appears only when the "pending" range is exceeded. Limiting the use of "pending" to a new device that has not been evaluated in Phase II could simplify the administration of Phase II and the annual re-issuing of CCs.

Discussion: The Sector discussed recommending major revisions to the GMM Chapter of Publication 14 that would be based on the following points:

1. Redefine "Pending" to read: A new calibration that has not been validated by on-going calibration data collected as part of the national calibration program.

2. The upper and lower moisture limits for a new device are to be set using the standard 6 % moisture ranges used in device evaluation.

3. Retain the present GMM comparison report based on the most recent 3 years of Phase II data. This report will be used for comparison purposes and for review by the Sector.

4. Limit the use of manufacturer data to the initial type evaluation and first complete season while enrolled in Phase II.

5. Prepare a second calibration report using all available Phase II data on file at GIPSA. This report is to be used to determine "approved" ranges. "Approved" ranges are to be used to set the upper and lower moisture limits for a GMM.

6. The maximum upper moisture interval and the minimum lower moisture interval that can be given "approved" status will be defined for each grain. These upper and lower limits are to be fixed values that do not change from year to year.

Consideration of the above points prompted a lively discussion. Although most Sector members were generally in favor of either redefining or eliminating the "Pending" classification, this approach implied that another method had to be found to determine operating ranges, because "Pending" moisture ranges have traditionally been used to set the upper and lower moisture limits (operating range) for each calibration. Manufacturers objected to using a single fixed range for all types of devices, noting that some technologies were more accurate than others at high moistures. They preferred an option that would allow them to extend competitively the operating range and objected to being restricted by limitations in the Phase II sample collection system. The suggestion that CCs carry the notation, "Evaluated over the moisture range of __ % to __ %, and certified for use over the range of __ % to __ %," was rejected on the grounds that an NTEP certificate was not intended to be a marketing tool. The Sector was also of the opinion that a 6 % operating range was too restrictive for a new device.

The question of how operating limits should be determined was temporarily set aside to consider fixed ranges for certification/verification of moisture calibrations. There was general agreement that the ranges had to be wide enough to encompass the moisture ranges used in the market, but there was concern that choosing ranges that were too wide would lead to the present problem of insufficient samples. Dr. Richard Pierce, GIPSA, distributed a page from the USDA/GIPSA Moisture Handbook that listed the moisture ranges supported by GIPSA for each grain type, suggesting that these moisture ranges might be considered for use as the fixed ranges for NTEP Phase II verification. Many Sector members believed that these ranges were too wide to be supported by 3 years (or even 5 years) of NTEP Phase II data. Durum Wheat, with a "GIPSA supported" range of 7 % to 20 %, had only four samples in the 6 % to 8 % moisture interval and only one sample in the 18 % to 20 % interval for the most recent 3 years of Phase II data. Similar sample shortages were noted for most of the other NTEP grains. A decision on the specific fixed ranges to be used for certification/verification of moisture calibrations was left for further study.

Several "what if" questions were asked regarding how fixed certification/verification ranges might work under certain circumstances. These questions and the Sector's response are outlined below.

Question: What "Certified/Verified" range should be listed for a new device?
Answer: New devices would be certified/verified over the basic 6 % moisture ranges listed for Phase I tests.

Question: What happens if not enough samples are available to certify the new device for the full range after one year in Phase II?
Answer: The certified/verified range remains at 6 % until enough samples have been collected in a 3-year period to certify the device for the full range.

Question: Will confidence intervals still be used?
Answer: Yes, a 95 % confidence interval will be added to the maximum tolerance for each 2 % moisture interval outside of the basic 6 % moisture range.

Question: What happens if a meter is outside of tolerance (even with the confidence interval) on any of the upper 2 % moisture intervals of the full range? Does the whole calibration get rejected?
Answer: Yes, the manufacturer must submit a new calibration with re-predicted moistures showing that tolerances are met for all 2 % intervals in the full range.

Question: What happens to an existing calibration if not enough samples are available in any of the upper 2 % intervals?
Answer: A previously verified calibration would not be forced to re-calibrate due to lack of samples.

With these questions answered, it was suggested that the manufacturer should specify the operating moisture range for each grain. This range would NOT be listed on the CC, but would be used to determine when warnings would be displayed and printed to indicate that the displayed/printed moisture content of a sample being measured was beyond the operating range of the device. [See NIST Handbook 44, Section 5.56.(a)., paragraphs S.1.1.(f) and S.1.3.(c).] Steve Patoray, NTEP Director, noted that there was a precedent for evaluation ranges that differed from operating ranges. There are devices that are tested by the NTEP lab over one range of conditions but used over a wider range of conditions. The Sector agreed that allowing individual manufacturers to specify the operating moisture ranges for their devices would make adoption of fixed evaluation/verification ranges for all CCs more acceptable.

Conclusion: The Sector decided that additional study was needed before a final recommendation could be made on this issue. This item will be carried over to the Sector's August 2007 meeting. The following points summarize the Sector's thinking at the close of the August 2006 meeting:

1. The "pending approval" classification will be eliminated. Operating ranges (upper and lower moisture limits) will be specified by the manufacturer. Operating ranges will NOT be listed on CCs.

2. The three most recent years of Phase II data will continue to be used to evaluate calibration performance.

3. Certificates will list a single "standard" moisture range for each grain calibration. These ranges will not vary from year to year. They will be the same for all instruments. (See exception for new instruments.) The "standard" ranges have to be wide enough to encompass the moisture ranges most commonly used in the market (to be determined) but narrow enough to assure sufficient Phase II data will be available (over a 3-year period) to:

    a. permit a new meter's calibrations to be "verified" over those ranges by the end of its third year in Phase II; and

    b. permit existing NTEP certified meters' calibrations to be "verified" over those ranges using the most recent 3 years of Phase II data when the new rules are first adopted.

4. Once a calibration has been "verified," a recalibration will not be forced due to lack of samples.

5. New instruments will be "evaluated" over the basic 6 % moisture ranges for corn, soybeans, and hard red winter wheat. Certificates for new instruments will continue to list the 6 % moisture ranges as the "evaluated" or "verified" ranges until sufficient Phase II data has been collected to allow the new instrument to achieve "verified" status for the full moisture range.

6. Outside the basic 6 % moisture range, tolerances used to require a change in calibrations will continue to include the application of a 95 % confidence interval to the maximum tolerance for each 2 % moisture interval.

8. Proposed Changes to Handbook 44 Section 5.56.(a), Paragraph S.4. and to the GMM Checklist of Publication 14 to Modify Operating Instruction Requirements

Background: Item (d) of paragraph S.4. in Handbook 44, Section 5.56.(a) Grain Moisture Meters requires that operating instructions for the device specify "the kinds or classes of grain or seed for which the device is designed to measure moisture content and test weight per bushel." Item (e), which requires declaring a device's "limitations of use" in the operating instructions, includes "kind or class of grain or seed" in the list of limitations to be declared and also requires that the "moisture measurement range" be shown, presumably, for each grain or seed. These requirements are redundant, considering paragraph S.1.3. Operating Range specifies that "A meter shall automatically and clearly indicate when the operating range of the meter has been exceeded," and with Item (c) of that paragraph further stating, "Moisture and test weight per bushel values may be displayed when the moisture range is exceeded if accompanied by a clear indication that the moisture range has been exceeded." The requirements of paragraph S.4. are also unnecessarily burdensome to manufacturers selling their GMMs in markets outside the United States. In those markets, the kinds and classes of grain or seed for which the GMM is to be used may not be the same as in the United States and may include non-NTEP grain or seed. In the United States, information pertaining to the kinds and classes of grain or seed for which the device is designed to measure moisture and TW are included in the NTEP CC along with the moisture measurement range of each NTEP grain or seed. Furthermore, the kinds and classes of grain are listed on the device's "menu" of included calibrations.

Discussion: The Sector considered the amendments and changes proposed in the agenda. Ms. Cassie Eigenmann, Dickey-john, was concerned that the above requirements applied to the "Instruction Manual." A review of the Grain Moisture Meter code in Handbook 44 indicated that the handbook mentions only "operating instructions" and makes no reference to an "Instruction Manual."

Conclusion: The Sector concluded that the "operating instructions" referred to in Handbook 44 could take many forms, including those displayed on the device's menu of installed calibrations. No change to Handbook 44 was deemed necessary.

9. Report on "Basis of Determination" in Official Grading Standards

Discussion: The principles governing application of official grain grading standards include definitions of the "basis of determination" to be used for each of the individual official tests. The "basis of determination" identifies

whether a measurement will be made on the whole grain sample, also referred to as the entire or original grain sample, or on a grain sample after dockage has been removed and/or after the sample has been cleaned.

The various "basis of determination" requirements are part of the U.S. grain grading standards and most have not been changed since USDA began implementing official standards in 1916. Current standards require that:

- official moisture measurements be made on the whole (uncleaned) grain sample;
- test weight measurements be made on the whole grain sample for some grain types while for other grain types test weight measurements be made on grain samples with dockage removed; and
- protein and oil determinations be made using clean grain samples.

Largely because conflicting "basis of determination" requirements are a barrier to adoption of multi-use instruments in official inspections, GIPSA is investigating the potential for establishing a common "basis of determination" for determining moisture, test weight, protein, and oil. Also, there is concern that moisture and test weight measurements on uncleaned grain samples may yield results that are not accurate for either the grain portion of the sample or the dockage in the sample.

Dr. Richard Pierce, GIPSA, presented a brief historical overview of inspection practices; a review of the levels of foreign material (FM), dockage, etc. measured in samples officially inspected in recent years; and preliminary data indicating how moisture and test weight measurements are affected as different levels of dockage are added to a clean sample.

Early test results on corn found no major effect on either moisture or TW as up to 12 % BCFM (broken corn and foreign material) was re-introduced in increments of approximately two percentage points to a clean sample from which the BCFM had been removed.

Soybeans were tested for the effects of added Splits (soybeans that are split/broken) and added FM.

Effect on Moisture and TW

- Moisture results showed negligible change with up to 10 % added Splits.
- Beyond 10 % Splits, moisture increased with added Splits.
- At 35 % Splits, percent moisture had increased by 0.8 %.
- Moisture results appear to be more variable with added Splits.
- TW decreases (2.0 lbs/bu) with 35 % added Splits.

Although moisture results seemed to be more variable with added FM, a recognizable pattern for moisture due to added FM was not found. Test weight decreased almost linearly with added FM to a loss of 5.5 lb/bu at 10 % added FM.

Wheat was tested for the effects of added SHBN (shrunken and broken kernels) and added DKG (dockage).

Effect on Moisture and TW

- Added SHBN below 3 % had no major effect on either moisture or TW.
- Levels of SHBN above 3 % were virtually nonexistent in the database.
- Percent moisture decreased with increasing DKG (–0.6 % with 2 % DKG).
- Moisture results seemed to become more variable.
- TW also decreased with increased DKG to a loss of 2 lb/bu at 2 % added DKG.

Dr. Pierce stressed that this study was in the early stages. Test procedures will be refined and additional data will be obtained on the effects of testing unclean grain samples. Although the early results seem to indicate that moisture results may not be greatly affected by moderate levels of dockage, the Sector agreed unanimously that clean samples must always be used for NTEP evaluations, calibration development, and state field-testing.

As additional data become available on the effects of testing unclean grain samples, and as GIPSA considers possible changes in "basis of determination" requirements, the Sector may want to discuss the possible implications for state-regulated commercial transactions.

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

Background: This item was included on the Sector's agenda to provide a summary of the activities of OIML TC 17/SC 1. Since June 22, 2001, an international work group (IWG) of TC 17/SC 1 has been meeting to review revision to OIML R 59. The most recent meeting of the TC 17/SC 1 work group (WG) was held on September 20 - 21, 2004, at the Laboratory National D'Essais (LNE) in Paris, France.

Discussion: Ms. Diane Lee, NIST/WMD, reported that the 4 CD, dated July 2006, along with U.S. comments on the 3 CD had been distributed to the United States National Work Group (USNWG). The USNWG is for the most part a subset of the NTEP Grain Analyzer Sector. Ms. Lee asked Sector members to review the changes included in the latest draft and forward comments to her by November 1, 2006. To assist in identifying and locating changes that have been made to the 3 CD for inclusion in the 4 CD, a copy of the collated comments to the 3 CD from all participating countries has been requested and will be forwarded to the USNWG upon receipt. [Editor's note: A copy of comments to the 3 CD from all participating countries was e-mailed to the USNWG on September 5, 2006.] The USNWG comments on the 4 CD of OIML R 59 will be collated and forwarded to the TC 17/SC 1 secretariat for inclusion in the next draft of the document.

11. Report on OIML TC 17/SC 8 Protein Draft Recommendation

Background: This item was included on the Sector's agenda to provide a summary of the activities of OIML TC 17/SC 8, the subcommittee responsible for developing a Recommendation for Grain Protein Measuring instruments. Since May 2004, an IWG of TC 17/SC 8 has been meeting to develop a new OIML Recommendation for instruments that measure grain protein. The most recent meeting of the TC 17/SC 8 WG was held in June 2005 in Berlin, Germany to discuss the latest round of comments on the 3 WD of the Recommendation.

Discussion: Diane Lee, NIST/WMD, reported that a 1 CD of "Protein Measuring Instruments for Cereal Grain and Oil Seeds" dated May 1, 2006, addressing comments received on the 3 WD had been distributed to the USNWG and related parties for comment. A meeting of the IWG was held in Ottawa, Canada, September 25 - 26, 2006, to discuss the comments to the 3 WD and the resulting 1 CD. The TC 17/SC 8 secretariat will make changes to the 1 CD according to discussion during the September 2006 meeting and develop a 2 CD that will be forwarded to the USNWG for comment when it is available.

12. Report on OIML TC 5/SC 2 Document D-SW, "General Requirements for Software Controlled Measuring Devices" and NTEP Software Sector Activities

Background: This item was included on the Sector's agenda to provide a summary of the activities of OIML TC 5/SC 2. In 2004, all OIML TCs and SCs that were revising an OIML Recommendation were contacted to ensure that software aspects are considered in revised Recommendations. All OIML Documents and Recommendations published since 1990 were reviewed for terms and requirements related to software. A pre-draft of the document "Software in Legal Metrology" was circulated in October 2004 by the Secretariats (Germany and France). When complete, this document will serve as guidance for OIML technical committees addressing software requirements in Recommendations for software-controlled instruments. NIST submitted U.S. comments on an early draft in February 2005. The 1 WD of this document, titled "General Requirements for Software Controlled Measuring Instruments," was received in February 2006, after which comments from U.S. interested parties were solicited. U.S. comments on this draft were sent to the secretariat May 30, 2006. The 1 WD and the U.S. comments can be viewed on the NIST/WMD website at http://ts.nist.gov/ts/htdocs/230/235/TC5-SC2.htm.

Discussion: After the report on OIML TC 5/SC 2, Steve Patoray, NTEP Director, called the Sector's attention to the recently formed NTETC Software Sector. This new Sector held its first scheduled meeting April 5, 6, and 7, 2006, in Annapolis, Maryland, where several subcommittee WGs were formed to focus on various aspects relating to the

use of software in today's weighing and measuring instruments. Mr. Patoray mentioned that the Software Sector's work initially would not affect the Grain Analyzer Sector because grain analyzers, at present, are "built-for-purpose" devices. Looking to the future, however, a system in which a local instrument obtains optical data on the sample to be measured, transmits it to an off-site computer that calculates the result and transmits the result back to the local instrument for display and printout would most likely have to comply with standards developed by the Software Sector. Interested parties wishing to participate in this Sector should direct their requests to Steve Patoray who will see that they are forwarded to the appropriate individual for processing.

13. Time and Place for Next Meeting

The next meeting is tentatively planned for the week of August 20, 2007, in the Kansas City, Missouri, area. Meetings will be held in one of the meeting rooms at the National Weather Service Training Center if available. The meeting room will be reserved for Wednesday and Thursday, August 22 and 23. Sector members are asked to hold both these days open pending determination of agenda items, exact meeting times, and meeting duration. Final meeting details will be announced by late April 2007.

If you would like to submit an agenda item for the 2007 meeting, please contact Steve Patoray, NTEP Director, at spatoray@mgmtsol.com; G. Diane Lee, NIST Technical Advisor, at diane.lee@nist.gov; or Jack Barber, Technical Advisor, at jbarber@motion.net by April 2, 2007.

[Note: The following items were not on the original agenda, but were added at the meeting on an "as time permits" basis.]

14. Encouraging Participation by State Weights and Measures Personnel

Discussion: Noting that only one state W&M representative was able to attend the current Sector meeting, several Sector members wondered what could be done to encourage additional states to send representatives to Sector meetings. At present, five states are represented on the Grain Analyzer Sector: Arkansas, Nebraska, New York, North Carolina, and Missouri. Of those five states, only three participate on a regular basis. For the current meeting, family illness and travel budget restrictions cut the participation to one. Budget cuts and a significant increase in travel costs (gasoline, airfares, and lodging) seem to be the major underlying causes for the drop in participation. With limited personnel and limited budgets, state W&M administrators have had to make hard choices on how best to utilize the people and dollars available.

It is current NCWM policy to provide funding for travel to a Sector meeting to one participant from each state NTEP laboratory active in evaluating the device type(s) which will be discussed at the particular Sector meeting. Unfortunately, GIPSA is the sole participating NTEP laboratory for grain analyzers. GIPSA is a federal agency not a state agency; therefore, no state W&M representative receives funding from NCWM, Inc., for travel to Grain Analyzer Sector meetings.

According to the 2002 Census of Agriculture, the states of Illinois, Indiana, Iowa, Minnesota, and Nebraska grew 67 % of the corn and 60 % of the soybeans grown in the entire United States. Only one of these states is listed as having a representative on the Grain Analyzer Sector, and it has been four years since that representative has attended a Sector meeting.

The Sector took no action on this issue.

15. Questions Regarding NIR Calibration for Enhanced Nutrient Corn

Discussion: Dr. Stuart Kaplan, BASF Plant Science, explained that BASF contracts with select area grain elevators to receive and store BASF enhanced nutrient corn grown by farmers who are also under contract with BASF. To verify that incoming BASF corn meets contract specifications, elevators test the corn using Foss Infratec 1241 NIR analyzers that BASF has placed in the elevators for this purpose. Because the present NTEP corn calibration for the Foss 1241 does not accurately measure the constituents of the BASF germplasm, BASF developed a calibration

specifically for their enhanced nutrient corn. Dr. Kaplan was concerned that their NIR instruments might be "tagged" by state W&M field inspectors. He asked the Sector what might be done to avoid problems of this sort.

Sector members offered a number of suggestions. Steve Patoray, NTEP Director, suggested that Dr. Kaplan contact the director of each related state weights and measures division to see how this would be handled in that jurisdiction. A state W&M member explained that his state had an "implied use" regulation. If an inspector encountered a measuring instrument in a location where buying and selling took place, it was implied that the instrument was in "commercial use" and would be subject to test. Another member suggested that notice be placed on the instrument to indicate that it was the property of BASF and was to be used exclusively for testing corn grown under contract with BASF. (Note: Although an instrument may be used for contract sales, it is still commercial and subject to weights and measures regulation.)

Noting that paragraph S.1.2. of Section 5.57. of Handbook 44 states, "If more than one calibration is included for a given grain type, the calibrations must be clearly distinguished from one another," Mr. Jack Barber, the co-technical advisor, suggested that the BASF calibration be installed on the NIR instrument with a name that clearly differentiated their proprietary variety from common yellow dent corn. If the NTEP corn calibration is also installed on the instrument, normal regulatory field inspection of the instrument could be performed using the NTEP calibration. Nothing in Handbook 44 prohibits using proprietary calibrations for specialty crops grown under contract. Field inspection of the instrument with standard corn samples could offer BASF assurance that the instrument was functioning properly.

Change Summary

Recommended Amendments to the 2006 Edition of NIST Handbook 44			
Section Number	**Amendment/Change**	**Page**	**Source**
5.56.(a) Grain Moisture Meters	Modify paragraph S.1.2. and Table S.1.2. to include minimum acceptable abbreviations for multi-class grain moisture calibrations.	5-28	08/06 Grain Analyzer Sector – Item 5
5.57. Near Infrared Grain Analyzers	Modify paragraph S.1.2. and Table S.1.2. to add criteria applicable to "multi-class" calibrations.	5-42	08/06 Grain Analyzer Sector – Item 6(a)

Recommended Amendments/Changes to the Grain Moisture Meters Chapter to the 2006 Edition of NCWM Publication 14			
Section Number	**Amendment/Change**	**Page**	**Source**
VII. Additional Type Evaluation Test Procedures and Tolerances for Grain Moisture Meters Incorporating an Automatic Test Weight per Bushel Measuring Feature	Add paragraph C. Tolerances For Test Weight per Bushel Calibration Performance [Note: Paragraph C should immediately follow the table of tolerances for reproducibility on page GMM-16.]	GMM-16	08/06 Grain Analyzer Sector – Item 4

Recommended Amendments/Changes to the Near Infrared Grain Analyzers Chapter to the 2006 Edition of NCWM Publication 14			
Section Number	**Amendment/Change**	**Page**	**Source**
III. Accuracy, Precision, and Reproducibility Requirements	Amend to add criteria applicable to "multi-class" calibrations.	NIR-3 thru NIR-6	08/06 Grain Analyzer Sector – Item 6(b)