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Comments on All Items in Block 4 Regarding Transfer Standards

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Representatives of the NIST Office of Weights and Measures have stated that they consider these proposed changes to be editorial, that is, the changes do not make any substantive changes to the meaning or application of the existing requirements of Handbook 44. Apparently, all of the "reference standards" mentioned in the codes would now be considered to be field standards and would have to meet the one-third requirement stated in the Fundamental Considerations of Handbook 44. Essentially all of the "reference standards" mentioned in the H44 codes as master meters (Milk Tank Code and Hydrogen Gas-Measuring Devices Code), unit trains (Scales Code), material test (Scales Code and Belt-Conveyor Scale Code), railroad reference weight cars (Scales Code), the proposed Block 5 "field reference standard meter" and all of the other reference standards covered by the codes for which OWM is proposing changes, would now be considered field standards without having any design or performance requirements for these "field standards." However, many of these transfer standards and reference weight cars do not meet the one-third requirement. Hence, one must conclude that their use would be prohibited under the proposed OWM changes. Consequently, the impact of the proposed OWM changes is great. A great deal of study and discussion are needed to assess the ramifications of these proposed changes. The proposed changes are not editorial and should remain developmental until the following issues have been resolved.

1. Comments Applicable to All Items Regarding Transfer Standards

The Fundamental Considerations of Handbook 44 states the following:

> **3.2. Tolerances for Standards.** – Except for work of relatively high precision, it is recommended that the accuracy of standards used in testing commercial weighing and measuring equipment be established and maintained so that the use of corrections is not necessary. When the standard is used without correction, its combined error and uncertainty must be less than one-third of the applicable device tolerance.

This is often referred to as the one-third requirement, which means that any standard used without correction (or when the correction is used) and the uncertainty associated with the value of the standard, may be used as a (field) standard to test commercial weighing and measuring devices. However, it is not enough for a standard to be valid in a laboratory setting; the standard must be valid and stable when used in the field.

When testing commercial liquid measuring devices, any proposed standard must be accurate, valid (traceable) and stable over the range of operating parameters and environmental conditions over which the commercial device is used and tested. For example, to test a liquid meter, the standard must be accurate over the range of field conditions that include:

- The range of flow rates at which the meter operates;
- The range of air temperatures
- The range of product temperatures;

- The range of temperature differences that may exist between the product, the standard and the air;
- The range of pressures at which the pumping systems operate;
- The different products measured by the meters; and
- Tests of multiple "standards" of the same type when used in different test system configurations (and "standards" of different sizes, if available) to verify that the results agree and are consistent.

Weights and measures officials must be confident that their test results are valid and that the standards that they use provide correct test results. The proposals to recognize additional transfer standards and field standards, and the proposals to change the references from transfer standards to field standards do not provide any explanation or justification for how these transfer standards or field standards satisfy the one-third requirement over the range of operating parameters and environmental conditions in which meters are used and tested.

Another set of concerns exists regarding how to determine the performance characteristics of transfer standards at an acceptable level of confidence? The following list illustrates some of these concerns.

1. Is it the intent of OWM to require all "transfer standards" mentioned in the codes to be considered "field standards" and have to meet the one-third requirement for performance?
2. Does OWM intend to develop a 105 handbook for each of the transfer standards currently identified in Handbook 44?
3. It is assumed that any standard that is covered by a 105 handbook also meets and can prove that it satisfies the one-third performance requirement stated in the Fundamental Considerations of Handbook 44. There are major differences between the assessment of an artifact as a field standard and assessing the performance of a weighing or measuring device (or test system) as a field standard.
4. The definition of field standard in Handbook 130 specifies that a field standard is a physical standard. I interpret this to mean that the standard is an artifact and not a weighing or measuring system. How do weights and measures officials interpret the definition?
5. The definition of field standard in Handbook 130 specifies that a field standard can be another suitable and designated standard that does not rely upon a NIST 105 handbook. I assume that this allows for the recognition of standards that comply with documentary standards from ASTM, ISO, OIML, etc. When weighing or measuring systems are proposed as field standards under these other documentary standards, is it safe to presume that the performance of the proposed standard has been evaluated to the one-third requirement of Handbook 44?
6. Will the proposed OWM changes effectively eliminate the use of those transfer standards currently recognized in Handbook 44 codes? I assume that the answer is yes, unless the transfer standard can prove its performance within the one-third requirement of Handbook 44.
7. How long does a field standard have to a valid reference; an hour, one day, one week or one year? Over which range of field parameters must the proposed field standard prove that it performs within the one-third requirement?

8. Which tests must be run, which data are needed and which analyses must be performed to demonstrate the acceptable performance of proposed field standards with respect to accuracy, repeatability and the effect of influence factors?
9. Commercial measuring devices must be tested as used in the field. If the commercial measuring devices are not tested as installed and used, then how do you know that the commercial measuring devices are accurate as used?

2. Examples of Transfer Standards Cited in Handbook 44 Codes

One requirement for a field standard as stated in paragraph 3.2 of the Fundamental Considerations is that "…its combined error and uncertainty must be less than one-third of the applicable device tolerance." How the uncertainty is determined for the transfer standard will vary with the type of transfer standard, reference scale, reference material or reference car weight that is used. In general, many measurements must be made to establish the standard deviation of a measurement process on which the uncertainty statement is based. If only a few measurements are made, then the statistical t-table values must be used to estimate the uncertainty. The t-values are very large if only a few measurement values are available, which would make it difficult to establish the uncertainty associated with the transfer standard to less than 1/3 of the smallest tolerance to be applied to the device under test.

If a meter will be used repeatedly over time to test other commercial meters, then a history of meter repeatability can be established over the extended time that the meter is used. This history can be used to establish the standard deviation and estimate the uncertainty associated with meter repeatability over time and environmental conditions. However, if a meter or a scale is going to be used only one time (or sporadically) as a reference, then the primary options are to conduct many tests on the meter or scale before it is used as a reference or conduct a limited number of tests and use t-values to estimate the uncertainty associated with repeatability. Either of these two options creates concerns regarding the effective implementation of these test methods.

The following examples of transfer standards are provided to illustrate range of measurement issues associated with transfer standards. The questions above must be answered for each of the transfer standards identified below. Which of the following "transfer standards" meet the requirements as field standards? If the "transfer standards" do not qualify as field standards according to the OWM proposals, then how can the commercial measuring devices be tested?

Scales Code	**Comments**
N.1.3.5.1. Dynamic tests using livestock carcasses: [for "hot scales"] care must be taken to get a static weighment as quickly as possible before or following the dynamic weighment to avoid loss due to shrink.	The carcasses are needed to test the scale as used, but are not stable over even a short period of time.
N.1.8. Material Tests. – A material test shall be conducted on all customer-operated bulk weighing systems for recycled materials using bulk material for which the device is used.	The material is fed through the weighing system to test the dynamic weighing performance of the system.
N.4. Coupled-in-Motion Railroad Weighing Systems. **N.4.1. Weighing Systems Used to Weigh Trains**	The railroad cars used as reference weights will probably be weighed on the nearest static weighing railroad track scale. The test loads used to test the reference scale,

of Less Than Ten Cars. – These weighing systems shall be tested using a consecutive-car test train consisting of the number of cars weighed in the normal operation run over the weighing system a minimum of five times in each mode of operation following the final calibration.	i.e., the static-weighing railroad track scale, will probably be less than 100 000 lb. Most of the loaded railroad cars used as reference weight cars will probably weigh around 250 000 lb. Consequently, the scale accuracy at 250 000 lb is not known. The repeatability of the scale is not known. The time involved to weigh the reference weight cars statically is considerable, so it is unlikely that any of the cars will be weighed twice. As a result, the uncertainly associated with the weighing of the reference weight cars is not known, so the reference weight cars would not qualify as field standards.
N.4.3.1.3. Distributed-Car Test Trains. (a) The length of the train shall be typical of trains that are normally weighed. (b) The reference weight cars shall be split into three groups, each group consisting of ten cars or 10 % of the train length, whichever is less. (c) The test groups shall be placed near the front, around the middle, and near the end of the train.	
N.4.3.1.4. Consecutive-Car Test Trains. (a) A consecutive-car test train shall consist of at least ten cars.	
N.5. Uncoupled-in-Motion Railroad Weighing System. – An uncoupled-in-motion scale shall be tested statically before being tested in motion by passing railroad reference weight cars over the scale. When an uncoupled-in-motion railroad weighing system is tested, the car speed and the direction of travel shall be the same as when the scale is in normal use. The minimum in-motion test shall be three reference weight cars passed over the scale three times. The cars shall be selected to cover the range of weights that are normally weighed on the system and to reflect the types of cars normally weighed.	
Belt-Conveyor Scale Systems	
N.1.1. Official Test. – An official test of a belt-conveyor scale system shall include tests specified in N.3.1. Zero Load Tests, N.3.2. Material Tests, and, if applicable, N.3.3. Simulated Load Tests.	
N.3.2. Material Tests. – Material tests should be conducted using actual belt loading conditions. These belt loading conditions shall include, but are not limited to conducting materials tests using different belt loading points, all types and sizes of products weighed on the scale, at least one other belt speed, and in both directions of weighing. To assure that the test load is accurately weighed and determined, the following precautions shall be observed: (a) The containers, whether railroad cars,	How does one verify the conditions specified for the weighing and transport of the materials were followed? How does one verify that the railroad cars do not leak or that wind has not caused any loss of material during transport? It is unlikely, especially for a railroad track scale, that the scale was tested to the weight of the loaded railroad cars. If a truck scale is used as the reference

trucks, or boxes, must not leak, and shall not be overloaded to the point that material will be lost. (b) The actual empty or tare weight of the containers shall be determined at the time of the test. Stenciled tare weight of railway cars or trucks shall not be used. Gross and tare weights shall be determined on the same scale. (c) When a pre-weighed test load is passed over the scale, the belt-loading hopper shall be examined before and after the test to assure that the hopper is empty and that only the material of the test load has passed over the scale. (d) Where practicable, a reference scale should be tested within 24 hours preceding the determination of the weight of the test load used for a belt-conveyor scale material test. A reference scale which is not "as found" within maintenance tolerance should have its accuracy re-verified after the belt-conveyor test with a suitable known weight load if the "as found" error of the belt-conveyor scale material test exceeds maintenance tolerance values.* (e) If any suitable known weight load other than a certified test weight load is used for re-verification of the reference scale accuracy, its weight shall be determined on the reference scale after the reference scale certification and before commencing the belt scale material test.* (f) The test shall not be conducted if the weight of the test load has been affected by environmental conditions. ***Note:** Even if the reference scale is within maintenance tolerance it may require adjusting to be able to meet paragraph N.3.2.1. Accuracy of Material.	standard, it is also possible that the scale was not tested to the weight of the loaded trucks. Also, how does one correct for section errors? Must one take into account the load distribution on the axles and the location of the axles on the scale? Does the material qualify as a field standard, i.e., is the material a traceable standard and its accuracy known within 1/3 of the tolerance applied to the belt-conveyor scale?
N.3.2.1. Accuracy of Material. – The quantity of material used to conduct a material test shall be weighed on a reference scale to an accuracy within 0.1 %.	The uncertainty associated with the test of the reference scale is not known. If the reference scale is a vehicle scale or a railroad track scale, it is possible that the scale was not tested to the weight of the trucks or loaded railroad cars used to transport the materials.
T.1. Tolerance Values.[1] – Maintenance and	The tolerance of ±0.25 % is a relative

acceptance tolerances on materials tests, relative to the weight of the material, shall be ±0.25 % of the test load. [1]The variables and uncertainties included in the relative tolerance represent only part of the variables that affect the accuracy of the material weighed on belt-conveyor scales. If this tolerance was based on an error analysis beginning with mass standards through all of the test processes and following the principle expressed in Section 3.2. of the Fundamental Considerations in Appendix A, the tolerance would be 0.5 %.	tolerance, that is, the tolerance is applied relative to the scale that was used to weigh the material for the materials tests.
Automatic Weighing Systems	
N.1.2. Accuracy of Test Pucks or Packages. – The error in any test puck or package shall not exceed one-fourth (1⁄4) of the acceptance tolerance. If packages are used to conduct field tests on automatic weighing systems, the package weights shall be determined on a reference scale or balance with an inaccuracy that does not exceed one-fifth (1/5) of the smallest tolerance that can be applied to the device under test.	Is an uncertainty analysis needed to ensure that the combined error and the uncertainty of the test pucks and packages are less than 1/5 of the smallest tolerance that can be applied to the device under test?
Weigh-In-Motion Systems – Tentative Code	
N.1.1.1. Weighing of Test Vehicles. – All test vehicles shall be weighed on a reference scale before being used to conduct the dynamic tests.	The reference scale is presumed to be a static-weighing vehicle scale. The uncertainty associated with the test of the reference scale is not known. It is possible that the reference scale was not tested to the loaded weight of the trucks or a strain load test may have been conducted. Should substitution tests be required for the reference scale up to the loaded weight of the "reference" vehicles? How does one correct for section errors in the reference vehicle scale?
N.1.1.2. Determining Reference Weights for Axle, Axle Groups, and Gross Vehicle Weight. – The reference weights shall be the average weight value of a minimum of three static weighments of all single axles, axle groups, and gross vehicle weight.	What is the uncertainty associated with the average axle weights? Does the standard deviation have to be calculated for each individual axle group? The t-table values may have to be used to estimate the uncertainties.
N.1.2. Test Loads. **N.1.2.1. Static Test Loads.** – All static test loads shall use certified test weights. **N.1.2.2. Dynamic Test Loads.** – Test vehicles used for dynamic testing shall be loaded to 85 % to	

95 % of their legal maximum Gross Vehicle Weight. The "load" shall be non-shifting and shall be positioned to present as close as possible, an equal side-to-side load.	
N.1.3. Reference Scale. – Each reference vehicle shall be weighed statically on a multiple platform vehicle scale comprised of three individual weighing/load-receiving elements, each an independent scale. The three individual weighing/load receiving elements shall be of such dimension and spacing to facilitate: (a) the single-draft weighing of all reference test vehicles; (b) the simultaneous weighing of each single axle and axle group of the reference test vehicles on different individual elements of the scale; and (c) gross vehicle weight determined by summing the values of the different reference axle and reference axle groups of a test vehicle. The scale shall be tested immediately prior to using it to establish reference test loads and in no case more than 24 hours prior. To qualify for use as a suitable reference scale, it must meet NIST Handbook 44, Class III L maintenance tolerances.	The tolerances for WIM scales are large compared to static-weighing scales.
N.1.3.1. Location of a Reference Scale. – The location of the reference scale must be considered since vehicle weights will change due to fuel consumption.	How are the errors associated with variable fuel consumption considered in assessing if the reference vehicles qualify as field standards?
Liquid-Measuring Devices	There are no transfer standards cited in the LMD Code.
Vehicle-Tank Meters	There are no transfer standards cited in the VTM Code.
Hydrocarbon Gas Vapor-Measuring Devices	There are no transfer standards cited in the HGV Code.
Cryogenic Liquid-Measuring Devices	
N.3.2. Transfer Standard Test. – When comparing a meter with a calibrated transfer standard, the test draft shall be equal to at least the amount delivered by the device in two minutes at its maximum discharge rate, and shall in no case be less than 180 L (50 gal) or equivalent thereof.	This code specifically recognizes the use of transfer standards that do not meet the requirements for field standards. The tolerance is increased when these transfer standards are used. There is no guidance given for how to determine the standard

When testing uncompensated volumetric meters in a continuous recycle mode, appropriate corrections shall be applied if product conditions are abnormally affected by this test mode. **T.3. On Tests Using Transfer Standards. –** To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard when compared to a basic reference standard.	deviations for the transfer standards over the range of operating parameters for the commercial meter. If the reference of transfer standard is changed to field standard, then this change will prohibit the use of these transfer standards, since the transfer standards are presumed not to meet the 1/3 requirement of the Fundamental Considerations. The OWM proposes to delete paragraph T.3. that provides the additional tolerance when transfer standards are used.
Carbon Dioxide Liquid-Measuring Devices	
N.3.2. Transfer Standard Test. – When comparing a meter with a calibrated transfer standard, the test draft shall be equal to at least the amount delivered by the device in two minutes at its maximum discharge rate. T.3. **On Tests Using Transfer Standards.** – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard when compared to a basic reference standard.	This code specifically recognizes the use of transfer standards that do not meet the requirements for field standards. The tolerance is increased when these transfer standards are used. There is no guidance given for how to determine the standard deviations for the transfer standards over the range of operating parameters for the commercial meter. If the reference of transfer standard is changed to field standard, then this change will prohibit the use of these transfer standards, since the transfer standards are presumed not to meet the 1/3 requirement of the Fundamental Considerations. The OWM proposes to delete paragraph T.3. that provides the additional tolerance when transfer standards are used.
Hydrogen Gas-Measuring Devices – Tentative Code	
N.4.1. Master Meter (Transfer) Standard Test. – When comparing a measuring system with a calibrated transfer standard, the minimum test shall be one test draft at the declared minimum measured quantity and one test draft at approximately ten times the minimum measured quantity or 1 kg, whichever is greater. More tests may be performed over the range of normal quantities dispensed. **N.4.1.1. Verification of Master Metering Systems.** – A master metering system used to verify a hydrogen gas-measuring device shall be verified before and after the verification process. A	This code specifically recognizes the use of master meters (transfer standards) that do not meet the requirements for field standards. The tolerance is increased when these transfer standards are used. There is no guidance given for how to determine the standard deviations for the transfer standards over the range of operating parameters for the commercial meter. If the reference of transfer standard is changed to field standard, then this change will prohibit the use of these transfer standards, since the transfer standards are presumed not to meet the 1/3 requirement of the

master metering system used to calibrate a hydrogen gas-measuring device shall be verified before starting the calibration and after the calibration process. **T.4. Tolerance Application on Test Using Transfer Standard Test Method.** – To the basic tolerance values that would otherwise be applied, there shall be added an amount equal to two times the standard deviation of the applicable transfer standard when compared to a basic reference standard.	Fundamental Considerations. The OWM proposes to delete paragraph T.3. that provides the additional tolerance when transfer standards are used. Obviously, the master meters are not considered to have long-term stability or validity over a range of environmental conditions, since N.4.1.1. specifies that the master meters must be verified before and after the calibration process.
Farm Milk Tanks	
N.5. Test Methods. – Acceptance tests of milk tanks may be of either the prover method or the master meter method provided that the master metering system is capable of operating within 25 % of the applicable tolerance found in T.3. Basic Tolerance Values. Subsequent tests may be of either the prover method or the master meter method provided that the master metering system is capable of operating within 25 % of the applicable tolerance found in T.4. Basic Tolerance Values, Master Meter Method. **N.5.1. Verification of Master Metering Systems. –** A master metering system used to gauge a milk tank shall be verified before and after the gauging process. A master metering system used to calibrate a milk tank shall be verified before starting the calibration and re-verified at least every quarter of the tank capacity, or every 2000 L (500 gal), whichever is greater. The above process of re-verifying the master metering system may be waived if the system is verified using a NIST traceable prover with a minimum of two tests immediately before and one test immediately after the gauging process and that each test result is within 25 % of T.3. Basic Tolerance Values. **T.4. Basic Tolerance Values, Master Meter Method. –** The basic maintenance and acceptance tolerance for tanks tested by the master meter method shall be 0.4 % of the volume of test liquid in the tank at each test draft.	OWM has not proposed any changes to this code. However, if the other codes are changed, then this code should be changed as well. This code specifically recognizes the use of master meters (transfer standards) that do not meet the requirements for field standards. The tolerance is increased when these transfer standards are used. There is no guidance given for how to determine the standard deviations for the transfer standards over the range of operating parameters for the commercial meter. If the reference of transfer standard is changed to field standard, then will this change prohibit the use of these transfer standards, since the transfer standards are presumed not to meet the 1/3 requirement of the Fundamental Considerations. Obviously, the master meters are not considered to have long-term stability or validity over a range of environmental conditions, since N.5.1. specifies that the master meters must be verified before and after the gauging process. If used for calibrating a milk tank, then the master meter must be verified during the process of calibrating the milk tank.
Odometers and Taximeters Codes	
(b) Fifth-Wheel Test. – A fifth-wheel test	OWM has not proposed changes to these

consists of driving the vehicle over any reasonable road course and determining the distance actually traveled through the use of a mechanism known as a "fifth wheel" that is attached to the vehicle and that independently measures and indicates the distance. **fifth wheel. –** A commercially-available distance-measuring device which, after calibration, is recommended for use as a field transfer standard for testing the accuracy of taximeters and odometers on rented vehicles. [5.53, 5.54]	codes, but transfer standards are part of these codes. These codes allow the use of a fifth wheel to determine the accuracy for distance measurement. However, in the definition, the fifth wheel is identified as a transfer standard. NBS Handbook 137 explains why the fifth wheel is a transfer standard. **NBS Handbook 137, "Examination of Distance Measuring Devices," Issued December 1980** **3.3. FIFTH-WHEEL TEST EQUIPMENT.** - The fifth wheel is a commercially-available distance-measuring device recommended for use by weights and measures officials as a field transfer standard for testing the accuracy of taximeters and odometers on rented vehicles. The instrument is an accurate distance-measuring device (its error is less than 10% of the smallest applicable tolerance (1%)). However, it requires calibration at periodic intervals to maintain its accuracy. A calibrated fifth wheel may also be used to layout a taximeter or odometer measured course. The fifth wheel is recognized to be very accurate for short periods of time and probably over a limited range of environmental conditions. No additional tolerance when using the fifth wheel is included in the code, because of its high accuracy for the short time it is expected to be used between calibrations. The reasons why a fifth wheel requires frequent calibration are not given. The need for frequent calibration raises the issue of how long a standard must be stable to be considered appropriate as a field standard. This issue must be addressed along with the range of parameters over which the field standard must be accurate and stable.
Grain Moisture Meters (a)	

N.1.1. Air Oven Reference Method Transfer Standards. – Official grain samples shall be used as the official transfer standards with moisture content and test weight per bushel values assigned by the reference methods. The reference methods for moisture shall be the oven drying methods as specified by the USDA GIPSA. The test weight per bushel value assigned to a test weight transfer standard shall be the average of 10 test weight per bushel determinations using the quart kettle test weight per bushel apparatus as specified by the USDA GIPSA. Tolerances shall be applied to the average of at least three measurements on each official grain sample. Official grain samples shall be clean and naturally moist, but not tempered (i.e., water not added).	How field standards are defined and the characteristics of field standards are critical to assessing the use of grain samples as field standards. The grain samples used to test grain moisture meters (GMMs) are referred to as "official grain samples" and are recognized as transfer standards. Grains are biological products and the electrical characteristics of grains vary from one growing year to another, vary with soil characteristics, and vary geographically based upon the characteristics of the growing seasons. Grain samples must be screened to find samples that remain stable at the different moisture levels for the times that the samples will be used to test GMMs. The stability of grain samples often depends upon the moisture levels of the samples, the biological composition of the grains and how the samples are stored. The answers to the questions at the beginning of these comments are needed to understand how field standards are defined and characterized. How long must a field standard be valid?
N.1.3. Meter to Like-Type Meter Method Transfer Standards. – Properly standardized reference meters using National Type Evaluation Program approved calibrations shall be used as transfer standards. A reference meter shall be of the same type as the meter under test. Tests shall be conducted side-by-side using, as a comparison medium, grain samples that are clean and naturally moist, but not tempered (i.e., water not added).	Meter-to-meter calibration is recognized as transfer standards. However, meter-to-meter calibration does not encompass all of the variables that are tested when using grain samples. OWM proposes changing the reference to transfer meters to field standards. However, meter-to-meter testing does not include the assessment of important systematic errors that may exist. The definition of "field standard" must clarify this type of situation.
T.2.2. Meter to Like-Type Meter Method. – Maintenance and acceptance tolerances shall be as shown in Table T.2.2. Acceptance and Maintenance Tolerances Meter to Like-Type Meter Method. The tolerances shall apply to all types of grain and seed.	A separate tolerance table applies to meter-to-meter testing. If GMMs are now considered to be field standards, shouldn't the systematic errors associated with meter-to-meter testing be evaluated as part of the uncertainty associated with the field standards and meet the 1/3 requirement?
Electronic Livestock, Meat, and Poultry Evaluation Systems and/or Devices	
N.2. Testing Standards. – ASTM Standard F2343 requires device or system users to maintain accurate reference standards that meet the	I am unable to comment on the potential impact of the proposed changes.

tolerance expressed in NIST Handbook44 Fundamental Considerations, paragraph 3.2. Tolerances for Standards (i.e., one-third of the smallest tolerance applied). **N.3. Verification. –** Device or system users are required to verify and document the accuracy of a device or system on each production day as specified by ASTM Standard F2341 Standard Practice of User Requirements for Livestock, Meat, and Poultry Evaluation Devices or Systems.	
B4: OTH-2 **Appendix A: Fundamental Considerations, 3.2. Tolerances for Standards, 3.3. Accuracy of Standards**	As proposed by OWM, it is logical that the references to standards in these sections refer to field standards. However, if all transfer and reference standards currently cited in Handbook 44 are now considered field standards, will OWM issue 105-series handbooks for each of the "field standards?"
B4: OTH-3 **Appendix D – Definitions: fifth-wheel, official grain samples, transfer standard and Standard, Field** **Standard, Field. – A physical standard that meets specifications and tolerances in NIST Handbook 105- series standards (or other suitable and designated standards) and is traceable to the reference or working standards through comparisons, using acceptable laboratory procedures, and used in conjunction with commercial weighing and measuring equipment.**	The proposed OWM change appears to commit OWM to develop a Handbook 105-series document to address each type of field standard referenced in Handbook 44. The issues and questions listed at the beginning of these comments must be addressed or answered for weights and measures officials and industry representatives to properly understand and assess the proposed changes. This block 4 items should remain developmental until these issues have been resolved.