2013 ISSUE 1

NCWM - NEWS

National Conference on Weights and Measures

INSIDE THIS ISSUE

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Chairman's Column

Stephen Benjamin — North Carolina Department of Agriculture and Consumer Services

Hello Members! We had a successful Interim Meeting in Charleston, SC at the end of January. We had 146 attendees, which is up a bit from previous years. As we were located in downtown Charleston, there was plenty to do once our hearings and work sessions ended. The weather was sunny and mild right up until we had to leave. I've heard several stories of delays and long trips home due to the storms in the central and eastern parts of the country, I hope everyone got home safely.

Some of the highlights for the Laws and Regulations (L&R) Committee were "voting item" status on several items including the method of sale for electricity for vehicles, moisture allowance on pasta products, animal bedding and the updating of definitions in the Uniform Weights and Measures Law. The Task Group on Printer Ink and Toner Cartridges appears to have completed its charge; determining that gravimetric testing of these devices would not be possible, but the method of sale and labeling was moved forward as a voting item.

The L&R Committee had what may have been a record open hearing session, lasting almost all day, but there was a lot of good information that came forward. One item that had a lot of discussion was the retail sale of natural gas as vehicle fuel and the proposal to establish a diesel liter equivalent and diesel gallon equivalent for this alternative fuel. While it seems everyone is supportive of natural gas as an alternative fuel, how it should be sold will be well debated in the near future. To that end, I am going to establish a steering committee on this topic with the charge of collecting the facts and data available. It will report this information to the NCWM with the purpose of educating us all, similar to what the ATC Steering Committee did several years ago. The Natural Gas Vehicle Fuel Steering Committee will include 1 member from both the L&R and Specifications and Tolerances (S&T) Committees and at least 3 other members.

The S&T Committee has proposed a number of voting items including those on belt conveyor scale systems, water meters, vehicle tank meters and railway scales. The Taxi Meter Work Group is making progress and those items are still in development. The RMFD Price Posting and Computing Capability Task Group made some recommendations to the committee and there is a voting item on the agenda, though there is still more to consider on that issue.

The Professional Development Committee (PDC) reported their progress on the Professional Certification Program. I congratulate them on their continued efforts in this area, which would not be possible without the help of the Subject Matter Experts (SMEs) in developing and reviewing the questions for the tests. The Board of Directors has decided to recognize the SMEs on the website. Once a person selects a test, they would land on a page listing all the SMEs that contributed to the test and from there, start their test. We will also send a letter and a certificate of appreciation to the SME with a copy to their supervisor or manager, thanking them for their efforts on this worthy project.

continued on page 2

Chairman's Column Continued

The Board of Directors, in addition to recognizing the SMEs, decided to list those that have achieved Professional Certification in the newsletter. There will be one voting item, for the General Membership, on the definitions of "voting", "informational", "developing" and "withdrawn" to be placed at the beginning of Handbook 44 and Handbook 130. We hope this helps everyone involved in the process, and those who may make proposals, better understand these terms. We are also going to list them in Publications 15 and 16 for reference.

I have appointed Michael Cleary to be chairman of a Training Manual Work Group. Mike has experience in development of training materials in his previous positions with the state of California and is excited about this project. This work group will initially report to the Board and I expect it to be turned over to the PDC at some point (we don't want to distract them from their work on the Professional Certification Program at this time). If you are interested in being part of this Work Group, please contact me at steve.benjamin@ncagr.gov. I expect to round out the Toolkit Work Group shortly and have them begin their tasks – anyone with ideas or wishes that you would like to see included may contact me.

The NTEP Committee, and the Board, discussed hiring a new employee and the expansion of the Verified Conformity Assessment Program (VCAP). These two issues are linked in that the current workload is manageable for Jim Truex, but an expansion to other devices will require another employee. We are in the process of defining this position to proceed with what is best for NTEP and NCWM. With regards to VCAP, many industry members would like the program to go "all in", adding the rest of the devices subject to T.N. 8. This is one option the NTEP Committee is considering, but could only act on it with the additional staff in place.

In closing, thank you to all who attended the meeting, I think it was time well spent. I would also like to thank the NCWM staff - Don, Jim, Shari and LuAnne as they are the ones that keep the meeting running smoothly and addressing any issues that arise. In May, I look forward to visiting the CWMA in Overland Park in KS and NEWMA in Saratoga Springs, NY.

Stephen Benjamin

-- Stephen Benjamin
NCWM Chairman

Read Our Fan Mail

It almost makes us blush.

One customer wrote, “You guys are on top of it!”

Another declared,
“We passed our audit with flying colors, thanks to you.”

Yet another penned, “With such quick turnaround,
one might expect less service. Not so!”

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Committee News
2013 Interim Meeting

Laws and Regulations Committee

The 2013 Laws and Regulations (L&R) Committee Interim Agenda consisted of 24 items. Presentations and written testimony submitted to the Committee are available on the NCWM website. The Fuels and Lubricants SubCommittee (FALS), Package and Labeling SubCommittee (PALS) and the Printer Ink and Toner Cartridge Gravimetric Testing Work Group met at the Interim meeting and reported to the L&R Committee. Kurt Floren, Chair for the Moisture Loss Work Group, reported that he is looking for members for this new Work Group.

The L&R Committee designated the status for each of the agenda items as follows:

231 NIST HB 130 - UNIFORM PACKAGING AND LABELING REGULATIONS:

231-1 Sections 6.12. Supplementary Quantity Declarations and 6.14. Qualification of Declaration Prohibited. The Committee designated the item as **Withdrawn**. PALS is examining this question and related labeling concerns, and will introduce a new proposal when the Sub-Committee completes development of the item.

231-2 Section 10.3. Aerosols and Similar Pressurized Containers. The Committee designated the item as **Informational.**

232 NIST HB 130 - UNIFORM REGULATION FOR THE METHOD OF SALE OF COMMODITIES:

232-1 NIST Handbook 130 - Uniform Weights and Measures Law: Section 2.27. Retail Sales of Natural Gas Sold as a Vehicle Fuel. The Committee designated the item as **Informational.** The L&R Chair asked the NCWM Chair to appoint a Steering Committee to involve stakeholders, and gather information on this item and the related L&R and S&T items.

232-2 Section 2.33. Oil, 2.33.1.4.1. Inactive or Obsolete Service Categories. The Committee designated the item as **Informational**. FALs will develop.

232-3 Section 2.33. Oil, 2.33.1.4.5. Tank Trucks or Rail Cars. The Committee designated the item as **Voting.**

232-4 Section 2.XX. Printer Ink and Toner Cartridges Labeling. The Committee designated the item as **Voting,** with count as the method of sale.

237 NIST HB 130 - UNIFORM ENGINE FUELS AND AUTOMOTIVE LUBRICANTS REGULATION:

237-1 Section 1.15 Diesel Liter Equivalent (DLE) and Section 1.16 Diesel Gallon Equivalent (DGE). The Committee designated the item as **Informational.** FALS will examine the energy equivalency numbers submitted in this proposal. In addition, the L&R Chair asked the NCWM Chair to appoint a Steering Committee to involve stakeholders, and gather information on this item and the related L&R and S&T items.

237-2 Section 2.1.4. Minimum Antiknock Index (AKI), Section 2.1.5. Minimum Motor Octane Number, and Table 1. Minimum Antiknock Index Requirements. The Committee designated the item as **Informational** FALS will develop.

237-3 Section 2.1.5. Minimum Motor Octane Number. The Committee designated the item as **Informational.** FALS will develop.

237-4 Section 3.13. Oil, 3.13.1.4.1. Inactive or Obsolete Service Categories. The Committee designated the item as **Informational.** FALs will develop.

237-5 Section 2.33. Oil, 3.13.1.4.5.Tank Trucks or Rail Cars. The Committee designated the item as **Voting.**

237-6 Section 3.15. Biodiesel and Biodiesel Blends. This item is **Withdrawn**.

237-7 Engine Fuels and Automotive Lubricants Regulation, Sections 3.2., 3.8., and 3.9. The Committee designated the item as **Withdrawn.**

237-8 Section 4.3. Dispenser Filters. The Committee designated the item as **Informational.** FALS will develop this item.

237-9 Section X.X Flex Fuel Vehicles. The Committee designated the item as **Informational.** FALS will develop this item.

260 NIST HB 133:

260-1 Section 2.3.8. Moisture Allowance – Pasta Products. The Committee designated the item as **Voting**
.

260-2 Section 3.10. Animal Bedding. The Committee designated the item as **Voting.** A 4 year total exception to MAVs is included to allow time for NIST to work with industry on recommendations for an appropriate exception to MAVs.

260-3 Gravimetric Testing of Printer Ink and Toner Cartridges. The Task Group completed its work, and The Committee designated the item as **Withdrawn.**

260-4 Section 4.5. Paper Plates and Sanitary Paper Products. The Committee designated the item as **Voting.**

270 OTHER ITEMS - DEVELOPING ITEMS: L&R SubCommittees and Work Groups. The subCommittees and Work Groups of the L&R Committee will develop the items already noted.

270-1 Uniform weights and measures law, section 1. definitions. The Committee designated the item as **Voting.**

270-2 Uniform method of sale regulation, section 2.xx. retail sale of electricity/ vehicle. The Committee designated the item as **Voting.**

L&R SUBCOMMITTEES AND WORK GROUPS:
270-3 D Fuels and Lubricants SubCommittee
270-4 D Packaging and Labeling SubCommittee
270-5 D Moisture Loss Work Group

— Judy Cardin, Committee Chair
Wisconsin

Specifications and Tolerances Committee

The Specifications and Tolerances (S&T) Committee agenda consisted of 25 items. The S&T Committee held a conference call on the 17th of January for an agenda review. During the Open Hearings the Committee received a large volume of comments. Thank you to everyone at the conference for their participation.

320 SCALES:

320-1 S.6.4. Railway Track Scales and Appendix D – Definitions. During the open hearing the Committee heard recommended language from the NIST OWM. The original submitter and ARR supported the item with the recommended changes from OWM. The Committee designated the item as **Voting.**

320-2 Table 4 – Minimum Test Weights and Test Loads. Open hearing testimony was in opposition from both SMA and Fairbanks, representing the submitter, to withdraw the item. The Committee designated the item as **Withdrawn.**

320-3 T.N.3., Table 6. Maintenance Tolerance. The Committee did not believe identifying the table in terms of "d" would be of value and is incorrect. The Committee agreed that examples to demonstrate how tolerances are determined are more suited in a training manual. With proper training a user can understand "d" or "e" are not always equal for all classes of scales and which to use in Table 6 would be clearer. The Committee designated the item as **Withdrawn.**

320-4 Appendix C – Units of Mass (tons). With the proposed abbreviation change, the Committee realized some existing equipment may be affected if adopted. In consideration, the Committee is seeking comments from concerned parties who will be unable to make the change. To compliment the change the Committee proposed a footnote to Appendix C. As of January 1, 2014, "tn" is the required abbreviation for the short ton. Devices manufactured between January 1, 2008 and December 31, 2013 may use an abbreviation other than "tn" to specify short ton. Another proposed change would appear beneath the heading "Avoirdupois Units of Mass" on page C-6 of HB44 with the same footnote as above.
The Committee designated the item as **Voting.**

321 BELT-CONVEYOR SCALES SYSTEMS:

321-1 UR.2.2. Conveyor Installation. The Committee noted the paragraph is correctly titled however the number is not. The correct number is UR.1.2 (h) which is the Item Under Consideration. With supporting comments from the USNWG and hearing additional favorable comments, The Committee designated the item as **Voting.**

321-2 Appendix D – Definitions: Belt Revolution, Belt Loader, Integrator, Loading Point, and Master Weight Totalizer. All comments received during the open hearing were in support of the new definitions as well as the amended definitions. The Committee designated the item as **Voting.**

330 LIQUID MEASURING DEVICES

330-1 S.1.6.4.2 (a) Product Identity and UR.3.2. Unit Price and Product Identity. The Committee heard overwhelming opposition to this proposal from industry as well as from the regulatory community. The majority of comments were that the problem of misfueling vehicles would not be solved by this proposal. The Committee designated the item as **Withdrawn.**

330-2 Table T.2. Accuracy Classes and Tolerances for Liquid Measuring Devices. As a table clarification the Committee agreed to move this item forward as a **Voting** item.

330-3 N.4.2.4. Wholesale Devices. During the Open Hearings the Committee heard modified language from OWM pertaining to Special Test N.4.2.4. The Committee received favorable comments on this new language from the conference attendees. This portion of the proposal was moved forward as a **Voting** item. However, the User Requirement portion of the proposal was not well received. Therefore the Committee agreed to **Withdraw** the user requirement portion of the proposal.

331 VEHICLES-TANK METERS

331-1 Table 1. Accuracy Classes and Tolerances for Vehicle-Tank Meters. Similar to item 330-2 previously discussed. The Committee designated the item as **Voting.**

331-2 Product Depletion Test. The Committee heard several comments for support of this item and The Committee designated the item as **Voting.**

336 WATER METERS

336-1 UR.3. Installation Requirements. The Committee believed the proposal to have merit even though it is already stated in the General Code. The Committee reworked the item specifically for one type of water meter, utility-type. The Committee designated the item as **Voting.**

337 MASS FLOW

337-1 Appendix D – Definitions. Diesel Liter and Diesel Gallon Equivalents (DLE, DGE). This item is similar in scope to Item 337-2 as well as additional items in the L&R Committee's agenda for the use of DLE and DGE in the market place. The Committee Chairs of both Standing Committees agreed to form a workgroup to study all of these items. The Committee designated the item as **Informational.**

337-2 S.1.2. Compressed Natural Gas Dispensers, S.1.3.1.1. Compressed Natural Gas Used as an Engine Fuel, S.5.2. Marking of Gasoline Volume Equivalent Conversion Factor. Please refer to the previous comments in item 337-1. The Committee designated the item as **Informational.**

337-3 Table T.2. Accuracy Classes and Tolerances for Mass Flow Meters. This item is similar to 330-2 and 331-2 and The Committee designated the item as **Voting.**

354 TAXI METERS

354-1 Global Positioning Systems. Currently a USNWG on Taximeters is working on issues related to GPS-based system applications, The Committee designated the item as **Developing.**

continued on page 8

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Specifications and Tolerances Committee Continued

356 GRAIN MOISTURE METERS

356-1 Table S.2.5. Categories of Devices and Methods of Sealing. The Committee heard no opposition on this item and The Committee designated the item as **Voting.**

356-2 UR.3.4. Printed Tickets. The Committee heard no opposition on this item and The Committee designated the item as **Voting.**

356-3 Appendix D- Definitions: Remote Configuration Capability. With the rapid develop of emerging technologies the Committee does not believe that modifying current definitions is the correct path. Possibly a better approach would be to develop an entirely separate set of security requirements. Therefore the Committee is requesting other Sectors to review the Grain Sector's proposal and provide input. The Committee designated the item as **Developing.**

360 OTHER ITEMS – DEVELOPING ITEMS

360-1 D International Organization of Legal Metrology (OMIL) Report

360-2 D G-S.1. Identification.-(software)

360-3 D Part 3.30. Price Posting and Computing Capability and Requirements for a Retail Motor-Fuel Dispenser (RMFD). The Task Group modified existing language in UR.3.3. (c) and a related note. The Committee decided to establish a new Informational Item for this modification. As the Task Group continues to develop guidelines and examples for this code change, the Committee is retaining this item as **Developing.**

360-4 D Part 2.20. Weigh-In-Motion Vehicles for Law Enforcement – Work Group. During the Open Hearings the Chairman of the USNWG on WIM suggested the draft code is ready for review and requested the item to be moved to **Informational**. With other supporting comments the Committee decided to move the item forward as **Informational.**

360-5 D S.5. Provision for Security Seals

360-6 D Global Positioning Systems for Taximeters. The Committee agreed to maintain the status of these five items as **Developing.**

I wish to express my gratitude to the Committee Members and the Technical Advisors from NIST and Measurement Canada for all their hard work to assure that the agenda was completed on time.

-Kenneth Ramsburg, Committee Chair
Maryland

Professional Development Committee

The Professional Development Committee (PDC) continues to focus on five discipline areas under the Committees purview: Professional Certification Program, Instructor Improvement, Topics for Conference Training, Safety Awareness, Website development and Publications.

410 EDUCATION

410-1 Professional Certification Program. Report Cleanup: At the 2013 Interim Meeting, the Committee agreed to move the historical data in the current item to Appendix C, with the intention of moving it into the Committee Archives at the 2014 Interim. Moving forward, historical information will be archived (http://www.ncwm.net/content/pdc-archive) and agenda items will contain only new information and action items.

Basic Proficiency Exams on NCWM Test Site: NIST OWM will be using the NCWM test site to administer proficiency tests which will be used as qualifying prerequisites for OWM courses. The tests will be open to members and non-members alike at no fee. The first exam, which will be on the NCWM test site, will be a Handbook 44 Self-Study Course Exam. Contact NIST OWM for further information.

Feedback from Registered Service Agents (RSA's) after taking Certification Exam: Registered service agents (RSA's) were asked in 2012 to take the certification exams and provide the Committee with feedback on the suitability of the exams for RSA's. RSA's advised that test-takers practice good test-taking strategies such as answering easy questions first; then looking up skipped questions; and if time allows, verifying the answers they thought were easy. RSA's also questioned the appropriateness of some of the fundamentals questions: For example, questions on NCWM voting bylaws. They would also like to get feedback on how they did on each section of the test even if they can't be told which specific questions they got wrong.

The Committee reported that password generation for the exams will be automated when the NCWM website is updated. They would also like to direct people with questions about the contents of an exam to the hotlinks embedded in the course descriptions which appear at the certification site. (http://ncwm.net/examinations)

Status of Current tests: The tests currently available are RMFD, Small Capacity Retail Scales, and Basic Package Checking. The Committee reported that exam statistics show steady improvement over time, indicating that much of the initial problem with passing tests has to do with a need to acclimate to on-line testing.

Status of New Tests: The VTM exam is in development now. SME's are currently writing the questions. The Certification Coordinator is currently seeking SME's for Medium Capacity Scales, and Large Capacity Scales Class III and IIIL.

Professional Development Committee Cont...

The Committee thanks those who have already volunteered to be SME's.

The Committee also assured members that SME's will not compromise their ability to be trainers as no SME will be allowed to have access to more than 25% of the questions. This restriction on access to the test questions is an important part of maintaining the integrity of the exam process as the Certification Program moves toward formal accreditation. Eventually, NCWM may need to copyright the exams. SME's should note that they should modify test questions before submitting them to the Certification Coordinator if they wish to continue to use those questions in their own exams.

Certification Coordinator Reported on Exam Question Pass/Fail Statistics: Exam statistics indicate that most test-takers had more difficulty with general questions and fundamental questions than they did with device specific questions. This indicates that there is a training imbalance between general principles and device specifics.

410-2 Training. The Committee recommended that a new item dealing with training be inserted and subsequent item numbering be adjusted. The purpose of this item is to share information gleaned from the certification test statistics regarding broad training needs, and to serve as a link to various training materials on the web. Eventually, it can become a home for the training material program currently under development by the NCWM Board of Directors.

410-3 Instructor Improvement. Report Cleanup: At the 2013 Interim Meeting, the Committee agreed to move the historical data in the current item to Appendix D, with the intention of moving it into the Committee Archives at the 2014 Interim. Moving forward, historical information will be archived and item will contain only current action items.

Current Items:
NIST OWM is looking for a way to increase the number of trainers available to teach OWM courses. OWM will host a Train-the-Trainer course in April, 2013 with the intention of developing a pool of individuals capable of offering NIST OWM training at the regional level. The training is free, and OWM asks for a minimum commitment from each participant of leading one or two training courses with a NIST OWM trainer in the subsequent year. Expenses involved with teaching the course(s) would be covered by OWM.

410-4 Recommended Topics for Conference Training. The Committee recommends that the regional associations and NCWM consider offering training on:

- Making Sense of Electronic Receipts;
- Training the Trainer in Adult Learning Techniques;
- Ethics for weights & measures officials;
- Data privacy issues faced by weights & measures officials.

420 PROGRAM MANAGEMENT

420-1 Safety Awareness. Below is the 2012 list of the Regional Safety Liaisons. Regional Associations should update the Committee if those assignments have changed.

Central Weights and Measures Association (CWMA):
Ms. Julie Quinn, Minnesota Weights and Measures Division
Northeastern Weights and Measures Association (NEWMA):
Mr. Michael Sikula, New York Bureau of Weights and Measures
Southern Weights and Measures Association (SWMA):
Mr. Matthew Curran, Florida Department of Agriculture and Consumer Services
Western Weights and Measures Association (WWMA):
Mr. Douglas Deiman, Alaska Division of Measurement Standards/CVE

The Committee will continue asking the regions to prepare articles for the NCWM Newsletter and plans to notify the Regional Safety Liaisons as their assignment dates approach.

420-2 PDC Publication. Background/ Discussion: The NCWM web site is being redesigned. The FAQ document presented at the 2012 Annual Meeting will be added to the web site at the time of the update. The Committee will review relevant documents when the update is complete to ensure that interested parties can easily find and utilize the materials.

- Julie Quinn, Committee Chair
Minnesota

New Slate of Officers Nominated

NCWM Nominating Committee chaired by Kurt Floren, Los Angeles, met at the 2013 Interim Meeting in Charleston, South Carolina to select a slate of candidates for officers of NCWM. The Nominating Committee gives careful consideration to professional experience, individual qualifications, conference attendance and participation, and other factors of importance in selecting officers who will lead this organization into the future. Those who are elected will selflessly give of their time and talents for the betterment of the mission of NCWM.

The following slate will be presented for election at the 98th NCWM Annual Meeting this July in Louisville, Kentucky:

CHAIRMAN-ELECT:
Ronald Hayes, Missouri

BOARD OF DIRECTORS ACTIVE MEMBERSHIP - SOUTHERN:
5 Year Term
Terence McBride, Tennessee

BOARD OF DIRECTORS ASSOCIATE MEMBERSHIP:
3 Year Term
Christopher Guay, Proctor and Gamble

BOARD OF DIRECTORS AT-LARGE:
5 Year Term
Chuck Corr, Archer Daniels Midland

TREASURER:
1 Year Term
Mark Coyne, Massachusettes

NTEP: Mixing and Matching Main Elements of a Scale-How to Determine Compliance/Part II

NTEP Article: Mixing and Matching Main Elements of a Scale – How to Determine Compliance / Part II.

In the 2012 Issue 2 article we looked at the different main elements of a scale and NTEP certificates for the main elements. We reviewed NIST Handbook 44 (H44) Scales Code terminology for an indicating element not permanently attached to weighing and load receiving element, weighing and load receiving element not permanently attached to indicating element, main element, and load cells for which an NTEP Certificates of Conformance (CC) had been issued.

In the 2012 Issue 3 article we discussed the use of NTEP worksheets to help the inspector with the determination of compliance when separate main elements are married together. That article took us through the completion of a worksheet for a Class IIIL electromechanical vehicle scale. This article will take us through the completion of a worksheet for a Class IIIL fully electronic vehicle scale. The example worksheet used with this article (on page 13) is an actual scale system evaluated by the Ohio NTEP Laboratory.

It is highly recommended that regulatory officials complete the worksheet upon initial inspection of a newly installed scale and modified scale installations, where one or more of the main elements have been replaced. The intent of the worksheet is to complete the top section (boxes numbered 1 through 45) first. Manufacturer's ID, model, serial number, NTEP CC number, accuracy class and n_{max} should be marked on all three main elements. However, please note that note 11 in table S.6.3.b. allows most required markings to be in an accompanying document rather than on the load cell. Additional markings for the indicating element include: nominal capacity, value of d and CLC. Additional markings for the weighing element include: nominal capacity, CLC and e_{min}. Additional information required for the load cell include: v_{min} and single (S) or multiple (M) cell certification by NTEP. At this point, we see and understand the intent of H44 marking requirements found in Table S.6.3.a. of the Scales Code. With this information we can fill in the boxes on the top portion of the worksheet with the exception of boxes 19, 43, 44 and 45, which are not marking requirements. It will take a little more effort but it is information we need to answer the 5 suitability questions on the bottom of the worksheet.

- Box 19 requires us to determine the number of divisions (n) for which the scale system being inspected is set up. This is done by dividing the capacity (200 000 lb) by the division size (20 lb), so 10 000 n in this case. [Technical note: Handbook 44 states that the number of n is determined by dividing the capacity by the verification scale division (e). Table S.6.3.b., Note 4 requires a marking of "e" only if different from "d", which is very unlikely, especially for large capacity scales.]

- Box 43 asks us to determine the number of sections in the scale being tested. H44 defines a scale section as the "part of a vehicle, axle-load, livestock, or railway track scale consisting of two main load supports, usually transverse to the direction in which the load is applied." [Technical note: Another way to state the formula is the number of load bearing points divided by 2. For an example, see H44, Scales Code, Paragraph N.1.3.3.2., which includes an excellent illustration of a three section platform scale.] In this case we have 10 load cells, so five sections.

Continued on pg. 12

NTEP: Continued...

- Box 44 requires us to determine how many load cells are utilized in the scale being inspected; in this case 10. [Technical note: Table S.6.3.b., Note 7 states that it is acceptable to use a load cell with a single cell (S) designation in a multiple cell application but a load cell with a multiple cell (M) designation can only be used in multiple cell applications. Compliance with the requirement should also be verified.]

- Box 45 asks us to record the scale multiple. This information is only applicable to mechanical lever system weighing elements when used with a load cell in an electromechanical system installation and is not applicable in this case.

Now that we have completed all the applicable boxes on the top portion of the worksheet we can work to answer the five suitability criteria questions on the bottom of the worksheet.

- Question 1 requires us to compare the e_{min} value marked on the weighing element [Box 32] with the division size for which the system under inspection is set-up [Box 16]. The e_{min} value is the smallest division for which the weighing element complies with applicable requirements so the system cannot use a division size less than the value. In this case the value marked on the weighing element (20 lb) is less than or equal to the system division size (20 lb), so the scale system meets the requirement and we check yes in the box on the worksheet.

- Question 2 requires us to look at the n_{max} value for each individual main element [Boxes 37, 38 and 39] and compare the smallest value to the number of divisions for the system [Box 19]. The n_{max} is the maximum number of divisions for which the element complies with applicable requirements and is stated on the NTEP CC. In this case all three elements had an n_{max} of 10 000 and the system was also set up for 10 000 divisions, so the scale complies and we check yes. [Another example could be a system where the n_{max} values for the main elements were not the same. Suppose we had n_{max} values for the indicator = 10 000 , weighing element = 5000 and load cell = 6000. In that case it could be possible for the three elements to be interfaced together but only if the system were set up for 5000 divisions or less because the limiting factor would be the 5000 maximum number of divisions value for the weighing element.]

- Question 3 is looking for compliance with H44, Scales Code, paragraph S.6.1., which requires the marked nominal capacity for the system [Box 13] to be less than or equal to the CLC times the number of sections [Box 43] minus 0.5. As a formula, this is stated as **Capacity ≤ CLC x (N – 0.5)**. Looking at our example worksheet we see that 200 000 lb is less than 270 000 lb, so it meets the requirement and we check yes.

- Questions 4 and 5 require a determination of the appropriate relationship of the load cell verification value (v_{min}) to the scale division. The requirement is traceable to H44, Scales Code, paragraph S.5.4. Notice that we only need to answer one of the suitability criteria question on the worksheet per scale system. Use the suitability criteria 4 formula if the scale does not have a lever system (fully electronic) or suitability criteria 5 formula if the scale has lever system and uses a load cell or cells (electro-mechanical). In this case we have a full electronic system and question 5 is not applicable. Question 4 tells us to compare the v_{min} value for the load cell used, which is required to be less than or equal to the division size of the scale divided by the square root of the number of load cells in the scale. As a formula, this can be stated as $\mathbf{v_{min} \leq d \div (\sqrt{N})}$. So we look at the value in Box 24 (2.0 lb) and make sure it is less than or equal to Box 16 (20 lb) ÷ the square root of Box 44 (the square root of 10 is 3.16). When we plug those numbers into the formula it results in 2.0 ≤ (20 ÷ 3.16). 2 is less than 6.33, so the load cell complies with the requirement and we check yes on the worksheet.

Use of the worksheet for initial verification can not only help us determine that the installation meets H44 suitability criteria but also that all required markings were available. NTEP is providing this information because of the large number of requests for guidance from the states, installation agencies, service agencies and manufacturers. Hopefully this article has helped you understand the importance of initial verification and NIST Handbook 44 marking requirements to determine if the elements are interfaced together properly to comply with applicable requirements. The next newsletter articles will provide a worksheet example of a Class III hopper scale .

If you would like to discuss the content of this article contact Jim Truex at jim.truex@ncwm.net.

continued on pg. 13

NTEP: Continued

National Conference on Weights and Measures / National Type Evaluation Program

NTEP Worksheet – Class III L

Company: Cardinal Scale Location: Webb City, Missouri Date: May 2012

	MARKINGS	INDICATING ELEMENT		WEIGHING ELEMENT		LOAD CELL(S)	
Information found on the device identification plate, badge or display.	Manufacturer	1	Cardinal Scale	2	Cardinal Scale	3	Cardinal Scale
	Model	4	225	5	100070-PSC	6	CBC50K
	Serial Number	7	I54321	8	W78910	9	LC12345
	Class III, III/III L, III L	10	III/IIIL	11	IIIL	12	III/IIIL
	Capacity	13	200 000 lb	14	200 000	15	NA
	"d" Scale Division Value	16	20 lb	17	NA	18	NA
	"n" for the System (divide box #13 by box #16)	19	10 000	20	NA	21	NA
	"v_{min}" Verification Scale Division	22	NA	23	NA	24	2.0 lb
	"CLC" Concentrated Load Capacity (vehicle scale only)	25	30 ton (60 000 lb)	26	30 ton (60 000 lb)	27	NA
	"See Cap" Section Capacity (livestock scale only)	28	NA	29	NA	30	NA
	"e_{min}" Minimum Scale Division	31	NA	32	20 lb	33	NA
Found on CC	CC Number (required on new mfg. devices after 1/1/03)	34	01-011A6	35	12-063	36	11-094
	"n_{max}" Maximum Number of "d"	37	10 000	38	10 000	39	10 000 m (IIIL)
Info from Site	Single Cell (S) or Multiple Cells (M)	40	NA	41	NA	42	M
	Number of Sections	43	5	Number of Load Cells "N"		44	10 cells (5 sections)
	*NOTE: If the weighing element is a lever system, enter the lever (scale) multiple here:					45	NA

Suitability Criteria

						Meets Requirements		
1	**e_{min} ≤ d** Enter # from **Box 32**		Enter # from **Box 16**			Yes	No	NA
46	20 lb	≤	47	20 lb	→	x		
2	**"n" (for the system) ≤ n_{max} (smallest of any one element)** Enter # from **Box 19**		Enter in **Box 49** (smallest # from Box 37 OR Box 38 OR Box 39)					
48	10 000	≤	49	10 000	→	x		
3	**Capacity ≤ CLC (No. sections – 0.5)** Enter # from **Box 13**		Enter in **Box 51** (Calculate: # from Box 25 times (# from Box 43 minus 0.5)					
50	200 000 lb	≤	51	60 000 lb x 4.5 = 270 000 lb	→	x		
4	**v_{min} ≤ ("d" / (√ "N")) This is for a Full Electronic Scale.** Enter # from **Box 24**		Enter in **Box 53** (Calculate: Box 16 divided by the square root of Box 44)					
52	2 lb	≤	53	20 lb ÷ (√10 is 3.16) = 6.33	→	x		
5	**v_{min} ≤ ("d"/ (√"N" x scale multiple)) This is for Electro-mechanical Lever Systems.** Enter # from **Box 24**		Enter in **Box 55**(Calculate:divide Box 16 by the square root of Box 44, times Box 45)					
54		≤	55		→			x

Behavior-Based Safety: A New Way to Augment Your Safety Program

Gather together any group of people and ask everyone to stand if they have ever had to climb on something to reach an object, change a light bulb, paint or do some other chore. Most everyone will stand. Now ask them to sit if they have NEVER used a chair, stool, table or other inappropriate object instead of getting a step stool or ladder. Almost everyone will remain standing. Ask them to sit if they have NEVER performed an unsafe action while on a ladder like 'walking' the ladder, standing on the very top rung, or over-reaching to one side. Most will still remain standing. Ask if any of them have ever been seriously injured because of unsafe behavior on a ladder or step stool. Maybe one or two at most will sit down, but it is quite possible that everyone will still remain standing. Now ask how many knew that they were acting unsafely at the time. Suddenly, everyone is sitting.

For the most part, people know when they are taking unnecessary risks, and yet they do so anyway. Safety experts have been studying this phenomenon for the last 20-30 years and have come up with an explanation of why so many people take risks even when they know better, and how organizations can overcome the obstacles which keep their safety programs from being effective. The approach is called Behavior-Based Safety and it addresses the reasons people choose unsafe behaviors over safe behaviors even when they know better and they have all the resources they need to do things correctly.

Having the necessary resources before embarking on a Behavior-Based Safety Program is a fundamental prerequisite. Engineering out identified hazards is still the most effective weapon in a safety manager's arsenal because it eliminates the opportunity for unsafe behaviors or conditions in the first place. When hazards cannot be completely eliminated, then a safety program with personal protective equipment, safety procedures, policies, and training are the next line of defense.
Unfortunately, even the best safety programs have a critical weakness. Employees must choose to comply with the program each and every time they do their jobs. Why wouldn't an employee do that? It is, after all, the employee who is at risk. One would hope the employee would be happy to comply with safety practices designed to protect his or her well-being.

Paradoxically, it is exactly because the employee faces the risk that the employee feels entitled to be the one to weigh the seriousness of that risk versus the cost in time, inconvenience, or discomfort he or she is willing to tolerate to avoid it. Experience teaches employees that most of the time they can take risks without significant consequences. The risk of falling while standing on an office chair to reach a file on an upper shelf may seem small compared to the time and inconvenience of going to get a step-stool. That is unless you end being the rare person with a spinal-cord injury because of the fall.

The risks of unsafe behavior may seem unlikely or inconsequential, but the rewards for taking chances can be very real. Employees commonly receive verbal or written praise for being fast and efficient with company resources. They may even receive monetary awards and promotions for reducing costs or increasing productivity. It is rare however for supervisors to recognize individual employees for safe behavior even in organizations which tally injury free days. Is it any wonder then that employees will choose to ignore safety policies if those policies slow them down or inconvenience them as they work?

Behavior-based safety initiatives seek to change the risk equation to favor safe behaviors over unsafe behaviors by eliminating obstacles which make safety more time-consuming or costly and by rewarding specific safe behaviors and a positive safety culture in general. The basic components of a program include:

- A steering committee familiar with the safety program which identifies a few critical behaviors that can be objectively observed and recorded, and then designs an audit form for those activities --- wearing a safety vest, steel-toed boots, hard-hat, and safety glasses when unloading thousand pound weights on the dock for example.

- Anonymous safety audits. The person doing the audit is identified so he can be rewarded for participation later but the person being audited is kept a secret. It is very important that audits never result in negative consequences or co-workers will be unwilling to perform them and the chance to gather valuable information will be lost. In a successful program, audits will be a casual, everyday occurrence. John walks by as employee Y is unloading weights and tells employee Y that he would like to audit him for a few minutes. John records what he observes on an audit form noting everything that was done correctly. He then gives employee Y some immediate feedback, asks a few questions, and goes on his way.

- Immediate positive feedback from the auditor at the time of the audit. Both parties benefit from this interaction. The audited employee gets immediate recognition for any safe practices he was employing. "Way to go for wearing your steel-toed boots and hard hat!" The auditor gets the warm feeling of being able to give positive reinforcement to a co-worker, and is also more likely to follow safety procedures in the future because the audit list is fresh in his mind and because he doesn't want to seem like a hypocrite if he doesn't follow procedures.

- Respectful, non-judgmental curiosity about safety behaviors which did not occur. The auditor is not there to discipline or correct his co-worker but to gather information for the steering committee. "Tell me about your decision not to wear a safety vest or safety glasses." The auditor then records the impediments listed by the employee. "The safety vest is too tight over my jacket and the dock is cold with the door open. I didn't want to make the driver wait while I found a pair of glasses."

- Verbal, written, and other rewards for participation as an auditor. The information gathered in audits is critical in eliminating unsafe behaviors and ultimately will result in savings due to a

NCWM Welcomes New Members (10/1/12-2/11/13)

Grant Allen
7-Eleven, Inc.
Lynn Babbitt
Regulatory Compliance, Mandelez International
Kevin Batchelor
California Division of Measurement Standards
Derrick Bradley
Franklin Country Weights and Measures
Steve Cartwright
Cygnus Automotive
John Cheney
Pinnacle Scale LLC
Linda Crown
NIST, Office of Weights and Measures
Jolene Dessert
Imperial County
Mark DiGregori
Tolt Service Group
Edward Dougherty
Sunoco, Inc.
Sherry Estabrooks
California Division of Measurement Standards
Stephen Feint
Cortland County Weights & Measures
Ron Gadman
Scale Weighing Systems
Won Jung
Nau Computer, Inc.
Ronnell Gallon
Zenner Performance Meters, Inc.
Amanda Gray
Arizona Petroleum Marketers Association
Paul Haas
Minnesota Weights and Measures Division
Paul Leduc
City of Waterbury CT
Robert Lee
Shanghai Yaohua Weighing System Co., Ltd
Hector Lemus
CleanFUEL USA
Sam Lima
Utah Department of Agriculture and Food
Jason Long
Missouri Department of Agriculture
Michael Manahl
Iowa Department of Agriculture and Land Stewardship
Anthony Martin
Good's Technology Services
William McPherson
Columbus Weights and Measures
Anthony Melo
Foster Farms Poultry
Vito Mensah
Franklin County Weights and Measures
David Mercer
Mass Properties
Mark Moody
Cooling and Applied Technology Inc.
Doug Neff
Missouri Department of Agriculture
Jason Oho
City of De Pere Health Department
Tina Paez
City of Houston - ARA Department
Bimal Patel
Wayne, A GE Energy Business
Guadalupe Perez
R.G.V. Scales
Brenda Perez-Lopez
Senior Associate Prinicipal
Melissa Plaugher
Allen County Weights and Measures
Ted Power
Viewtrak Technologies, Inc.
Benjamin Rham
AP Dataweigh, Inc.
Danielle Reddick
Missouri Department of Agriculture
Dan Robertson
Preble County Auditors Office
Lynn Schultz
Minnesota Weights and Measures Division
Stephen Sheehan
Defiance County Auditors Office
Alex Smith
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Kraft Foods Group
Ron Travis
Travis Scale Company
Valerie Ughetta
Alliance of Automobile Manufacturers
Jim Wadsworth
Greene County Indiana Weights and Measures
Yanling Wang
Zhejiang South-Ocean Sensor Manufacturing Co., Ltd.
Adam Wedde
Minnesota Weights and Measures Division
William Wen
Wanto Precision Technology Co., LTD
Steven Wolfe
Cardinal Point Partners, LLC

Behavior-Based Safety: Cont.....

reduction in injury claims and lost time. Employees need to receive tangible rewards for gathering that information just as if they had saved the organization time and money in other ways.

• Regular reviews by the steering committee resulting in corrective actions. The steering committee reviews the information and makes recommendations for corrective action to management. "Replace current uniform jackets with high visibility jackets so employees don't have to choose between being warm and being safe. Put a receptacle for safety glasses by the dock door so they are always at hand."

• Buy-in from all levels, especially management. The program will die if management does not follow through on steering committee recommendations, or if management is seen as being outside the safety program altogether. In the most successful programs, managers can be audited just like any employee, and should conduct audits just like any employee as long as they can discipline themselves to give out positive feedback and to gather information only. Following up on the committee recommendations is the most critical component however. Employees need to see that audits result in positive changes or they won't continue to do them.

You can find many books and consultants on the internet to help you design a safety-based program if you are interested. A relatively inexpensive introduction to the topic is the book Removing Obstacles to Safety: A Behavior-Based Approach by Judy Agnew and Gail Snyder (Performance Management Publications, 2002).

If you already have a safety program in place and have reached a plateau in your safety improvements which does not seem to respond to new equipment, policies, disciplines, or procedures, it may be time to see what obstacles are preventing your employees from following safety procedures. A behavior based safety program can help you identify and remove those obstacles, tipping the scales in favor of safe working practices.

- Julie Quinn
Minnesota Department of Commerce

National Conference on Weights and Measures
1135 M Street, Suite 110 / Lincoln, Nebraska 68508

2013 Event Calendar

Be sure to mark your calendar for all the upcoming NCWM and regional meetings.

March

MAR 19-20

NTEP Software Sector Meeting
Columbus, Ohio — Embassy Suites Hotel Columbus
Contact: NCWM **P.** 402.434.4880
E. info@ncwm.net **W.** www.ncwm.net

May

MAY 6-9

Northeastern Annual Meeting (NEWMA)
Saratoga Springs, New York — Holiday Inn Saratoga Springs
Contact: James Cassidy **P.** 617.349.6133
E. jcassidy@cambridgema.gov **W.** www.newma.us

MAY 20-23

Central Annual Meeting (CWMA)
Overland Park, Kansas — Doubletree by Hilton
Contact: Sherry Turvey **P.** 785.862.2415
E. Sherry.Turvey@kds.ks.gov **W.** www.cwma.net

July

JUL 14-18

NCWM Annual Meeting
Louisville, Kentucky — The Seelbach Hilton Louisville
Contact: NCWM **P.** 402.434.4880
E. info@ncwm.net **W.** www.ncwm.net

August

AUG 21-22

NTEP Grain Analyzer Sector Meeting
Kansas City, Missouri — Chase Suites
Contact: NCWM **P.** 402.434.4880
E. info@ncwm.net **W.** www.ncwm.net

August Cont...

AUG 27-28

NTEP Weighing Sector Meeting
Albany, New York— Hotel TBD
Contact: NCWM **P.** 402.434.4880
E. info@ncwm.net **W.** www.ncwm.net

September

SEP 22-26

Western Annual Meeting (WWMA)
Kalispell, Montana — Hotel TBD
Contact: Tim Lloyd **P.** 406.443.3289
E. tlloyd@mt.gov **W.** www.wwma.org

October

OCT 4-5

NTEP Measuring Sector Meeting
Charleston, West Virginia — Embassy Suites Charleston
Contact: NCWM **P.** 402.434.4880
E. info@ncwm.net **W.** www.ncwm.net

OCT 7-9

Southern Annual Meeting (SWMA)
Charleston, West Virginia —Embassy Suites Charleston
Contact: Richard McComas **P.** 304.722.0602
E. rich.d.mccomas@wv.gov **W.** www.swma.org

OCT 16-17

North Eastern Interim Meeting (NEWMA)
Norwich, Connecticut — Holiday Inn Norwich
Contact: James Cassidy **P.** 617.349.6133
E. jcassidy@cambridgema.gov **W.** www.newma.us