



NCWM – NEWS

National Conference on Weights and Measures

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Chairman's Column

Stephen Benjamin — North Carolina Department of Agriculture
and Consumer Services



On the Path to Tomorrow

Hello Everyone! We had a great meeting in Portland, Maine and the weather cooperated while we were there; at least it was a little cooler than home.

First of all I would like to congratulate our newly elected officers to the Board of Directors:

John Gaccione – Chairman-Elect, Westchester County, New York Weights and Measures

Jerry Buendel – Western Regional Director, Washington State Department of Agriculture

Steve Giguere – At-Large Director, Maine Department of Agriculture

Mark Coyne – Treasurer, City of Brockton Massachusetts Weights and Measures

I look forward to working with all of them this coming year as we continue to work to improve both the NCWM as an organization and the services available to our membership.

I am excited about our theme this year, "On the Path to Tomorrow". When I think about it, we have been on that path for some time, with VCAP and the Professional Certification programs coming immediately to mind. While both of these took some time to develop and launch, they now seem to be picking up some momentum as we continue to add to them. Having been on the Board for several years, I am well aware of a number of projects that we feel would benefit the conference and we may be getting to the point of "having too many irons in the fire". I hope to see some of these completed or at least well underway by the time we meet in Louisville, KY next July.

One project has been mentioned a number of times over the last year; the "tool kit" for regulatory programs. I would like to note that the AMC is very supportive of this idea and eager to participate. The intent is to have information, statistics, contacts, videos and other resources available to jurisdictions to help them address a number of needs. Many programs have faced huge budget cuts or elimination, often having to respond to legislators about their programs. They may find letters of industry support, statistics or even case stories from other jurisdictions helpful.

I see the tool kit as more than just useful when you're in trouble. There need to be several messages available to you. It could be a generic video to make people aware of how weights and measures programs touch their lives every day, along with a version tailored more towards a legislative audience. I think there have been a number of questions on the director's list server lately that would be helpful. While that information will become out dated at some point, you would know who to contact for an update. Kurt Floren is still committed to collecting information from programs that may also find a place in the tool kit.

As with many big projects, getting started has been difficult – especially where to start. What we need to know is what do you need or want to see in the tool box? I would also encourage you to respond to requests for information, surveys, etc that will be used to stock our tool box. Feel free to contact me at steve.benjamin@ncagr.gov, your regional representative or Don Onwiler with your thoughts. I plan to form a work group for this item and welcome additional ideas.

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Mixing & Matching Main Elements of a Scale

How to Determine Compliance - Part 1

In the last article (2012 Issue 2) we looked at the different main elements of a scale and NTEP certificates for those main elements. We reviewed NIST Handbook 44 (HB44) 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 Certificate of Conformance (CC) had been issued. We left off with H44 marking requirements specified in Scales Code Tables S.6.3.a. and S.6.3.b. for main elements of a scale and the importance of initial verification when a field inspector must determine if the elements are interfaced together properly to comply with HB44 requirements.

To help the inspector with the determination of compliance when separate main elements are married together, worksheets were developed back in the mid 1980's, one for Class III scales and one for Class IIIL scales. So the worksheets are not new, in fact I remember NIST releasing the worksheets at least twice through newsletters. NCWM is now working to post blank worksheets for downloading and use and example completed worksheets on the NCWM website to aid the W&M community. Some states report that they require their registered service personnel to complete a worksheet when a new Class IIIL system is installed for use in their jurisdiction. This column takes us through the completion of a worksheet for a Class IIIL electromechanical vehicle scale. As one would expect, NTEP evaluators must also verify compliance with Handbook 44 marking requirements and the compliance of separate main elements to other Handbook 44 requirements when systems and main elements are evaluated. The example worksheet

(found on page 8) used with this column is an actual scale system evaluated by the Maryland NTEP Laboratory.

The NIST Handbook 44 definition of a weighing element is "that portion of a scale that supports the load-receiving element and transmits to the indicating element a signal or force resulting from the load applied to the load-receiving element." NIST Handbook 44 defines the load-receiving element as "that element of the scale that is designed to receive the load to be weighed; for example, platform, deck, rail, hopper, platter, scoop." So, when we use the term weighing and load-receiving element we mean the combination of the weighing element and the load receiver, such as the weighbridge and deck of a vehicle scale.

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 nmax should be marked on all three main elements. However, please be advised 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 emin. Additional information required for the load cell include: vmin and single (S) or multiple (M) cell certification by NTEP. Now we can certainly understand the intent of HB44 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. HB44 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 HB44, Scales Code, Paragraph N.1.3.3.2., which includes an excellent illustration of a three section platform scale.]

- Box 44 requires us to determine how many load cells are utilized in the scale being inspected. [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.]



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- Box 45 requires the recording of the scale multiple. This information is only applicable to mechanical lever system weighing elements when used with a load cell in an electro-mechanical system installation and is not required to be marked. It will likely be necessary to obtain this information from the manufacturer of the weighing element or the installing agency. [Technical note: See the HB44 definition for "multiple of a scale" and Scales Code paragraph S.5.4.]

Now that we have completed all the 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 emin value marked on the weighing element [Box 32] with the division size for which the system under inspection is set-up [Box 16]. The emin 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 Box 9 of the worksheet.

- Question 2 requires us to look at the nmax 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 nmax 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 nmax 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 nmax values for the main elements were not the same. Suppose we had nmax 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 HB44, 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 450 000 lb, so it meets the requirement.

- Questions 4 and 5 require a determination of the appropriate relationship of the load cell verification value (vmin) to the scale division. The requirement is traceable to HB44, Scales Code, paragraph S.5.4.

Continued on page 10

2012 Lifetime Achievement Award

Tom Geiler - Barnstable, MA



Left to Right - Kurt Floren, Tom Geiler, Dr. Willy May

Tom Geiler began his career as a meat cutter and then as a meat department manager for 15 years. During this same time, he was also a reserve police officer for his community; a position he would hold for 35 years. In 1974, he took the experience he gained in law enforcement and retail, and applied it to a new line of work as Weights and Measures Sealer in Barnstable, Massachusetts. He still holds that position 38 years later.

Tom has attended 35 consecutive NCWM Annual Meetings. More important is his tireless service on many committees, subcommittees and task groups that were integral to the success of NCWM in its mission. Tom was NCWM Chairman in 1994 but did not use that achievement as an excuse to step aside from continued leadership roles.

This man has been a leader at all levels of weights and measures enforcement, never seeking personal reward but always demonstrating concern for consensus and integrity in his arguments to advance the philosophy of Equity in the Marketplace. His service records to his state and regional associations are equally impressive. In addition to those associations, he is also affiliated with the International Society of Weighing and Measuring, International Society of Antique Scale Collectors, New England Parking Officials, Massachusetts Parking Officials Association, Massachusetts Licensing Officials Association, and if that isn't enough, he has probably attended more Western Weights and Measures Association meetings than any one who lives in the western region.

NCWM is proud to recognize Tom Geiler and to say "Thank you!" for your past and continued dedication to equity in the marketplace.

Other Awards Distinguished Service Award



Tina Butcher: NIST Office of Weights & Measures



Chris Guay: Procter and Gamble



Charles Carroll: Massachusetts Division of Standards



Ron Hayes: Missouri Department of Agriculture

Contributions Award



Tim Tyson: Kansas Department of Agriculture

Please visit the NCWM Website for more detail about these award recipients at:
<http://www.ncwm.net/content/2012-ncwm-annual-meeting>

Working in Confined Spaces

Twenty-five years ago it was a spring ritual for some state weigh station operators to gather together and clean a winter's worth of debris from the vehicle scale pits. Several workers would squeeze through the manhole and form a bucket brigade to move the mud closer to the holes where others would then pull the buckets up and dump them for haul-off.

Neither the workers nor management thought this was a particularly dangerous activity until the year that a truck carrying acid leaked onto the scale. Even after professional cleaning inside and out, there were still enough residual fumes to overcome the first employee entering the pit, resulting in a rescue situation.

This is a classic example of a hazardous environment made dangerous by not following safety procedures. The scale pits still need to be cleaned but as workers and managers, we must ensure that safety plans are in place and precautions are used to get the job done without injury or death.

Many people do not associate Weights & Measures inspections with confined space hazards but in fact many inspectors, especially those performing heavy capacity scale tests, are routinely working in industrial areas with entrapment or confinement potential. Occupational Safety and Health Administration publication OSHA 3138-01R 2004, available at www.osha.gov describes two distinct categories:

Confined space is an area large enough for an employee to enter fully, which is not designed for continuous occupancy and has limited or restricted entry or exit. This description would include anytime you are in a vaulted vehicle scale, under an above-ground scale or where you are placed between the scale and a diked area adjacent to the scale. Temporary vehicle scale installations that are built in pits with inwardly converging

walls can also be considered confined space and appropriate safety cautions must be taken. Grain silos, industrial weigh-hoppers or other devices in production areas should be evaluated for confined space criteria.

Permit required confined space is defined separately and only has to meet one of the following characteristics:

Contains or has the potential to have a hazardous atmosphere such as vaulted scales in suspect geographical areas where underground gasses are known to exist (landfill scales). It is also common for an inspector to enter a permit-required space when testing scales in an oxygen/acetylene plant.

Contains a material with the potential to engulf someone in the space; grain or aggregate hoppers first come to mind but actually testing in a goose down factory could also meet this criteria.

Space with an internal configuration that has sloping walls or floor, tapering to a smaller cross section which could trap or asphyxiate. Almost all weigh hoppers meet this definition whether they are tank or open air style.

A space with any other recognized serious safety or health hazards. This is a catch-all definition to describe other areas where it is necessary for health and safety issues, to limit access to authorized entrants only.

Since 1970, OSHA has encouraged states to implement their own job safety plans which are approved and monitored through regional OSHA offices. This article is meant to alert everyone to the hazards of confined space and spur a review of your individual safety plans.

— Douglas Deiman
Alaska Division of Measurement Standards/CVE

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- Category A & B Sampling Plans
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- Allow variations due to moisture loss
- Calculates SEL and Standard Deviation
- Dynamically calculates Rc/Rt for tare
- Calculates conversion factors for volume inspections
- Calculates Cost Error, Average Error, Average Cost Error % Error



Device Inspection

WinWam Device Inspection Software is designed to perform and record Handbook 44 inspections. WinWam Device Inspection Software supports all devices specified in Handbook 44 including but not limited to: scales, (apothecary, computing, livestock, shipping, vehicles, etc.) meters, LP Gas, LMD, linear devices, timing devices, etc. Whether acceptance or maintenance WinWam calculates tolerances for nearly all tests.

WinWam Device Inspection Software provides a comprehensive database of business establishments with a complete inventory of devices. Full detail inspection data allows management the ability to better measure economic impact of the W&M program.

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NTEP Worksheet - Class III L

National Conference on Weights and Measures / National Type Evaluation Program
NTEP Worksheet – Class III L



Company: Webster ScaleLocation: Webster, SDDate: May 2012

Information found on the device identification plate, badge or display.	MARKINGS	INDICATING ELEMENT		WEIGHING ELEMENT		LOAD CELL(S)	
	Manufacturer	1	Rice Lake Weighing Systems	2	Webster Scale	3	Rice Lake Weighing Systems
	Model	4	920i	5	PV7050511	6	RL20000B (1000 lb)
	Serial Number	7	112345	8	W54321	9	LC78910
	Class III, III/III L, III L	10	III/IIIL	11	IIIL	12	IIIL
	Capacity	13	200 000 lb	14	200 000 lb	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	0.04 lb
	"CLC" Concentrated Load Capacity (vehicle scale only)	25	100 000	26	100 000 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	01-088A5	35	12-059	36	98-044A1
	"n _{max} " Maximum Number of "d"	37	10 000	38	10 000	39	10 000
Info from Site	Single Cell (S) or Multiple Cells (M)	40	NA	41	NA	42	S
	Number of Sections	43	5	Number of Load Cells "N"	44	1	
	*NOTE: If the weighing element is a lever system, enter the lever (scale) multiple here:						45

Suitability Criteria							
1	e _{min} ≤ d					Meets Requirements	
	Enter # from Box 32		Enter # from Box 16			Yes	No
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	100 000 x 4.5 = 450 000 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		≤	53				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	0.04 lb	≤	55	20 ÷ 280 (280 x 1) = 0.071 lb		x	

NCWM Welcomes New Members (5/8/12 - 9/20/12)

- AgTrax Technologies
Gary Hobbs
API
Shane Skelton
AZ Department of Weights & Measures
Michelle Wilson
AK Oil Marketers
Steve Ferren
Auglaize County Weights & Measures
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NTEP Continued...

Continued from page 3

Notice that we only need to answer one of the suitability criteria questions 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 an electro-mechanical system and question 4 is not applicable. Question 5 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 x the scale multiple. As a formula, this can be stated as $v_{min} < d \div (\sqrt{N} \times \text{scale multiple})$. So we look at the value in Box 24 (0.04 lb) and make sure it is less than or equal to Box 16 (20 lb) \div the square root of Box 44 (the square root of 1 is 1) x value in Box 45 (280: 1 is 280). When we plug those numbers into the formula it results in $0.04 \text{ lb} < 0.071 \text{ lb}$, so the load cell complies with the requirement.

As we can see, 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. Upcoming newsletter articles will provide worksheet examples of a Class III fully electronic scale and a Class III hopper scale. If you would like to discuss the content of this column contact Jim Truex at jim.truex@ncwm.net.

— Jim Truex, NTEP Administrator

On the Path to Tomorrow Continued...

Continued from page 1

By the way - North Carolina will be hosting a NIST training session in December on HB 133 – Checking the Net Content of Pack-aged Goods. It will be held in Raleigh Dec. 10-14. As I write this there were seven seats available. Contact Yvonne Branden with NIST (301) 975-3272 or use their online registration at <https://tsapps.nist.gov/WMD>. It does get cold here, but any snow or ice is usually in late January or February.

Stephen Benjamin

- Steve Benjamin, NCWM Chairman

97th Annual Meeting - Portland, Maine July 15-19, 2012



NTEP Certified Liquid Controls Positive Displacement Meters and Sponsler Turbine Meters

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105 Albrecht Dr.
Lake Bluff, IL 60044
T - 800.452.5262
F - 847.295.1057
www.lcmeter.com

LIQUID CONTROLS POSITIVE DISPLACEMENT METERS

1 1/2 to 6"
6 to 800 GPM
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solvents
*Contact LC for sizes





National Conference on Weights and Measures

1135 M Street, Suite 110 / Lincoln, Nebraska 68508

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Event Calendar

October 2012

Southern Annual Meeting (SWMA) October 7-10, 2012

Louisville, Kentucky — Location: Galt House Hotel

Contact: Jason Glass P. 502.573.0282

E. jason.glass@ky.gov W. www.swma.org

Northeastern Interim Meeting (NEWMA) October 16-17, 2012

Springfield, Massachusetts — Sheraton Springfield Monarch Place Hotel

Contact: James Cassidy P. 617.349.6133

E. jcassidy@cambridgema.gov W. www.newma.us

NIST Administrators Workshop October 22-26, 2012

Gaithersburg, MD — Location: NIST

Contact: Carol Hockert P. 301.975.5507

E. Carol.Hockert@nist.gov W. www.nist.gov

December 2012

NIST Administrators Workshop December 3-7, 2012

Gaithersburg, MD — Location: NIST

Contact: Carol Hockert P. 301.975.5507

E. Carol.Hockert@nist.gov W. www.nist.gov

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

January 2013

NCWM Interim Meeting January 27-30, 2013

Charleston, SC — Francis Marion Hotel

Contact NCWM P. 402.434.4880

E. info@ncwm.net W. www.ncwm.net

March 2013

Weights and Measures Week March 1-7, 2013

Contact NCWM P. 402.434.4880

E. info@ncwm.net W. www.ncwm.net

NTEP VCAP NOTICE

NCWM is working to identify all active certificates for weighing elements 2000 lb capacity and less, using non-NTEP load cells. As a courtesy, certificate holders are being notified of VCAP requirements and the established time line. Please note that the NCWM Board of Director's does not consider it to be NCWM's responsibility to identify all certificate holders and affected certificates. Certificate holders are responsible for reviewing their active NTEP certificates and compliance with VCAP.

