

# Report of the Professional Development Committee (PDC)

Agatha Shields, Chairman  
 Franklin County Weights and Measures  
 Columbus, Ohio

Reference  
 Key Number

**400 INTRODUCTION**

This is the report of the Professional Development Committee (hereinafter referred to as the “Committee” or PDC) for the 93<sup>rd</sup> Annual Meeting of the National Conference on Weights and Measures (NCWM). This report is based on the Interim Report offered in NCWM Publication 16, testimony heard at public hearings, comments received from the regional weights and measures associations and other parties, the addendum sheets issued at the Annual Meeting, and actions taken by the membership at the voting session of the Annual Meeting. The informational items presented below were adopted as presented when the Committee’s report was approved.

Table A identifies the agenda items in the Report by Reference Key Number, Item Title, and Page Number. Item numbers are those assigned in the Interim Meeting agenda. A voting item is indicated with a “V” after the item number. An item marked with an “I” after the reference key number is an information item. An item marked with a “D” after the reference key number is a developing item. The developing designation indicates an item has merit; however, the item was returned to the submitter for further development before any action can be taken at the national level. Table B lists the appendices to the report.

**Table A  
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**Table C  
Voting Results**

<i>Reference Key Number</i>	<i>House of State Representatives</i>		<i>House of Delegates</i>		<i>Results</i>
	<i>Yeas</i>	<i>Nays</i>	<i>Yeas</i>	<i>Nays</i>	
400 (Report in its Entirety Voice Vote)	0	0	0	0	Passed

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

**401 EDUCATION**

**401-1 I National Training Program (NTP)**

**Source:** Carryover Item 401-1 (This item originated from the Committee and first appeared on its agenda in 2003.)

**Background:** For complete background information, see the PDC page of the NCWM website, <http://www.ncwm.net/members>.

The Committee’s overall strategic direction is summarized in Appendix A.

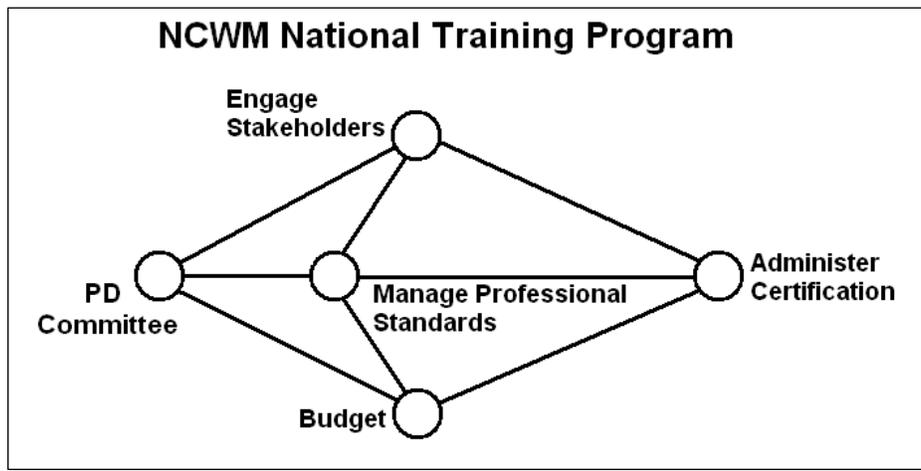
**Discussion:** The PDC encourages each regional association to dedicate a portion of their Annual Meeting to the National Training Program (NTP).

During the 2008 Interim Meeting, the Committee discussed the WWMA’s suggestion to establish an action plan and timeline. The Committee has developed an NTP, Critical Component Analysis, which is an action plan of the components of the NTP. The Committee presents a draft of this document below.

**National Conference on Weights and Measures  
National Training Program  
Critical Component Analysis  
DRAFT, February 21, 2008**

The Committee has begun a comprehensive effort to identify critical resources and tasks necessary for the project, and the logical sequence in which those tasks must be performed, including the possible use of parallel activities.

Critical path analysis techniques were developed to manage complex projects just like the National Training Program. The Committee is planning to use those techniques to the extent possible to plan our future activities as we work toward a certification program.

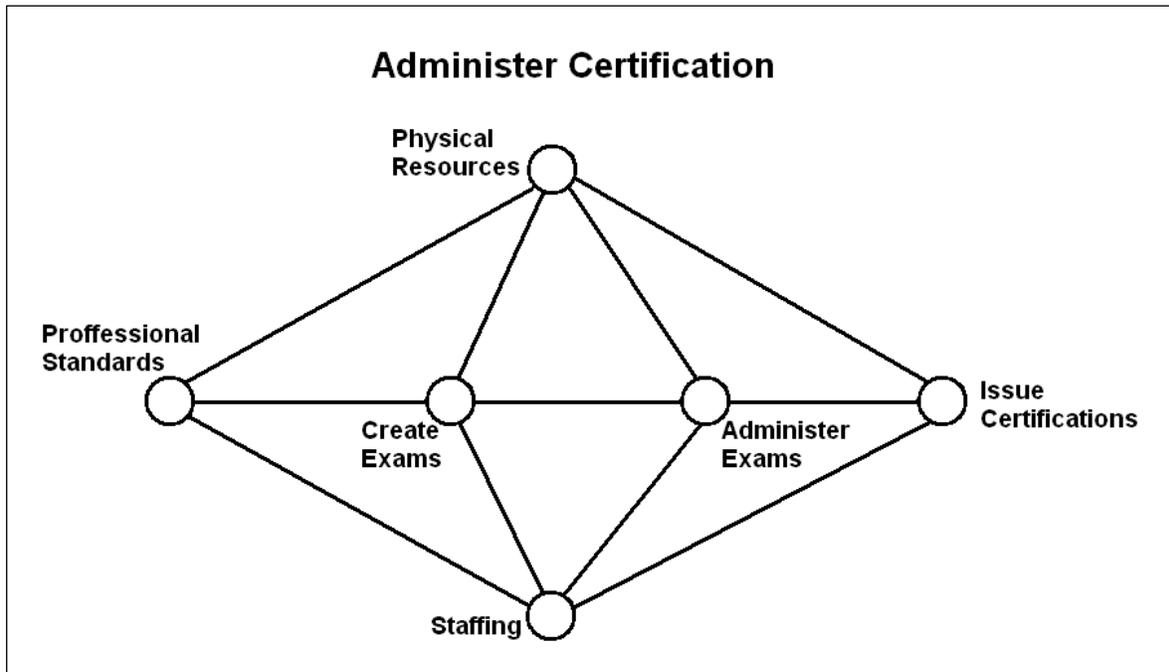


The Committee sees its task as one of managing four critical elements that come together as a certification program as depicted above. Each bubble in the figure represents a milestone that must be reached in order to complete the objective. Those four main elements are:

**Budget** – involves tasks to secure necessary funding from the Board and other sources to undertake and complete all the other tasks.

**Engage Stakeholders** – involves tasks necessary to identify stakeholders and the resources they can bring to the project, encourage them to participate at all levels, and particularly to incorporate the professional standards in their training programs and to eventually take part in the certification program. It should be noted that the stakeholders will be the ones doing the training and not the NCWM. The NCWM will only be coordinating the professional standards and administering the certifications.

**Manage Professional Standards** – involves tasks necessary to create and manage a set of standards for the profession. The Committee has identified the professional standards, the first task that must be completed. The completion of the curriculum plan, the curriculum template and the guide to preparing curriculum segments and the guide to preparing test questions are some of those important steps. The work groups are now finalizing the first seven curriculum segments and corresponding test questions. This is a great start and there still is a significant amount of additional work necessary in this area.



**Administer Certification** – involves tasks necessary to create certification exams, administer those exams, and issue certifications to those who qualify. The Committee will manage staffing, both paid and volunteer, and physical resources to secure the exams and record and issue the certificates.

As the necessary curriculum segments are completed and test questions prepared, we may begin to embark on some of the steps toward certification. Over the coming months, the Committee will continue to elaborate on the details in this project and keep refining it as we move forward.

#### 401-2 I Create a Curriculum Plan

**Source:** Carryover Item 401-2 (This item originated from the Committee and first appeared on its agenda in 2003.)

**Background:** For complete background information, see the PDC page of the NCWM website <http://www.ncwm.net/members>.

**Discussion:** Prior to the 2007 Annual Meeting, the Committee reviewed the curriculum segments submitted by the following regions:

- SWMA, Class III and III L scales;
- WWMA, Retail Motor-fuel Dispensers;
- and NEWMA, Small Scales.

At the 2007 Annual Meeting, the Committee decided, based on comments from several of the regions and its own assessment, it was essential to have a standardized format to ensure uniformity. Based on a collective review of curriculum plans received, the Committee created a sample template and example for regions to use in developing other curricula. The Committee updated its curriculum (Curriculum Package) to include the NCWM Core Competency Model (Appendix C), which provides a model for improving the quality of education in a select discipline. The Committee included this information as a general guideline for the regions to use as they develop other curriculum topics. In addition, the Committee revisited the original “National Training Curriculum Outline” from its 2004 NCWM Annual Report (Final Report). The Committee prepared an accompanying “NCWM

Curriculum Work Plan,” which is intended to assist in the management of curriculum development; this item is included in Appendix H. The Committee also revised the original curriculum outline to match the Work Plan.

The Committee updated the Curriculum Package, and it is included in the following Appendices:

- Cover Memorandum (guide to curriculum development) Appendix B
- NCWM Core Competency Model Appendix C
- NCWM Curriculum Template (curriculum guideline) Appendix D
- NCWM Sample Curriculum (examples of desired format) Appendix E
- Guide for Writing Test Questions (including examples) Appendix F
- National Training Curriculum Outline Appendix G
- NCWM Curriculum Work Plan Appendix H

The Committee has received the following curriculum drafts:

- 4.2 NIST Handbook 44 – Introduction to Device Control;
- 4.3.1 Static Electronic Weighing Systems, General;
- 4.3.5 Small Capacity Weighing Systems, Class III;
- 4.3.7 Vehicle Class III or III L;
- 4.4.1 Retail Motor Fuel Dispensers; and
- 5.3.1 Commodities, General

The Committee will return to the curriculum drafts received, along with the newly revised curriculum package to the development team in each region to make revisions based on the Committee’s recommendations.

The Committee will also be requesting that each region set aside time for a presentation of the new Curriculum Package at their upcoming Annual or Interim Meeting. In addition, the Committee is requesting volunteers develop additional segments. The Committee acknowledges that the CWMA volunteered to sponsor the first training session on the use of the completed curriculum.

#### **401-3 D Instructor Improvement**

**Source:** Carryover Item 401-3 (This item originated from the Committee and first appeared on its agenda in 2003.)

**Background:** For complete background information, see the PDC page of the NCWM website <http://www.ncwm.net/members>.

Industry has continued to support and sponsor training on their new technology for weighing and measuring devices. NIST has assured the Committee they will continue their work towards providing technical training for the trainers.

**Discussion:** The Committee supports the recommendation from the WWMA to encourage jurisdictions to participate in the NIST, WMD Instructor Training program as those classes become available.

#### **401-4 D Certification**

**Source:** Carryover Item 401-4 (This item originated from the Committee and first appeared on its agenda in 2003.)

**Background:** For complete background information, please see the PDC page of the NCWM website <http://www.ncwm.net/members>.

Subsequent to the 2006 NCWM Annual Meeting, all states not previously contacted were sent a letter requesting the name of their State Certification Coordinator (SCC). The state director becomes the default SCC in the absence of a designated contact. The SCC contact list is posted on the PDC page of the NCWM website (<http://www.ncwm.net/members>).

**Discussion:** The Committee continues to hear support from the regions concerning the establishment of a certification program.

The Committee has contacted the SCC of each state to gather information on its current training and certification programs. The Committee will be reviewing the Model Professional Development Training and Certification Standards Statute for Inspectors and Sealers of Weights and Measures (Appendix I) that was submitted by NEWMA. The Committee will study the sample with the possibility that it might ultimately be used to establish model criteria for a certification program.

The Committee has included a Guide for Developing Test Questions (Appendix F) in the curriculum package referenced in Item 401-2. At the 2008 Interim Meeting, the Committee brought forth two options for building the bank of questions for certification. The first option was to build one large bank of questions developed for use in training and during the certification exam. The second option would be to develop two banks of questions using one bank of questions for training and the second bank of questions, which would be protected, for certification only.

Recommendations during the open hearing included having jurisdictions take the lead on developing the questions, administering the examination, and grading. The NCWM would issue certificates based on the jurisdictions' reported results.

Pursuant to the recommendations from the WWMA and the CWMA, the Committee is in the process of developing the infrastructure of the program. The Committee believes that a model is necessary to determine what the program will look like and what the roles of the states and NCWM should be.

#### **401-5 D Recommended Topics for Conference Training**

**Source:** Carryover Item 401-5 (This item originated from the Committee and first appeared on its agenda in 2003.)

**Background:** The Board has charged the Committee with responsibility for selecting appropriate topics for the technical sessions at future Annual Meetings. The Board asked that the Committee review and prioritize possible presentations and submit those to the Chairman. The Chairman would then work with NCWM staff to make the arrangements and schedule the sessions.

The Committee continues to carry the following list and recommends these topics for possible training seminars, roundtables, or symposia for presentation at the NCWM meetings:

- (a) Risk-based Inspections (Robert Williams, Tennessee, volunteered to present his state's Retain Motor-Fuel Device (RMFD) testing program);
- (b) Marketplace Surveys;
- (c) Auditing the Performance of Field Staff (Will Wothlie, Maryland, volunteered to lead the session);
- (d) Alternative Fuels (including motor-fuel trends and technology updates);
- (e) Device Inspections Using a Sampling Model;
- (f) Emerging Issues;
- (g) Proper Lifting Techniques (recommended by Ken Deitzer, Pennsylvania);
- (h) Overview of OIML and its Relationship to Standards Development (recommended by Julie Quinn, Minnesota);
- (i) Back and Stress Techniques (recommended by Don Onwiler);
- (j) Public Relations, specifically dealing with aggressive/angry people (recommended by the SWMA);
- (k) Inspector Investigative Procedures (recommended by the SWMA);
- (l) General Safety Issues (recommended by the WWMA);
- (m) Defensive Driving (recommended by the WWMA);
- (n) Administrative Civil Penalty Process (recommended by the WWMA);
- (o) Price Verification (recommended by the WWMA);
- (p) Customer Service (recommended by the WWMA);
- (q) Ethics (recommended by the CWMA);
- (r) Automatic Temperature Compensation (ATC) testing for field inspectors;

- (s) Hydrogen Measuring Systems; and
- (t) OSHA Safety.

For the 2008 NCWM Annual Meeting Technical Education Sessions, the Committee recommends Automatic Temperature Compensation (ATC) testing for field inspectors and OSHA Safety.

**402 PROGRAM MANAGEMENT**

**402-1 I Safety Awareness**

**Source:** Carryover Item 402-1 (This item originated from the Committee and first appeared on its agenda in 2003.)

**Background:** In the past, the Committee’s responsibility extended to the identification of safety issues in the weights and measures field and included efforts to increase safety awareness.

At the 2005 Annual Meeting, Past-Chairman Dennis Ehrhart recommended the committee make training its highest priority. The Voluntary Quality Assurance Assessment program, NCWM Associate Membership Scholarships, and safety awareness efforts were carryover items from the Committee on Administration and Public Affairs (A&P) and not PDC items.

Jurisdictions should send their safety reports and issues to their regional safety liaison, who in turn will forward them to Charles Gardner, the NCWM Safety Coordinator. Charles recommends the reports or report summaries be published in the NCWM newsletter. At the 2005 Interim Meeting, a CD-ROM on safety produced for the U.S. Environmental Protection Agency was made available for review. The Committee believes safety awareness should be a part of every aspect of training for NCWM stakeholders. The regional safety liaisons are listed below.

- SWMA Steve Hadders, Florida Department of Agriculture & Consumer Services
- WWMA Dennis Ehrhart, Arizona Department of Weights & Measures
- CWMA Agatha Shields, Franklin County Weights & Measures
- NEWMA Michael Sikula, New York Bureau of Weights & Measures

At the 2007 Interim Meeting, the Committee decided to reach out to the regional safety liaisons and ask that they write newsletter articles designed to raise safety awareness and provide safety tips to the weights and measures community. These archived articles are on the PDC page of the NCWM website. The NCWM newsletter is published three times a year and all articles should be e-mailed to the NCWM headquarters office, at ncwm@mgmtsol.com, by the deadline dates listed below. (**Note:** The NCWM e-mail address will change after October 1, 2008, to info@ncwm.net.)

Association	Issue	Article Deadline
WWMA	2008, Issue 2	March 15, 2008
CWMA	2008, Issue 3	July 15, 2008
NEWMA	2009, Issue 1	November 15, 2008
SWMA	2009, Issue 2	March 15, 2009

**Discussion:**

**Southern Weights & Measures Association (SWMA):** The SWMA PDC received a report involving static electricity while using a three 5 gal unit to return retail motor fuel to storage. An inspector pulled the delivery hose from a PVC storage tube, inserted the hose into the area of the return storage tank, and a flash fire from the static electricity occurred. The hose and the top of the return were on fire.

The SWMA PDC recommends the following:

1. replacing the PVC storage tubes with aluminum tubes;
2. drilling several holes in the aluminum tube to vent the hose and tube;

3. connecting the delivery hose to the truck to ensure grounding before approaching the storage tank;
4. holding annual safety meetings with staff to review safety and testing procedures;
5. hands-on fire extinguisher training for inspectors with a fire marshal present; and
6. eliminating all plastic materials (buckets, funnels) in fuel inspections.

The SWMA PDC also received a report about a ruptured hose accident that occurred during a Liquefied Petroleum Gas (LPG) inspection. A company representative was present to help the inspector properly handle the safety issues.

The SWMA PDC recommends the following:

1. An attendant, company representative, or two people should be present during the testing of LPG, home heating oil, rack meters, and terminal meters for operational purposes.
2. Safety and test procedures should be reviewed at annual staff meetings.

The SWMA PDC encourages state and local programs to report safety incidents to Steve Hadder, the safety liaison, immediately so this information can be distributed to other agencies. Steve's contact information is as follows:

Steve Hadder	Office: (850) 487-2634
Division of Standards	Fax: (850) 922-6655
3125 Conner Boulevard	E-mail: hadders@doacs.state.fl.us
Field Operations, Bldg. 1	
Tallahassee, FL 32399-1650	

#### **402-2 D PDC Publication**

As reported in Item 402-3 of the Committee's 2007 Annual Report, the PDC also maintains a PDC document archive on the "members only" PDC page of the NCWM website at <http://www.ncwm.net/members>. This archive is intended to enable NCWM members to follow the history and work of the PDC. The website will continue to be updated as new documents are developed. The following listed documents are currently archived on the PDC page of the NCWM website for easy access and downloading as needed.

History of the PDC  
Formal Scope of the PDC  
NCWM Board of Directors Charge to the PDC  
The PDC's Role in the NCWM Strategic Plan  
The PDC's Strategic Plan  
National Training Curriculum Outline  
Suggested Topics for the NCWM Annual Conference  
Standard Categories of Weighing and Measuring Devices (Adopted by the 92<sup>nd</sup> NCWM, July 2007)  
Safety Liaison Contact Information  
List of State Certification Coordinators and Contacts  
NCWM Issued Certification Program  
Voluntary Quality Assurance Assessment Program  
Curriculum Package (Guide for Creating a Curriculum)

This item will be removed from the PDC agenda following the 2008 Annual Meeting.

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Agatha Shields, Chair, Franklin County, Ohio  
Ross Andersen, New York  
John Sullivan, Mississippi  
Stacy Carlsen, Marin County, California  
Tina Butcher, NIST, Weights and Measures Division  
Charles Gardner, New York, Safety Liaison  
Linda Bernetich, NCWM Staff Liaison

**Professional Development Committee**

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## Appendix A

### Strategic Direction for the Professional Development Committee

The Committee developed its strategic direction to define its roles and responsibilities to the NCWM and the weights and measures community. The Committee members wrote principles to guide them in their deliberations and defined four main areas to focus their efforts. The Committee recognizes that its direction and responsibilities may be changed by the Board of Directors.

The guiding principles of the group are:

- Keep things simple;
- Develop programs that are realistic and achievable;
- Minimize redundancy and administrative tasks;
- Recognize that no one size fits all; and
- Meet the needs of weights and measures officials, service companies, industry, and manufacturers.

The four main areas for focusing their efforts are:

**National Training Program** – The focus of the National Training Program (NTP) is to increase technical knowledge, strengthen credibility, and improve the professionalism of the individual weights and measures official. A strong NTP would promote uniformity across the nation.

**National Certification System** – Develop a national certification system to recognize or accredit weights and measures programs as competent or capable. The program would include requirements around individual training, proper test standards, use of national handbooks, and a data gathering system.

**Conference Training Topics** – The Committee would be the focal point for gathering and recommending workshops or symposia on leadership, management, and emerging issues to be presented during the Annual Meeting. These topics would provide a forum for the exchange of ideas and discussion of changes in the marketplace.

**Uniformity of Data** – The Committee would develop standard categories for devices and inspection areas so that such things as the number of devices, compliance rates, frequency of inspection and other areas could be compiled and compared at the national level. These statistics could be used to benchmark organizations and to communicate the value of weights and measures to the public and to decision makers (see Item 402-4).

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## Appendix B

### Curriculum Package

**National Conference on Weights and Measures  
National Training Program  
COVER MEMORANDUM**

**TO:** Curriculum Development Volunteers  
**FROM:** NCWM Professional Development Committee (PDC)  
**DATE:** October 29, 2007  
**RE:** Development of Basic Level Curriculum

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Thank you for volunteering to work on the curriculum for a Basic Level Inspector. We define “basic” as the competency level required for the inspector to operate without direct supervision. In this work, we are moving to an outcome-based approach for setting educational standards and away from a textbook approach. The outcome approach is widely used in primary and secondary education and in the training of many professionals. Under this model we focus on the outcomes and use these to describe the organization and coverage of the training course. The course materials become a means to an end rather than the end itself. The approach encourages innovation and creativity because it does not limit the trainer to a specific textbook or course presentation. The outcomes and milestones in the curriculum also will directly drive the certification program.

The curriculum lists the outcomes in terms of the specific knowledge and skills we expect the basic inspector to possess at the end of the training. Each outcome will be further defined by a set of milestones, or competencies, that specify the activities and tasks that will be used to measure the student’s mastery of the knowledge and skills (i.e., outcomes). The milestones must specify a single, clear objective, stating what the student will be able to do after the training. Milestones must be measurable and should lead to obvious test questions. Your task is to create the curriculum for a small segment of our profession.

Since many groups will be working on selected pieces of the overall curriculum, the Committee has selected a format for the curriculum materials from the NCWM Core Competency Model based on work of the California Society of Certified Public Accountants (CACPA). In their publication, *The California Core Competency Model for the First Course in Accounting*, they provide a model accounting curriculum, a discussion of their methodology, and the rationale for using that methodology. Before beginning your work, we strongly recommend you read the short introduction to the NCWM Core Competency Model and if you would like a copy of the CACPA, we will be happy to send that to you as well. This common format will ensure that the pieces that get developed mesh together without extensive reformatting and editing.

The Committee is also asking that you review the NCWM Sample Curriculum (Appendix E). These serve as a Weights and Measures example of the format we want to use and were prepared using the CACPA model. These segments also demonstrate the level of detail we want to see in the final product. As in the NCWM Core Competency model document, our goal is to set standards rather than create a “lesson plan.”

Please note the layered approach used in the small scale materials and how this limits redundancy in the curriculum. The first segment on general device inspection should be considered a prerequisite for the second segment on basic scales. Both are prerequisites for the segment on small capacity scales. The first segment is also a prerequisite for any other measuring device area. For some devices, like timing devices, only one layer below this first layer is necessary. For liquid measuring devices, we would expect there to be two layers, a general layer that applies to all dynamic volume measuring and then a number of specific disciplines below that. Above all of these is a much broader segment that will include state and local laws and regulations, administrative procedures, enforcement policies, etc that need not be included with each specific device segment.

Your task will be to identify the outcomes and the milestones that are pertinent to the area of Weights and Measures you chose to work on. We suggest a process that involves the following steps:

1. Brainstorm – Create a bullet list of knowledge and skills expected. Ask simple questions. What should the inspector know? What should the inspector understand? What should the inspector be able to do?
2. Group the bullets to define a broad outcome. For a device segment consider groupings like; technology and terminology, classification and performance standards, markings and operational controls, technical requirements, user requirements, and test procedures. As a guideline, you should aim to have three to eight milestones under each outcome.
3. Create a concise outcome statement for each outcome. See Outcomes and Competencies of the NCWM Core Competency Model document and Appendix E, NCWM Sample Curriculum.
4. Group similar milestones to the extent practical into a broader category. For example, instead of listing expectations for use of zero, tare, units buttons, state a single expectation regarding typical controls on the device and consider listing specific controls parenthetically.
5. Create a milestone statement, i.e. competency, using a verb from the list based on the levels of cognitive learning in Bloom's Taxonomy in Inventory of Concrete Verbs from the NCWM Core Competency Model document. For the basic inspector we recommend you limit your milestones primarily to the first three levels, i.e. knowledge, understanding, and application. The higher levels of learning in Bloom's Taxonomy, analysis, synthesis, and evaluation, typically require practical experience not expected in the basic inspector.

In Bloom's Taxonomy,

- Knowledge refers to the ability to recall facts, terms, and basic concepts.
- Understanding refers to the ability to interpret or explain concepts using your own words.
- Application refers to the ability to put knowledge/understanding to practical use and demonstrate skills required to actually perform specific acts.

As an added challenge to our work groups, we are asking you to draft sample test questions for your milestones. Please note that there is a tendency to focus only on knowledge in the typical multiple-choice question. Please try to also write questions that also evaluate understanding and require application of knowledge. For these you might want to consider putting the candidate in a situation and asking specific questions that require multiple steps to achieve an answer. In these cases fill-in-the-blank format may be superior to multiple choice. In addition to getting the answer, also consider asking the student to cite the specific code reference.

As a curriculum segment draft is completed, the Committee will do a quick review and suggest editing for uniformity of format. When it is ready, we will circulate the draft for review and comment. The critical questions we will ask are: What is missing from this curriculum segment and what should be removed or

moved to another segment in another level? With this review process, we hope to build a consensus of agreement on the standards being set. The same would apply to sample questions.

By using Appendix C, NCWM Competency Guide Model; Appendix D, NCWM Curriculum Template; Appendix E, NCWM Sample Curriculum, it should guide you through writing your curriculum so that the National Training Program will be uniform throughout all the courses. Appendix F, Guide for Developing Test Questions, will guide you through writing ten certification questions on the subject you have chosen.

The Committee greatly appreciates your willingness to contribute to this project. Please send your comments or questions on the project to the current chair Agatha Shields at [aashield@franklincountyohio.gov](mailto:aashield@franklincountyohio.gov) of the PDC committee with a carbon copy to Linda Bernetich at NCWM Inc., [lbernetich@mgmtsol.com](mailto:lbernetich@mgmtsol.com). Ross Andersen has agreed to help with questions about the format and the NCWM Core Competency model. Please contact him at [ross.andersen@agmkt.state.ny.us](mailto:ross.andersen@agmkt.state.ny.us) or by phone at 518-457-3146.

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## **Appendix C**

### **Curriculum Package**

#### **The National Conference on Weights and Measures National Training Program CORE COMPETENCY MODEL**

*October 2007*

The National Conference on Weights and Measures Professional Development Committee is proud to present this NCWM Core Competency Model for use in creating the curriculum for the NCWM National Training Program.

The idea for this model began with a grassroots movement of weights and measures educators who wanted to reverse a deteriorating articulation process for the modules in weights and measures.

The model presented here is the result of efforts of PDC members and has made extensive use of the California Core Competency Model for the First Course in Accounting. That model was developed by the California Society of CPAs' Committee on Accounting Education and was released in July 1995.

The competency-based concept and format for the NCWM curriculum was taken almost verbatim from that work. The hours of time volunteered for this project is an impressive example of professional volunteerism at its best. Even more impressive is the fact that when conflicts arose, committee members searched for creative solutions that would meet the needs of more than one point of view. Clearly, weights and measures educators consistently subordinated their individual views of the course to the greater good—the long-run improvement of education.

If you are a weights and measures educator, you are urged to share this model with your faculty and help improve weights and measures education. We hope this model will help you to facilitate your weights and measures training.

#### **THE MISSION OF THE PROFESSIONAL DEVELOPMENT COMMITTEE**

The mission of this Committee is to improve the quality of education. Since the state jurisdictions are such an integral part of the weights and measures education, our mission is to help prepare an outline for you to use in your endeavors.

#### **ACCOMPLISHING OUR MISSION**

We have accomplished our mission by identifying expected student outcomes and core competencies as a basis for articulation agreements. The diversity of emerging instructional models for weights and measures has made the process of articulation very difficult. To reduce the severity of this problem requires a dramatic change in how course equivalencies between states are measured. It is proposed, therefore, that the basis for articulation agreements shift from the current textbook/topic approach to one that focuses on identifying desirable outcomes students should achieve and core competencies that measure their achievement.

## **GENERAL PHILOSOPHY ABOUT HOW TO USE THIS MODEL**

Identifying outcomes and core competencies is an important step in the process of improving weights and measures education. How training officers help students master these outcomes and competencies and how they simultaneously measure student mastery are equally important tasks.

Our intent is *not* to develop a “statewide lesson plan” for weights and measures. Instead, we want individual states to be creative in implementing the common set of outcomes and core competencies described in this *model*. Moreover, we hope each state program will develop a set of outcomes and special competencies that will reflect the unique perspective of its state and the special needs of its students. Thus, our philosophy encourages diversity. Although we want students to attain the educational objectives of the weights and measures training program, we do not expect them to attain these objectives in a prescribed manner.

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Agatha Shields, Franklin County, Ohio (Chair)  
Kenneth Deitzler, Pennsylvania  
Ross Andersen, New York  
John Sullivan, Mississippi  
Stacy Carlsen, Marin County, California  
Dave Wankowski, Kraft Foods, Inc. (Associate Member Representative)  
Tina Butcher, NIST, Weights and Measures Division  
Linda Bernetich, NCWM Staff Liaison

**Professional Development Committee**

## **MILESTONES FOR IMPLEMENTING COMPETENCY-BASED ARTICULATION**

The intent of the Committee on Accounting Education is to promote the widespread acceptance of essential student outcomes and competencies, while encouraging individual programs to implement these outcomes and competencies in ways that best suit their own students. The following milestones are used to evaluate progress in implementing this competency-based articulation system:

**MILESTONE 1:** Derive expected student outcomes (knowledge and skills).

**MILESTONE 2:** Create core competencies (activities expressed in behavioral terms) that are logically derived from the expected student outcomes.

**MILESTONE 3:** Promote a competency-based articulation approach by conducting workshops for interested faculty on how to implement and assess core competencies.

**MILESTONE 4:** Establish acceptance of a single set of outcomes and core competencies.

## **OUTCOMES AND COMPETENCIES**

### **HOW DO YOU DISTINGUISH AN OUTCOME FROM A COMPETENCY?**

An outcome is “what” you expect your students to achieve, whereas a competency demonstrates “how” your students can achieve that outcome. Think of an outcome as an end and a competency as a means to that end.

*Outcomes are the knowledge and skills recommended. Competencies are the specific activities used to measure a student’s mastery of the knowledge/skills or outcomes.*

The outcome/competency approach is different from the traditional textbook/topic approach to accounting instruction. First, the choice of a textbook no longer dictates the organization and coverage of the course. Instead, the outcomes and competencies become the driver and the textbook becomes the vehicle. A related difference is that the course is driven by an output measure (outcomes/competencies) rather than an input measure (textbook/topics). Finally, students more clearly know the content they are expected to study and the precise activities they must perform on examinations and other forms of evaluation by studying the outcome/competency pairings and working problems that reflect them.

## **CHARACTERISTICS OF WELL-CONSTRUCTED COMPETENCIES**

A well-constructed behavioral learning objective or competency has the following characteristics:

- it expresses one objective;
- it is specific;
- it states what the student will be able to do after the learning experience; and
- it uses a concrete verb to specify the desired activity that must be performed by the student to demonstrate competency.

### INVENTORY OF CONCRETE VERBS DENOTING ACTION TAKEN IN COMPETENCIES

The following suggested verbs are arranged in the six cognitive domains identified in Bloom's Taxonomy.

1. Knowledge		2. Comprehension		3. Application	
arrange	order	classify	record	apply	operate
define	recognize	describe	report	choose	practice
duplicate	relate	discuss	restate	demonstrate	schedule
label	recall	explain	review	dramatize	sketch
list	repeat	express	select	employ	solve
memorize	reproduce	identify	tell	engage	transfer
name		indicate	translate	illustrate	use
		locate		interpret	

4. Analysis		5. Synthesis		6. Evaluation	
analyze	differentiate	arrange	organize	appraise	evaluate
appraise	discriminate	assemble	plan	argue	judge
calculate	distinguish	collect	prepare	assess	predict
categorize	examine	compose	present	attach	rate
compare	experiment	construct	propose	choose	score
contrast	inventory	create	setup	compare	select
convert	question	design	suggest	debate	support
criticize	test	formulate	summarize	defend	value
diagram		justify	write	estimate	
		manage			

The model is a “living document.” It will be re-evaluated annually to consider the evolving content.

## **Appendix D**

### **Curriculum Package**

#### **The National Conference on Weights and Measures National Training Program GUIDE FOR DEVELOPING CURRICULUM SEGMENTS**

Prepared by the NCWM Professional Development Committee  
*First Draft – October 2007*

This guide was prepared to assist those work groups preparing segments for the National Training Program Curriculum. Each curriculum segment represents a small portion of the standards for educating our weights and measures professionals. The Committee is recommending a standard format be used as described below.

The curriculum will cover the broad range of knowledge included in the field of weights and measures. It is organized in a hierarchy of segments ranging from broad topics with general information at level one to narrow topics with highly specific information at level three. These segments will be combined to provide the standards for educating our professionals. It is critical to understand that a curriculum is not a lesson plan for the trainer. Rather it is an organized set of objectives and measurable milestones that can be used to verify that the trainer has covered the subject. Since the curriculum is concerned with outcomes rather than input, the trainer must use the objectives and milestones in preparing the lesson plan for training.

#### **Curriculum Segment Format:**

- Segment Number and Title
- Overview and Scope
- Prerequisite Segments
- Objectives and Competencies

#### **Segment Number and Title**

Obtain these directly from the Curriculum Plan with the numbers and titles assigned by the Professional Development Committee. Please include a revision date under the title.

#### **Overview and Scope**

Provide a brief narrative overview and description of the scope of the segment. This should generally be a short paragraph of only a few of sentences.

#### **Prerequisite Segments**

List the segment number and title of any prerequisite segments that should be mastered before undertaking the material in this segment. Generally, this will remain within one of the four main topic areas in the curriculum. When covering device inspection topics, do not include prerequisite segments Weights and Measures General, Metrology, or Market Practices areas.

#### **Objectives and Competencies**

A curriculum segment will typically have multiple objectives, each with two to perhaps ten measurable competencies, sometimes called milestones. If the number of competencies exceeds ten, it is best to break the objective into two or more objectives.

The objective statement should follow the guidelines in the NCWM Core Competency Model. A given category or area may require more than one objective and associated competencies. Well-constructed objective statements should express a single, specific objective. For consistency, the Committee asks that objectives generally be ordered following the table below. The order is to provide a consistent feel to the curriculum. Depending on the needs of

the particular segment, any one or more categories from this chart may not apply. Following the objective statement add a lead-in to the bulleted competencies such as, “To demonstrate this, the inspector can:”.

The competencies or milestones should represent measurable actions that demonstrate a mastery of one aspect of the objective. For base level inspectors, each competency begins with an action verb from the NCWM Core Competency Model beginning with the cognitive levels of knowledge, understanding, or application. As the curriculum is expanded to journeyman and advanced levels, additional cognitive levels of analysis, integration and evaluation may be added. Please present the competencies in bullets.

Device Segment Category	Purpose
Technology and Terminology	These sections should set standards for knowledge of the technology used in this area of responsibility and understanding of the common terms used to communicate effectively.
Device Operations and Functionality	These sections should set standards for knowledge of metrologically significant operations and features of the items under inspection.
Technical Requirements – Inspection	These sections should set standards for understanding of the technical requirements (specifications) for a device or commodity and for the ability to conduct inspection to verify conformance.
User Requirements – Inspection	These sections should set standards for understanding of the requirements incumbent on a device or commodity user and for the ability to conduct inspection to verify conformance.
Test Methods	These sections should set standards for understanding of the physical test procedures used to verify device or commodity performance and for the ability to conduct these tests.

For assistance in working with this template, please contact the current Chair of the Professional Development Committee. A sample curriculum segment following this template is also available from the Committee.

## **Appendix E**

### **Curriculum Package**

#### **The National Conference on Weights and Measures National Training Program Curriculum**

##### **Segment 3.1.1. Static Electronic Weighing Systems, General** *Revised: October 31, 2007*

###### **Overview**

This segment sets standards for knowledge, understanding, and performance required for inspection and testing of static electronic scales. This segment will cover a wide range of information that is generic and applicable to many different static scale applications.

###### **Prerequisites**

- 3.0. Introduction to Device Control
- 3.0.a Safety Considerations
- 3.1. Weighing Technologies and Terminology, General

###### **Objectives and Competencies**

###### **1. Technology of Weighing Systems**

A weights and measures inspector should understand the method of operation and the primary technologies used in typical electronic weighing systems. To demonstrate this, the inspector can:

- Restate that scales measure the weight of material resulting primarily from the force exerted by gravity on the material on the scale.
- Restate that weight on a scale is a close approximation of the mass of the material on the scale in reference to reference standards used when the device is calibrated; hence, scale units are in units of mass, e.g., lb or kg.
- Describe the basic components of a weighing system: load receiver, load sensor, indicator, and peripherals like printers and computers.
- Describe the principle of operation of strain gage load cell scale technologies from the load sensors, to A to D converters, to computer-based processors, to indicators/printers.
- Explain that the digital division for a typical system is defined by the two zones of uncertainty (break points) at approximately  $+\frac{1}{2}d$  and  $-\frac{1}{2}d$ .
- Restate that digital scale components can be packaged in multiple ways involving separate discrete elements (OIML: modules).
- Define common terms used with regard to electronic weighing systems.

###### **2. Classes, Tolerances and Performance Requirements for Scales with a Class Mark**

A weights and measures inspector should understand the classification system for static scales and be able to apply the performance standards under each class. To demonstrate this, the inspector can:

- Explain how the basic tolerances, repeatability tolerances, agreement requirements, and General Code abnormal performance requirements all work together to specify limits to deviations in scale performance.
- Describe how the concepts of accuracy, repeatability, linearity and hysteresis relate to scale performance.
- Describe the organization of accuracy classes for marked scales as specified in Table 3.
- Explain how scale class is related to typical application in Table 7a in the Scales Code.
- Appraise whether a scale conforms to the class declared by the manufacturer.
- Compute tolerances for any class marked scale as per Table 6 of the Scales Code.

- Illustrate how to find either the acceptance or maintenance tolerance for any load on a scale given the scale class, capacity and division size.
- Illustrate how repeatability requirements apply to static scales.

### 3. Scale Markings and Operations

A weights and measures inspector should understand the various marking requirements applicable to a static scale and demonstrate ability to operate a static scale. To demonstrate this, the inspector can:

- Recognize and interpret required identification markings on a scale as per Table S.6.3.
- Recognize and interpret required markings on the controls, indications and features of a scale.
- Demonstrate how to operate the following functions/operations on a typical scale.
  - Power on/off
  - Zero
  - Tare (both platter and keyboard tare) and Tare Clear – if scale has a tare function
  - Units selector – if scale indicates in more than one unit
- Recognize and interpret the information displayed on a scale, including:
  - Gross, Net, and Tare weight indications
  - Center of Zero, Motion, pricing displays, and others
  - Underload/Overload error conditions

### 4. Technical Requirements

A weights and measures inspector should be able to apply the various technical requirements to a static scale and cite the applicable code reference for a deficiency. To demonstrate this, the inspector can:

- Apply the technical specifications relating to the following scale features/indications and cite the HB 44 Code paragraph.
  - Zero-load indications, zero-setting operations, and automatic zero setting (zero tracking)
  - Digital scale divisions and limit of indication
  - Level indication for portable scales
  - Motion detection requirements – zero, tare, printing, etc.
  - Design requirements for weighing elements
- Interpret the rules for matching weighing elements to indicating elements (modules).

### 5. User Requirements

A weights and measures inspector should be able to apply the various user requirements applicable to a static scale and cite the applicable code reference for a deficiency. To demonstrate this, the inspector can:

- Assess suitability of a class marked scale for a given application, considering design, class, application and typical load in Tables 7a. and 8.
- Evaluate compliance of a scale with scale installation requirements in UR.2.
- Evaluate compliance of a scale with general use requirements in UR.3. (Subsections 3.1., 3.2., 3.3., and 3.5.)
- Evaluate compliance of a scale with maintenance requirements in UR.4.

### 6. Basic Test Procedures

A weights and measures inspector should be able to apply the appropriate performance tests to a static scale and evaluate compliance with the applicable tolerances and performance standards. To demonstrate this, the inspector can:

- Demonstrate how to properly use test weights and care for them when not in use.
- Determine minimum amounts of standards required for testing a given scale.
- Select appropriate test loads for an Increasing Load Test for a given scale, perform the test, and evaluate the test results for compliance with applicable tolerances.
- Select appropriate test loads for a Decreasing Load Test for a given scale, perform the test, and evaluate the test results for compliance with applicable tolerances.
- Select appropriate test loads for a Shift Test (eccentric loading) for a given scale, perform the test, and evaluate the test results for compliance with applicable tolerances and agreement requirements.
- Discuss appropriate times to perform a Discrimination Test or a Repeatability Test.

- Select appropriate test loads for a Discrimination Test for a given scale, perform the test, and evaluate the test results for compliance with the applicable standards.
- Select appropriate test loads for a Repeatability Test for a given scale, perform the test, and evaluate the test results for compliance with applicable tolerances and agreement requirements.

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## Appendix F

### Curriculum Package

#### The National Conference on Weights and Measures National Training Program GUIDE FOR DEVELOPING TEST QUESTIONS

*Prepared by the NCWM Professional Development Committee  
First Draft – January 2007*

This guide was prepared to assist those work groups preparing curriculum materials as they prepare test questions. These test questions will be used both as aids to training delivery and also as a measuring stick in any future certification effort. If the certification program is to have credibility, it is vital that the test questions adequately evaluate that the student has achieved the multiple milestones in each curriculum area.

As you write your questions, please remember that we have set the bar at a level of application, the third in Bloom's Taxonomy. Thus, we expect the trainee will KNOW certain things, UNDERSTAND other things, and be able to APPLY the remainder. We are not looking for higher learning levels in Bloom's Taxonomy for basic inspectors and we will not be testing for analysis, integration, or evaluation.

Testing for Knowledge – A test question for knowledge is usually in the form of a true/false, multiple choice, or fill-in-the-blank question. At this point, the Committee is suggesting that developers focus on multiple choice and fill-in-the-blank questions, such as questions 1 and 2 below. With true/false, the person has a 50-50 chance of guessing and getting the right answer. Please note that at this level the trainee need only demonstrate that he/she knows the information and not necessarily that he/she understands it or can apply it.

**1. Which statement best describes the legal standing of NIST Handbook 44? (Answer: B)**

- A. Handbook 44 is a federal regulation published by the National Institute of Standards and Technology that preempts the states.
- B. Handbook 44 is adopted either by act of the state legislature or through promulgation in regulation by the state.
- C. Handbook 44 is amended each year and all states agree to abide by the actions of the National Conference on Weights and Measures.
- D. Handbook 44 is adopted as part of the administrative policy by order of the state director.

**2. A paragraph beginning with "S." in any of the NIST Handbook 44 Codes is a \_\_\_\_\_.**  
(Answer: Specification)

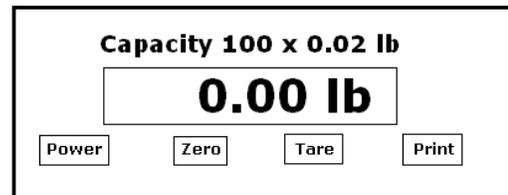
Testing for Understanding – A test question for understanding is usually a multiple-choice question, such as questions 3 and 4 below. Questions concerning understanding often ask the trainee to pick the best response in situations where more than one answer could be correct in some respect. For example, in Question 3, answer B could be a correct answer if the equipment was manufactured after the effective date. Answer C is a better answer since it is more specific and also includes items brought into the state after the effective date. Please note for understanding the trainee needs to demonstrate that he/she knows and understands the information and not necessarily that he/she can apply it.

3. **A nonretroactive requirement is best described by which of the following statements?** (Answer: C)
- A. A nonretroactive requirement is enforceable on all equipment up to the terminal date.
  - B. A nonretroactive requirement is enforceable only on new equipment after the effective date.
  - C. A nonretroactive requirement is enforceable on equipment manufactured after the effective date or brought into the state after the effective date.
  - D. A nonretroactive requirement is enforceable on equipment with an NTEP Certificate granted after the effective date.
4. **Which of the following best describes the difference between “d” and “e” in the Scales Code?** (Answer: D)
- A. The value of “e” is always displayed while “d” may or may not be.
  - B. The value of “d” is always smaller than or equal to “e”.
  - C. The display of values for “d” must always be different in size or character from “e”.
  - D. When “d” does not equal “e”, the tolerances are applied to the value of “e”.

Testing for Application – A test question for application should be either be a multiple-choice question or a “Yes/No with reason” question, such as questions 5 and 6 below. Questions concerning application will usually require the trainee to perform multiple steps to reach the correct answer. In the field, they will not be guided to the correct section of the handbook, but will have to find it based on their knowledge and experience. For example, the question may provide information about the situation and some test results. The trainee must then decide whether to apply maintenance or acceptance tolerances and then evaluate the test results against the appropriate tolerances for that test. In question 5 below, the person must see that the scale is subject to the non-retroactive requirement in Scales Code S.1.7.(b) and then correctly deduce that the only correct response is an overload error. The Yes/No with reason question (question 6) also requires several steps but goes further in that it also requires the trainee to state the nature of any violation and cite the section of the Handbook that is violated. This is critical as this reason and citation would have to be indicated on any official stop-use order issued for the violation. Please note that the trainee needs to demonstrate that he/she knows, understands, and can apply the requirements.

5. **You are inspecting a new price-computing scale (30 x 0.01 lb) in a deli that was placed in service last week. It has an NTEP CC # 99-205. You place a 1 lb weight on the scale and press the tare key. You then place an additional 29.2 lb of test weights on the scale. Which of the following is an acceptable indication for this test load?** (Answer: A)
- A. Overload error
  - B. 29.24 lb
  - C. 29.18 lb
  - D. 29.16 lb

6. **You are inspecting the scale at right and find that it has no zero tracking. With the scale at zero as indicated, you add 0.1 d (0.002 lb) to the platform and the scale indicates a stable 0.02 lb. Is this acceptable?**



Yes or No (No must include reason and citation)

---

Answer: No – The digital zero indication must be maintained accurate within  $\pm \frac{1}{4}$  d of true zero or the scale must have a center zero indicator. Scales Code S.1.1.1.

Initially the Committee is looking to build a bank of test questions that evaluate if the trainee has reached the milestones in each curriculum segment and cover a range of difficulty. Any exam that is prepared will include a mix of questions at each appropriate level in Bloom’s Taxonomy from the curriculum, and varying levels of difficulty from easy to challenging. In that way, the test can be fair yet still differentiate those who really have mastered the discipline from those who haven’t.

After the questions are prepared and tested (testing method to be developed), the Committee would then split the questions into two groups. The first group, called “sample questions,” would be widely circulated for use in training programs. Instructors could use the sample questions in their training or as part of quizzes or final exams to measure effectiveness of the training. Most important, trainees would be exposed to the kinds of questions and the range of difficulty that would be included in a certification exam.

The second group of questions would be secured for use in a certification exam program. The Committee envisions charging some group to administer the certification exam and assist in the grading. That group would also create alternative exams or periodically change the questions so the exam is not the same for candidates that fail to pass the first time. Please look to set the bar so it is fair yet represents the high level of ability you want working for you.

A long journey begins with one step. We are counting on our curriculum development teams to start generating our bank of test questions (with an answer key) based on the milestones they choose in the curriculum segment(s) they are preparing. If we work together to create a good range of difficulty in those questions, we can be well on our way toward that certification program we want. There is plenty of room for creativity in this effort, including the use of graphics and photographs.

Thanks again for your willingness to contribute. Please call or e-mail Ross Andersen, New York, with questions or comments at (518) 457-3146 or [ross.andersen@agmkt.state.ny.us](mailto:ross.andersen@agmkt.state.ny.us).

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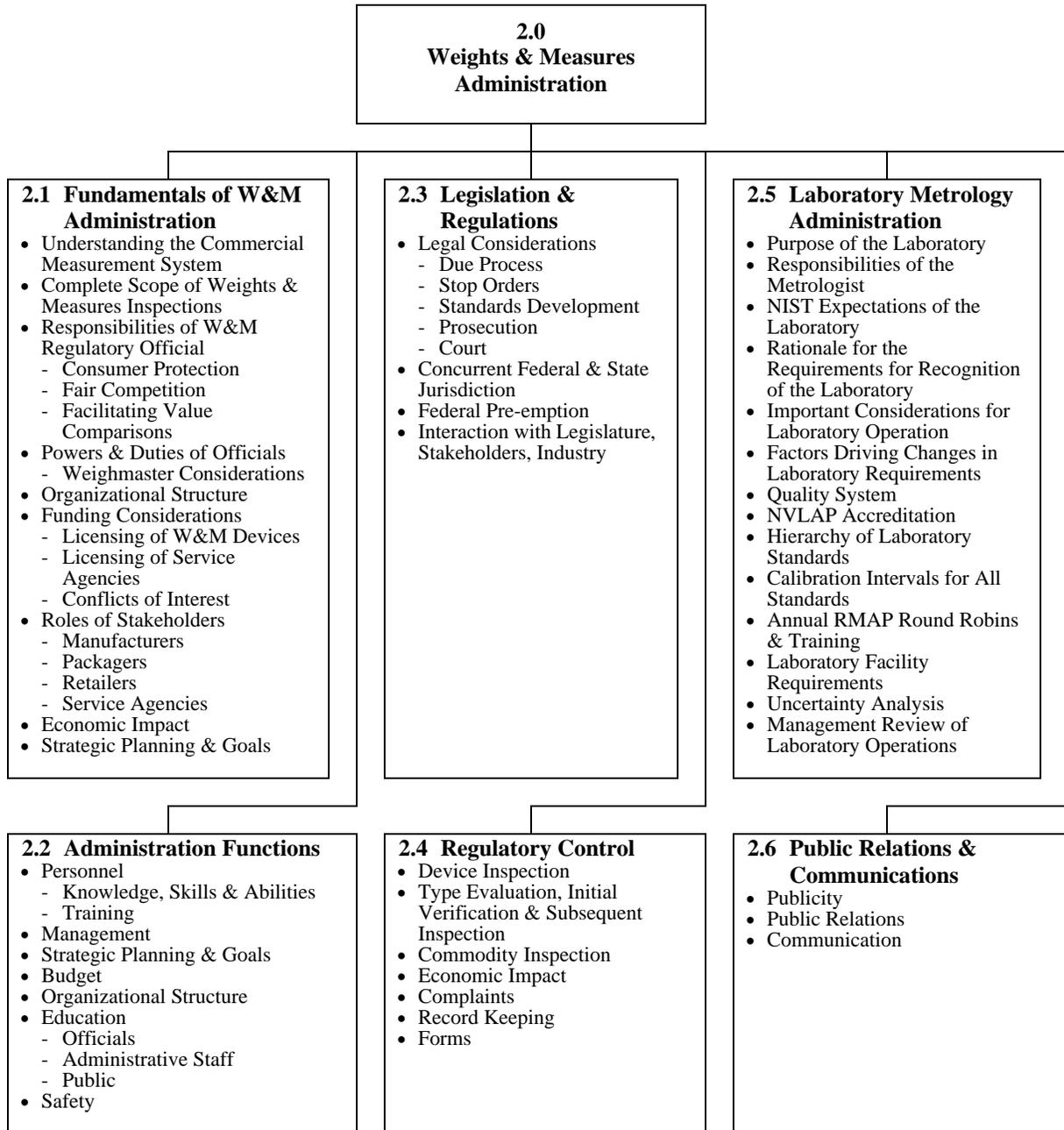
## Appendix G

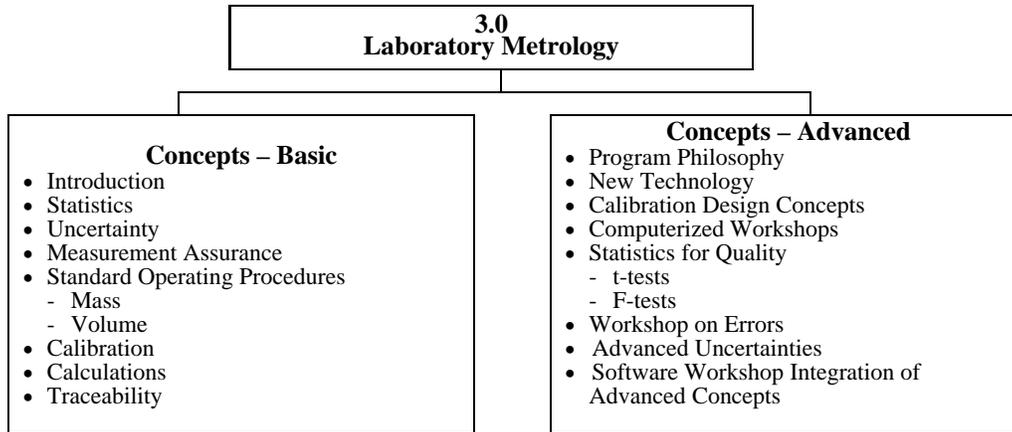
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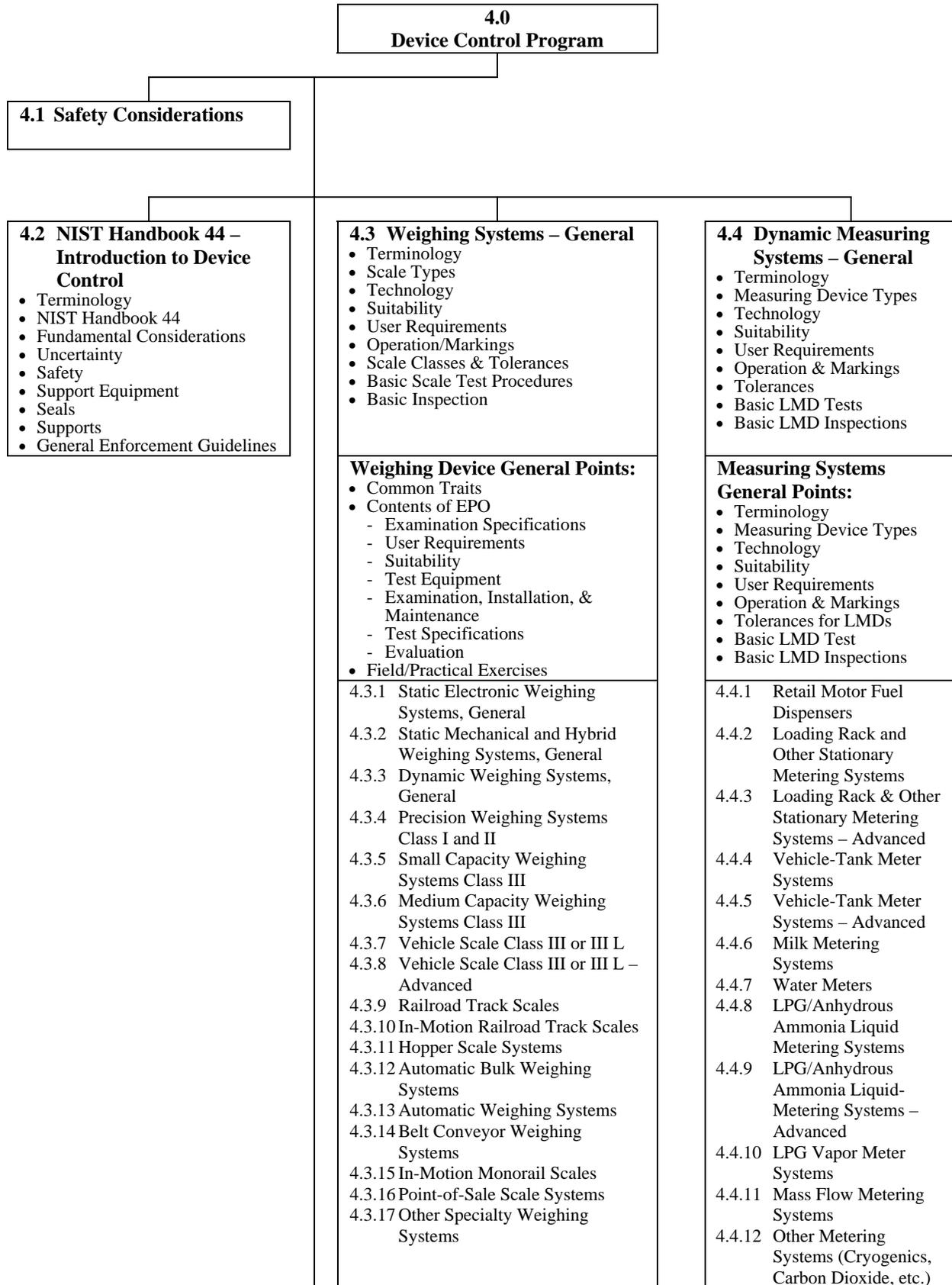
*Revised November 2007*

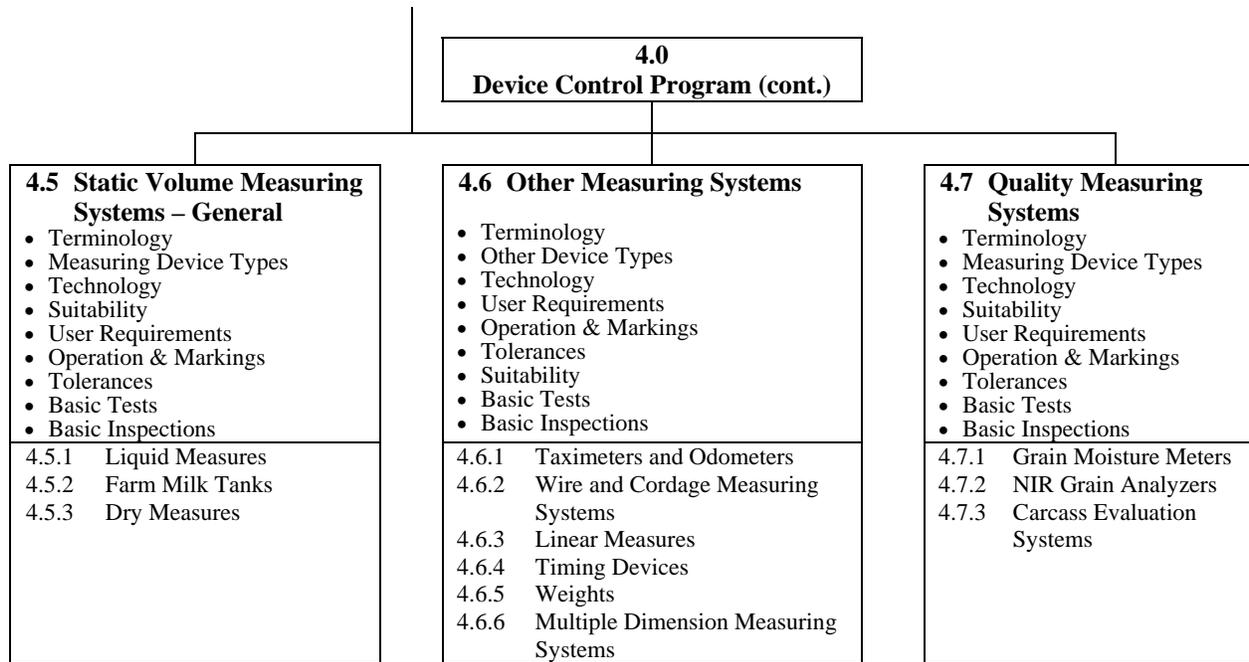
1.0 Fundamentals of Weights & Measures	2.0 Weights & Measures Administration	3.0 Laboratory Metrology	4.0 Device Control Program	5.0 Market Practices, Laws and Regulations (NIST HB 130), & Commodities (NIST HB 133)
1.1 Introduction to W&M Programs  1.2 W&M Laws & Regulations  1.3 Field Standards & Test Equipment  1.4 State Program Scope & Overview	2.1 Fundamentals of W&M Administration  2.2 Administration Functions  2.3 Legislation & Regulations  2.4 Regulatory Control  2.5 Laboratory Metrology Administration  2.6 Public Relations & Communications	3.1 NIST Basic Metrology  3.2 NIST Advanced Metrology	4.1 Safety Consideration – Device Control  4.2 NIST Handbook 44 – Introduction to Device Control  4.3 Weighing Systems – General  4.4 Dynamic Measuring Systems – General  4.5 Static Volume Measuring Systems – General  4.6 Other Measuring Systems  4.7 Quality Measuring	5.1 Safety Considerations – Market Practices  5.2 NIST Handbook 130 – Laws & Regulations  5.3 NIST Handbook 133 - Package Net Contents Control  5.4 Test Purchases  5.5 E-Commerce

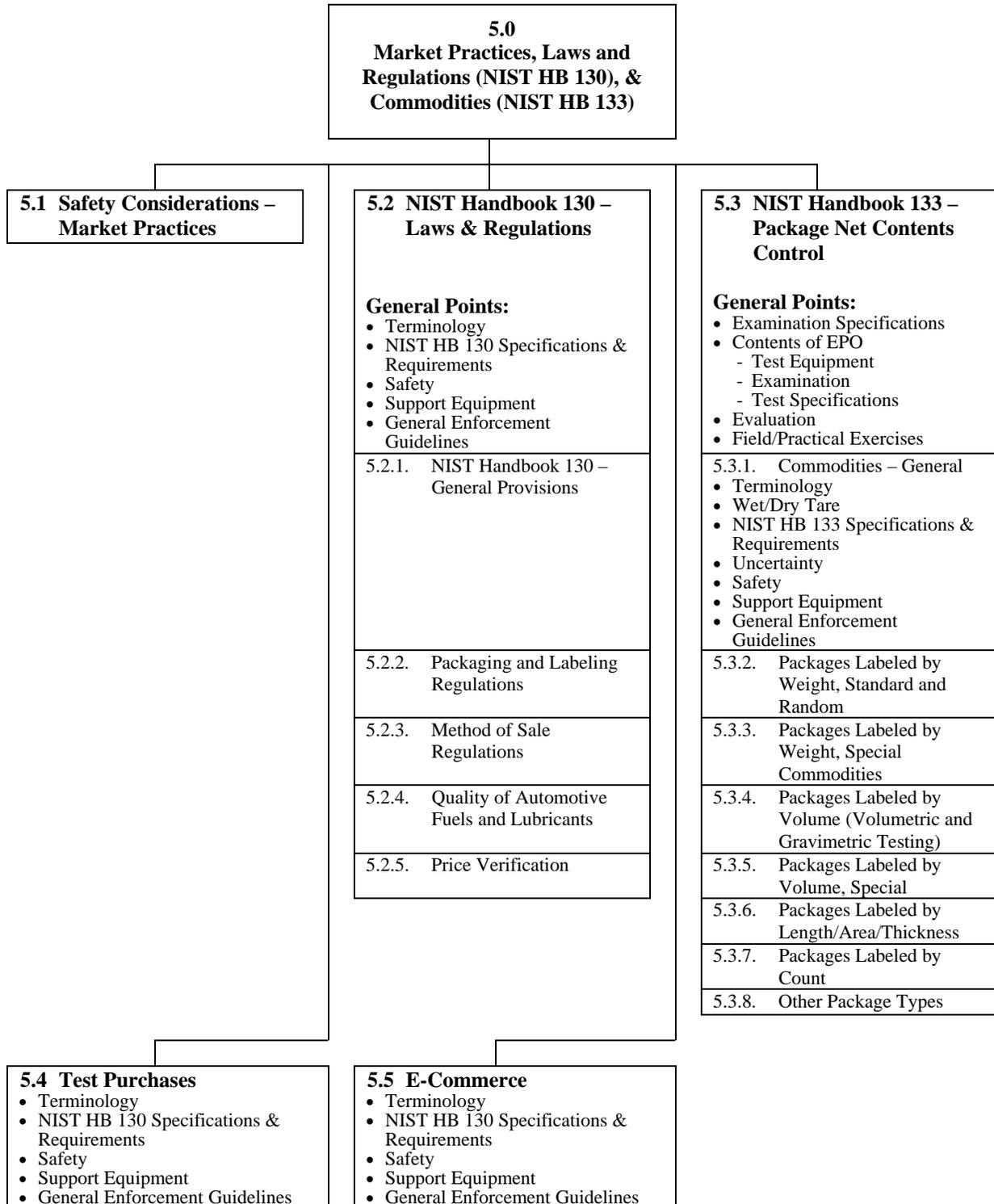
1.0 Fundamentals of Weights & Measures			
<b>1.1 Introduction to W&amp;M Programs</b> <ul style="list-style-type: none"> <li>• History</li> <li>• Need for W&amp;M</li> <li>• Roles in Society</li> <li>• Official Powers &amp; Duties</li> <li>• System of W&amp;M</li> <li>• Associations                             <ul style="list-style-type: none"> <li>- Regional, State, Federal</li> </ul> </li> <li>• Federal Agencies</li> <li>• Relationship to National &amp; International W&amp;M</li> <li>• W&amp;M in U.S. &amp; Your State</li> </ul>	<b>1.2 W&amp;M Laws &amp; Regulations</b> <ul style="list-style-type: none"> <li>• Relationship to National &amp; International W&amp;M</li> </ul>	<b>1.3 Field Standards &amp; Test Equipment</b> <ul style="list-style-type: none"> <li>• Field Standards</li> <li>• Test Equipment</li> <li>• Metrology Laboratory</li> </ul>	<b>1.4 State Program Scope &amp; Overview</b> <ul style="list-style-type: none"> <li>• State Laws</li> <li>• State Administrative Issues                             <ul style="list-style-type: none"> <li>- Completion of administrative forms</li> <li>- Review of rules and policies</li> </ul> </li> </ul>











## **Appendix H**

### **Curriculum Package**

#### **The National Conference on Weights and Measures**

#### **National Training Program CURRICULUM WORK PLAN**

*Revised November 2007*

#### **Segment/Subject**

##### **Level 1/Level 2/Level 3**

#### **1.0 Fundamentals of Weights and Measures**

- 1.1 Introduction to W&M Programs
- 1.2 W&M Laws and Regulations
- 1.3 Field Standards & Test Equipment
- 1.4 State Program Scope and Overview

#### **2.0 W&M Administration**

- 2.1 Fundamentals of W&M Administration (Commercial System, Powers & Duties, etc.)
- 2.2 Administration Functions (Personnel, Management, Budget, Safety, etc.)
- 2.3 Legislation and Regulations (Legal Considerations, Interaction with Legislature, Stakeholders, Industry, etc.)
- 2.4 Regulatory Control (Device inspection, commodities, complaints)
- 2.5 Laboratory Metrology Administration (Purpose of Laboratory, Responsibilities of Metrologist, NIST Expectations for Recognition of Laboratory, Quality System, Training Requirements, etc.)
- 2.6 Public Relations & Communications (Publicity, Public Relations, Communications)

#### **3.0 Laboratory Metrology**

- 3.1. NIST Basic Metrology
- 3.2. NIST Advance Metrology

#### **4.0 Device Control Program**

- 4.1 Safety Considerations
- 4.2 NIST Handbook 44 – Introduction to Device Control
- 4.3 Weighing Systems General
  - 4.3.1 Static Electronic Weighing Systems, General
  - 4.3.2 Static Mechanical and Hybrid Weighing Systems, General
  - 4.3.3 Dynamic Weighing Systems, General
  - 4.3.4 Precision Weighing Systems Class I and II
  - 4.3.5 Small Capacity Weighing Systems Class III
  - 4.3.6 Medium Capacity Weighing Systems Class III
  - 4.3.7 Vehicle Scale Class III or III L
  - 4.3.8 Vehicle Scale Class III or III L – Advanced
  - 4.3.9 Railroad Track Scales
  - 4.3.10 In-Motion Railroad Track Scales
  - 4.3.11 Hopper Scale Systems
  - 4.3.12 Automatic Bulk Weighing Systems
  - 4.3.13 Automatic Weighing Systems
  - 4.3.14 Belt Conveyor Weighing Systems
  - 4.3.15 In-Motion Monorail Scales
  - 4.3.16 Point-of-Sale Scale Systems

- 4.3.17 Other Specialty Weighing Systems
- 4.4 Dynamic Measuring Systems – General
  - 4.4.1 Retail Motor Fuel Dispensers
  - 4.4.2 Loading Rack and Other Stationary Metering Systems
  - 4.4.3 Loading Rack & Other Stationary Metering Systems – Advanced
  - 4.4.4 Vehicle-Tank Meter Systems
  - 4.4.5 Vehicle-Tank Meter Systems – Advanced
  - 4.4.6 Milk Metering Systems
  - 4.4.7 Water Meters
  - 4.4.8 LPG/Anhydrous Ammonia Liquid Metering Systems
  - 4.4.9 LPG/Anhydrous Ammonia Liquid-Metering Systems – Advanced
  - 4.4.10 LPG Vapor Meter Systems
  - 4.4.11 Mass Flow Metering Systems
  - 4.4.12 Other Metering Systems (Cryogenics, Carbon Dioxide, etc.)
- 4.5 Static Volume Measuring Systems – General
  - 4.5.1 Liquid Measures
  - 4.5.2 Farm Milk Tanks
  - 4.5.3 Dry Measures
- 4.6 Other Measuring Systems
  - 4.6.1 Taximeters and Odometers
  - 4.6.2 Wire and Cordage Measuring Systems
  - 4.6.3 Linear Measures
  - 4.6.4 Timing Devices
  - 4.6.5 Weights
  - 4.6.6 Multiple Dimension Measuring Systems
- 4.7 Quality Measuring Systems
  - 4.7.1 Grain Moisture Meters
  - 4.7.2 NIR Grain Analyzers
  - 4.7.3 Carcass Evaluation Systems

**5.0 Market Practices, Laws and Regulations (NIST HB 130), & Commodities (NIST HB 133)**

- 5.1 Safety Considerations – Market Practices, NIST HB 130, NIST HB 133
- 5.2 NIST Handbook 130 – Laws & Regulations
  - 5.2.1 NIST Handbook 130 – General Provisions
  - 5.2.2 Packaging and Labeling Regulations
  - 5.2.3 Method of Sale Regulations
  - 5.2.4 Quality of Automotive Fuels and Lubricants
  - 5.2.5 Price Verification
- 5.3 NIST HB 133 – Package Net Contents Control
  - 5.3.1 Commodities – General
  - 5.3.2 Packages Labeled by Weight, Standard and Random
  - 5.3.3 Packages Labeled by Weight, Special Commodities
  - 5.3.4 Packages Labeled by Volume (Volumetric and Gravimetric Testing)
  - 5.3.5 Packages Labeled by Volume, Special
  - 5.3.6 Packages Labeled by Length/Area/Thickness
  - 5.3.7 Packages Labeled by Count
  - 5.3.8 Other Package Types
- 5.4 Test Purchases
- 5.5 E-Commerce

**Note:** Initial Verification has been intentionally been left off this listing and will be addressed later.

## Appendix I

### Model Professional Development Training and Certification Standards Statute for Inspectors and Sealers of Weights and Measures

*Submitted by NEWMA, October 2007*

#### **DRAFT**

1. **Definition of Terms:** Unless defined otherwise by statute, the definitions contained herein shall apply to this statute.
  - 1.1 **Commission:** The permanent advisory commission appointed pursuant to this statute to develop, plan, and certify training standards, certification, and continuing education.
  - 1.2 **Director [Commissioner or other senior state official]:** Charged by statute to administer, guide, or direct Weights and Measures activities within the state at state, county, or municipal level.
  - 1.3 **Sealers and Inspectors of Weights and Measures:** Those public officials appointed pursuant to existing law to inspect, approve, or condemn weighing and measuring devices or perform other activities as directed by statute or regulation. This definition shall also apply to deputy, assistant, or associate Sealers and Inspectors of Weights and Measures.
  - 1.4 **Industry Specialists:** Those individuals approved and/or licensed by the State Director to inspect, approve, or condemn specific classes or types of weighing and measuring devices.
2. **Certification and Standards Commission**
  - 2.1 **Appointment:** There shall be a permanent standing advisory commission comprised of the director of the state weights and measures department or his designee, and a designee from each of the following organizations: the State Weights and Measures Association, the various Regional Weights and Measures Associations, and one individual representing Industry Specialists. Members of said commission shall serve without compensation. Said commission shall be chaired by the director or deputy director of weights and measures.
  - 2.2 **Rule Making Authority:** The commission shall promulgate rules and regulations necessary to implement and maintain this statute consistent with existing rule-making state legislation.
  - 2.3 **Duties:** The commission shall develop, and from time to time, revise the certification and continuing education requirements that are established by the Department of Weights and Measures with the advice and consent of the commission. The commission shall certify all inspectors, sealers and deputies and industry specialists in accordance with sections [insert specific statute citation covering the appointment of these officials] and regulations promulgated by the commission including, but not limited to, regulations covering initial written certification testing for inspectors, sealers and deputies and industry specialists as well as mandatory continuing education programs for inspectors, sealers and deputies, and industry specialists to maintain their certifications. Every store, retail establishment, food store or food department and all merchants within the jurisdiction of the state department of weights and measures shall provide adequate space for the display of information relative to how the state inspector, local sealer or inspector or the department of weights and measures can be contacted as provided in regulations to be promulgated by the commission. Notwithstanding any certification exemption, all sealers, inspectors, deputy sealers, deputy inspectors, and industry specialists shall participate in continuing education programs. The commission shall establish a training and education fee to be paid by the state, county, municipality, or industry specialist's organization, which employs such sealer, inspector, deputy sealer and deputy inspector, or industry specialist sufficient to offset the cost of providing such training and education.

2.4 **Fees:** There shall be a revolving account established into which shall be deposited any training and education fees paid by the state, county, municipality, or industry specialist. These fees shall be used to offset any cost associated with providing such training and education mandated by the commission.

### 3. Appointment of Sealers, Inspectors, Deputy Sealers

3.1 **Appointment:** The sealer, inspector, and all deputies shall be certified by the commission within one year after assuming their powers and duties. Failure to become certified within one year shall be cause for termination; provided, however, sealers, inspectors or deputy sealers or deputy inspectors, employed by the state, county, or a municipality upon the effective date of this paragraph, shall become certified within two years. Sealers, inspectors or deputy sealers or deputy inspectors who pass a civil service exam for a position as a sealer, inspector or deputy sealer or deputy inspector of weights and measures, shall be exempt from initial certification requirements provided that said civil service exam contains questions and/or practices consistent with initial certification requirements.

3.2 **Continuing Education:** Notwithstanding any certification exemption, all sealers, inspectors and deputy sealers and deputy inspectors shall participate in continuing education programs. The commission shall establish a training and education fee to be paid by the county or municipality which employs such sealer, inspector, deputy sealer and deputy inspector sufficient to offset the cost of providing such training and education.

### 4. Appointment of Industry Specialists

4.1 **Appointment:** All industry specialists shall be certified by the commission prior to assuming their powers and duties as licensed industry specialists; provided, however, industry specialists performing such duties shall become certified within one year from the effective date of this statute. Failure to become certified prior to assuming their powers and duties as industry specialists shall render any inspections conducted null and void and such individuals shall be barred from further inspections for a period of not less than one year.

4.2 **Continuing Education:** Notwithstanding the appointment of industry specialists, they shall participate in continuing education programs approved by the commission. The commission shall establish a training and education fee to be paid by the business or organization employing industry specialists sufficient to offset the cost of providing such training and education.

5. **Conflict with other Laws:** Whenever the application of any provision of any other law of this state conflict with the application of any provision of sections one through four, inclusive, said sections shall prevail.

6. **Partial Invalidity:** If any provision of said sections one to four, inclusive, or the application of said sections shall be held invalid, the remainder of said sections, or the application of such provision to any person or circumstance other than that as to which it is invalid, shall not be affected thereby.