Module: 4.2

NIST Handbook 44 - Introduction to Device Control

Overview and Scope

This module sets standards for basic inspection and testing of devices used in commercial trade. The module is geared toward general and basic concepts that can be applied to all weighing and measuring equipment. These concepts range from the range of devices regulated under weights and measures regulations to the legal basis for those regulations, the organization and basic elements of NIST Handbook 44 General Code and Appendices, and the NTEP Evaluation program.

Prerequisites

None

Learning Objectives

1 Scope and Legal Basis of Commercial Device Regulation

A weights and measures inspector should understand the wide scope of device control regulations and the scope and legal basis for official actions. To demonstrate this, the inspector can:

1.1 List some of the wide variety of commercial devices under weights and measure jurisdiction.

1.2 Cite the sections of law authorizing the inspection and testing of commercial devices.

1.3 Cite the laws/regulations adopting device specifications and tolerances, i.e. NIST Handbook 44.

1.4 Describe the enforcement powers granted to the director to deal with devices that are incorrect or inaccurate.

1.5 Describe the enforcement tools available to the inspector to deal with devices that are incorrect or inaccurate.

1.6 Explain the purpose for each of the main parts of the metrological control system for devices, i.e. type approval, initial verification and subsequent verification.

1.7 Describe the organization of the device inspection program in the jurisdiction and where the individual fits into the chain of command.

2 Basic Organization and Fundamental Considerations of NIST Handbook 44

A weights and measures inspector should understand the organization of Handbook 44 and the fundamental considerations used throughout the document. To demonstrate this, the inspector can:

2.1 Discuss how Handbook 44 is created and updated through the work of NCWM and NIST.

2.2 Describe how Handbook 44 is organized and the system of paragraph designations.

2.3 Locate definitions of terms used in Handbook 44.

2.4 Explain the theory of tolerances and the use of adjustments.

2.5 Describe the basic requirements for standards used to enforce Handbook 44.

2.6 Discuss the difference between inspection and testing and the importance of each.

2.7 Indicate the difference between being accurate and being correct.

2.8 Relate the jurisdiction policy on making adjustments to commercial devices.

2.9 Describe the types of official "seals" used by inspectors and where they are applied.

2.10 Apply the rules for reading indications and rounding of numerical values.

3 Units and Systems of Measurement and General Tables of Units of Measurement

A weights and measures inspector should understand the organization and use of units of measurement in both the metric (SI) system and the customary system. To demonstrate this, the inspector can:

3.1 Explain the difference between a unit and a standard.

3.2 Classify various units of measure in the two major units systems, Customary and Metric.

3.3 Describe how units are subdivided, either in decimal fractions or binary fractions.

3.4 Know how to find conversion factors between measurement units, and be capable of converting measurement values from one unit to another while retaining the significant figures in the value.

4 Certification, Use, and Care of Field Standards

A weights and measures inspector should understand the legal connection between the physical standards employed in the work and national standards and how this connection is maintained. The inspector should also understand how to use and care for those physical standards. To demonstrate this, the inspector can:

4.1 Define the principle of traceability and explain how this relates to the legal work of weights and measures.

4.2 Interpret information on a report of test for standards.

4.3 Recognize that physical standards must be recertified if damaged or if there are other reasons to suspect the standard may be compromised.

4.4 Explain the process to evaluate suitability of physical standards for use in an inspection under Handbook 44.

4.5 Demonstrate how to use test weights, test measures, and other types of standards and how to care for them when not in use.

5 Handbook 44 - General Code:

A weights and measures inspector should be able to apply the provisions of the Handbook 44 General Code. To demonstrate this, the inspector can:

5.1 Explain each of the Application Section paragraphs of the General Code, particularly the sections dealing with the terms "retroactive" and "non-retroactive" as they are used in Handbook 44.

5.2 Define the term "commercial" as it relates to the legal scope of commercial device regulation and interpret, for common instances, whether a device is being used commercially.

5.3 Restate and apply each of the Specification paragraphs in the General Code.

5.4 Discuss each of the Notes paragraphs in the General Code.

5.5 Explain and apply the Tolerances paragraphs in the General Code, particularly the application of acceptance and maintenance tolerances.

5.6 Restate and apply each of the User Requirements in the General Code.

5.7 Cite any General Code requirement in the form that would be used in a legal action.

6 Type Approval and NTEP

A weights and measures inspector should understand the type approval process within the jurisdiction and its relationship to the NCWM National Type Evaluation Program. To demonstrate this, the inspector can:

6.1 Explain how type approval is used in the device regulation program in the jurisdiction.

6.2 Discuss the NCWM NTEP Program and how it is used in the jurisdiction.

6.3 Restate what a Certificate of Conformance is and what it represents.

6.4 Relate how manufacturers obtain an NTEP Certificate of Conformance.

6.5 Describe how a Certificate of Conformance is formatted and the kinds of information provided on it.

6.6 Explain the meaning of the terms "active", "inactive" and "withdrawn" in respect to a Certificate of Conformance.

6.7 Demonstrate where to find a Certificate of Conformance for a device.

Contributors:

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