National Conference on Weights and Measures
"That Equity May Prevail"
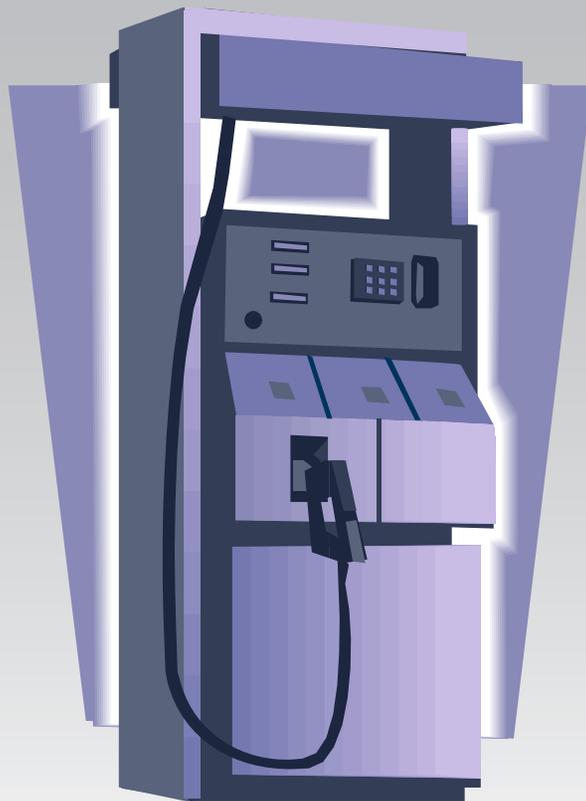
2012 Software Sector Activity

Background issues

- State inspectors report difficulties in the field related to software:
    - Situations where inspector cannot identify Certificate of Conformance number for device/software
    - Situations where the software version/revision does not match what was marked or approved
    - Situations where inspector cannot even determine if operating software is or needs to be type approved!
- State inspectors not all prepared to deal with software related issues
    - Device and/or software is complex
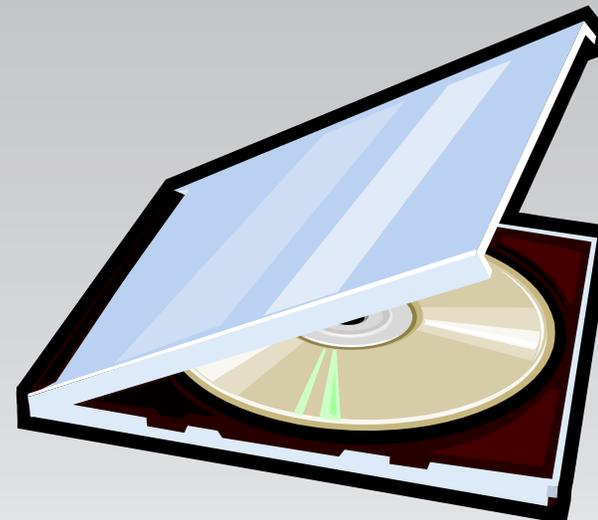   - Interaction required to perform validation

Device containing embedded software (firmware)

Standalone software package

Additional concerns

- Several Regions and other interested parties such as the Scale Manufacturer's Association (SMA) have indicated a preference that all NTEP applications that involve software (i.e. both standalone software packages and software based devices) should be subject to the same requirements. The Sector concurs and feels this could simplify existing requirements by eliminating exceptions.

Software Sector Consensus

- Revision information should be required for ALL metrologically significant software
- This information is best provided by the software itself (no guarantee a hard-marked revision matches what is running)
- Serial numbers are used to identify the specific instance of a Type of equipment
  - A piece of physical equipment is unique and needs a serial number
  - Software by itself is non-unique; it does **not** need a serial number

Key Concepts to Address

- All metrologically significant software, embedded or PC, needs version/revision identification
  - Today only "not built for purpose" (PC) software is required to identify revision/version
- Software must self-identify its version/revision for the information to be useful; hard marking the software version/revision on a device is less desirable
- Changes to metrologically significant software made after placement in service must be evident
  - Must know the fact of a change, should know the date of a change

Effecting these changes

- Handbook 44: Current marking requirements for software in GS-1 different for built-for-purpose and not-built-for-purpose

- HB44 has wide reaching impact and changes are understandably scrutinized by all, difficult to modify

- New goal is to implement the consensus items with minimal impact on existing language

Modifications to G-S.1

- **Modification 1 - Simplify serial number marking requirement - remove 'not-built-for-purpose', include 'software':**

G-S.1. Identification. –

> (c) a nonrepetitive serial number, except for equipment with no moving or electronic component parts and ~~not-built-for-purpose software-based devices~~ <u>software</u>;

Modifications to G-S.1

- **Modification 2 - remove 'not-built-for-purpose' to expand the Version/Revision requirement to include software AND all devices utilizing software:**

G-S.1. Identification. –

(d) the current software version or revision identifier ~~for not-built-for-purpose software-based electronic devices~~;

- *[Nonretroactive as of January 1, 2004]*
- (Added 2003) **(Amended 20XX)**

Modifications to G-S.1

- **Modification 3 – require software revision to be presented by the software itself:**

Add new clause to G-S.1. Identification., section (d):

word "Number" shall, as a minimum, begin with the letter "N" (e.g., No or No.).

[Nonretroactive as of January 1, 2007]

(Added 2006)

(3) The version or revision identifier shall be accessible via the display. Instructions for displaying the version or revision identifier shall be described in the CC. As an exception, permanently marking the version or revision identifier shall be acceptable under the following conditions:

- **Modification 3 (continued) – Include exceptions to new requirement software revision to be presented by the software itself:**

  (a) The user interface does not have any control capability to activate the indication of the version or revision identifier on the display, or the display does not technically allow the version or revision identifier to be shown (analog indicating device or electromechanical counter) or

  (b) the device does not have an interface to communicate the version or revision identifier

  (Amended 1985, 1991, 1999, 2000, 2001, 2003, ~~and,~~ 2006 **and 201X**)

*G-S.1.1. Location of Marking Information for ~~Not Built For Purpose~~ **all** Software-Based Devices. ~~–~~For ~~not-built-for-purpose,~~ software-based devices, either:*

(a) The required information in G-S.1. Identification. (a), (b), ~~(d)~~, and (e) shall be permanently marked or continuously displayed on the device; or

Future vision

- Eliminate G-S.1.1 altogether; merge into G-S.1
- Finalize definition of 'easily recognizable' menu selections/icons
- Add an additional requirement to link the software and the identifier (version/revision, checksum, etc.)

  "The version or revision identifier shall be directly and inseparably linked to the software itself. The version or revision identifier may consist of more than one part, but at least one part shall be dedicated to the metrologically significant software."

- The updating of metrologically significant software shall be considered a sealable event. (Pub 14)
- Assist in software-specific field training curriculum