National Type Evaluation Program (NTEP)
Software Sector Meeting Agenda

August 17th – 18th, 2022 / Milwaukee, WI
In conjunction with the NTEP Weighing Sector meeting

INTRODUCTION

The charge of the National Type Evaluation Program (NTEP) Software Sector is important in providing appropriate type evaluation criteria for software-based weighing or measuring device based on specifications, tolerances and technical requirements of *NIST Handbook 44* Section 1.10 General Code, Section 2 for weighing devices, Section 3 for liquid and vapor measuring devices, and Section 5 for taximeters, grain analyzers, and multiple dimension measuring devices. The sector's recommendations are presented to the NTEP Committee each January for approval and inclusion in *NCWM Publication 14 Technical Policy, Checklists, and Test Procedures* for national type evaluation.

The sector is also called upon occasionally for technical expertise in addressing difficult *NIST Handbook 44* issues on the agenda of the National Conference on Weights and Measures (NCWM) Specifications and Tolerances (S&T) Committee. Sector membership includes industry, NTEP laboratory representatives, technical advisors and the NTEP Administrator. Meetings are held annually, or as needed and are open to all NCWM members and other registered parties.

Suggested revisions are shown in **bold face print** by ~~striking out~~ information to be deleted and **underlining** information to be added. Requirements that are proposed to be non-retroactive are printed in ***bold faced italics***.

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Table B
Glossary of Acronyms and Terms

Acronym	Term	Acronym	Term
BIML	International Bureau of Legal Metrology	OIML	International Organization of Legal Metrology
CC	Certificate of Conformance	OWM	Office of Weights and Measures
EPO	Examination Procedure Outline	PDC	Professional Development Committee
NCWM	National Conference on Weights and Measures	S&T	Specifications and Tolerances Committee
NIST	National Institute of Standards and Technology	SMA	Scale Manufacturers Association
NTEP	National Type Evaluation Program	WELMEC	European Cooperation in Legal Metrology

Details of All Items
(In order by Reference Key)

WELCOME

Since the Software Sector meeting is a joint meeting with the MDMD work group, some time will be allocated to meet and greet both new and familiar faces.

STATUS REPORTS – RELATED NCWM AND INTERNATIONAL ACTIVITY

Attendees of the 2022 NCWM Interim and Annual Meeting are asked to share any relevant comments or discussion that took place during the open hearings or NCWM Standards and Tolerances (S&T) committee working sessions. Results related to items on our Agenda were of particular focus.

Dr. Katya Delak, NIST Office of Weights and Measures (OWM), will provide a synopsis of international activity that relates to the work of the sector. (See appendix B)

JOINT SESSION PROGRESS REPORT, ACTIVE ITEMS OF MUTUAL INTEREST

This is the second joint meeting of these groups. To make sure we make the most of the time a quick review of the agenda items from both Sectors will be held to identify those that require collaboration, so all participants have a solid foundation for discussion. As part of this review, items of importance or interest should be allocated more time during the joint session day.

CARRY-OVER ITEMS

1.   Software Identification / Markings

Source:
NTEP Software Sector

Background:
See the 2021 Software Sector Meeting Summary for more background on this item.

The bulk of the work on this item resulted in the final, amended proposal for a modification to G-S.1. being accepted as a Voting item at the 2016 Interim meeting, which was adopted at the 2016 Annual Meeting The current G-S.1 reflects the Sector-recommended language. The non-retroactive date was 2021, so the current language is applicable to all devices placed into service as of this year.

The item remains on the agenda since there was additional discussion regarding a secondary goal - if we can alter G-S.1.e. sufficiently, we may be able to eliminate G-S.1.1. Darrell Flocken recommended that we begin working on this item prior to 2022 given that it may take some time for others to accept any changes we propose.

G-S.1.1. Location of Marking Information continues to use the terminology "Not-Built-For-Purpose". We would prefer to reduce the usage of that term and "Built-For-Purpose" (or eliminate them altogether). Those categories continue to blur as time goes by. It was acknowledged that it is always more difficult to alter the general code.

Darrell Flocken reported that NTEP is challenged when they get software running on e.g. a phone or tablet. Developers have sometimes failed to properly display the version number, which makes it difficult for inspectors to view the information. Pub. 14 should indicate that continuously displaying the version number is the most preferred method. HB44 has the requirement, and Pub. 14 is for explaining how to comply.

The group agreed with the interpretation that 'Continuously displayed' is intended to mean while in operating mode. The CC has to be permanently marked or continuously displayed. This allows the information for accessing the version number to be within the CC.

Zach Tripoulas asked whether the group thought that the Scale Marking Requirements are congruent with G-S.1. It was pointed out that some of the exceptions noted in G-S.1. are intended to cover applications that can't comply with the general requirements. One example is 7-segment displays. Refer to G-S.1.d.1.i. and G-S.1.d.1.ii.

Darrell Flocken recommends that we plan a review of the contents of HB44 to verify that it correctly reflects our understanding of the intent. From there, we can clarify matters within Pub. 14, potentially within a checklist. Then we can come back to determine whether any changes are needed to HB44. Jim Pettinato expressed concern that eliminating differences between Not-Built-For-Purpose and Built-For-Purpose will require rewriting rather than minor tweaks to HB44.

The Sector agreed to focus on Pub. 14 for now and revisit this time permitting in 2022.

2. **Identification of Certified Software**

Source:
NTEP Software Sector

Background:
See the 2021 Software Sector Meeting Summary for more background on this item.

This item originated as an attempt to answer the question "How does the field inspector know that the software running in the device is the same software evaluated and approved by the lab?"

One possibility is adding a clause to the marking requirements in G-S.1. similar to that below:

> **(3)** **The version or revision identifier shall be directly and inseparably linked to the software itself.**
>
> **Note: 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.**
> *[Nonretroactive as of January 1, 202X]*
> **(Added 20XX)**

Concern was expressed that this could cause confusion with field inspectors. Software separation isn't something that's intended to be useful in the field, it is intended to ease type approval and software maintenance release processing. - This would lend weight to the argument of keeping it in Pub. 14.

If the Sector desires to include this in Pub. 14, we would need to identify all the sections where this concept would need to be added. The Software Sector doesn't have the authority to add it to the other sectors' Pub. 14's. Darrell Flocken reported that a note regarding the concept of software separation has already been added to several of the various Pub. 14 sections.

It was agreed that we would table this item until the 2021 meeting, at which time we will propose the following (updated) wording for the 2022 Pub. 14:

3. Additional Marking Requirements- Software

Identification of Certified Software:
The manufacturer must describe and possibly demonstrate how the version or revision identifier is directly and inseparably linked to the metrologically significant software. Where the version revision identifier is comprised of more than one part, the manufacturer shall describe which portion represents the metrological significant software and which does not.

Note: Manufacturers may choose to separate metrologically significant software from non-metrologically significant software. Separation would allow the revision of the non-metrological portion without the need for further evaluation. In addition, non-metrologically significant software may be updated on devices without breaking a seal, if so designed. Separation of software requires that all software modules (programs, subroutines, objects, etc.) that perform metrologically significant functions or that contain metrologically significant data domains form the metrologically significant software part of a measuring instrument (device or sub-assembly). If the separation of the software is not possible or needed, then the software is metrologically significant as a whole.

Now that the Software Sector has its own Pub. 14, the question was raised as to whether the proposed text need to be part of Handbook 44. Darrell Flocken recommended that the Sector continue to move forward this item with the goal of inclusion of the proposed text into HB44. There was general consensus on this approach.

The Sector will prioritize work on the Pub. 14 software section. We will consider revisions to G-S.1.1 as well as the changes pending as described in Agenda Item 1, since the non-retroactive dates will be expiring.

Jim Pettinato and Darrell Flocken both expressed the opinion that these recommendations and information regarding software separation do not constitute a marking requirement. G-S.1. already includes a marking requirement for a version / revision.

This wording has already been incorporated into Pub. 14's for the various sectors, prior to the creation of a Software Pub. 14. Eventually Darrell Flocken will have to go back and convince the other sectors to remove the redundant wordage from their Pub. 14s.

Once the Sector has satisfactorily included language within Pub. 14 to address this point, we will consider this agenda item finalized.

3. Software Protection / Security

Source:
NTEP Software Sector

Background:
See the 2021 Software Sector Summary for additional background on this item.

The Sector continued to develop a proposed checklist for *NCWM Publication 14*. The numbering will still need to be added. This is based roughly on R 76 – 2 checklist and discussions beginning as early as the October 2007 NTEP Software Sector Meeting. The information requested by this checklist is currently voluntary, however, it is recommended that applicants comply with these requests or provide specific information as to why they may not be able to comply. Based on this information, the checklist may be amended to better fit with NTEP's need for information and the applicant's ability to comply.

The California, Maryland and Ohio laboratories agreed to use this check list on one of the next devices they have in the lab and report back to the sector on what the problems may be. In February 2011, the North Carolina laboratory was also given a copy of the check list to try.

The labs using this checklist on a trial basis indicated that there was some confusion as to versions/wording. There may be more than one version in circulation. The version shown in this Summary shall be used henceforth.

The most recent draft of the checklist was distributed with the agenda for the 2022 meeting.

The bulk of the feedback to date has been that the checklist needs some guidance to complete. Once the Sector has satisfactorily included language within Pub. 14 to address this point, we will consider this agenda item finalized.

Jim Pettinato and Darrell Flocken both expressed the opinion that these recommendations and information regarding software separation do not constitute a marking requirement. G-S.1. already includes a marking requirement for a version / revision.

This wording or something similar has already been incorporated into Pub. 14's for the various sectors, prior to the creation of the Software Policy document. Eventually Darrell Flocken will have to go back and convince the other sectors to remove the redundant wordage from their Pub. 14s.

4.   NTEP Application for Software and Software-based Devices

Source:
NTEP Software Sector

Background:
See the 2021 NTEP Software Sector Meeting Summary for additional history on this agenda item.

The purpose of initiating this item was to identify issues, requirements and processes for type approving device applications, specifically for not-built-for-purpose software since it is now explicitly allowed. It was suggested that it may be useful to the labs to devise a separate submission form for software for these applications. What gets submitted? What requirements and mechanisms for submission should be available? Validation in the laboratories - all required subsystems shall be included to be able to simulate the system as installed.

Historically, requirements for software-only applications haven't been as high as requirements for software applications that include hardware. The number of software-only applications has increased dramatically over the last few years.

Darrell Flocken asked the NTEP lab evaluators in attendance what they need from the Software Sector to help them interpret the documentation they will receive from the manufacturers in response to this requirement.

At the 2021 meeting it was noted that in practice, there might not be just one application. Instead there might be device-specific applications, e.g. a scale software application. Instead of multiple new applications to address these related packages, perhaps it could be handled as a sub-section added to an existing application. There's a meeting coming up to address the direction of applications which will probably affect matters. It was decided by the Sector to await the outcome of the upcoming NTEP meeting and progress accordingly. The assumption is that the proposed language will be part of the Software Policy document.

5. Training of Field Inspectors

Source:
NTEP Software Sector

Background:
See the 2021 NTEP Software Sector meeting summary for more background on this item.

There is a national EPO from NIST Office of W&M, HB112. Darrell Flocken recommended that we approach NIST regarding adding text regarding software. There are not EPO's for every equipment type. Rick said that HB112 is updated every year. Rick said that the most value to the field inspectors would be to identify for them different means that software can be used to manipulate the metrological system. In particular, how can someone attempt to cheat using software? Jim Pettinato suggested that members of the Software Sector download and review HB112, so that we can have a better idea regarding where we might best target additions to the text. It was noted that recommendations for changes to HB112 should go to Tina Butcher.

It was suggested that perhaps a presentation on this subject at the main and regional NCWM meetings might be a good starting point. Jim Pettinato suggested an entry in the NCWM newsletter, targeted to inspectors, would also help. The newsletter is submitted quarterly. Darrell Flocken confirmed that submissions for the next newsletter are due January 15th. A helpful newsletter article could describe how to find the CC for a system that includes software. Brian Duncan volunteered to write a first draft.

There has also been a request for training on the NTEP process. Darrell Flocken has provided a presentation on this subject in the past, but it may be time for a refresher.

NIST does perform regional training for field inspectors. Sometimes they'll bring a subject matter expert along to assist with the training. Tina Butcher listed several training courses that have been given recently. She also said that there have been requests for training schools in conjunction with the regional meetings. They're sometimes also looking for presentations. Unfortunately, the majority of the attendees aren't necessarily field inspectors.

John Roach said that if we trained CA's main trainers, that information could trickle down to the field inspectors. Jeff Gibson said that a similar approach would work with OH.

Jim Pettinato shared an updated training presentation. It was noted that additional examples of certificates with instructions to access the software identifier and audit trail would be welcome. Chris Senneff volunteered to send Darrell Flocken / Jim Pettinato his certificate.

Tina Butcher suggested recording a webinar.

It was noted that any additional information received regarding specific examples of the implementation of features to support field inspection in real-world devices, will be incorporated into the work-in-progress presentation. If possible, we will arrange to have representation at the NTEP lab meeting as well.

6.   New Publication 14 Section specific to Software

Background:
See the 2021 NTEP Software Sector meeting summary for additional background.

For the past several years, the Sector has been working toward completing a new section of Publication 14 entitled NTEP Software Technical Policy, containing the following sections:

See the NTEP Software Sector Technical Policy draft document as circulated with the Agenda for the full content.

Darrell Flocken said that he'll review our Pub. 14 in detail over the next month to identify elements that do not currently have support in HB44. Subsequent to that, Jim Pettinato can work on a draft to address those concerns. Jan Konijnenburg suggested that the Pub. 14 Sections have references to HB44.

It was pointed out that the title of the document should not include the word 'Administrative'. Instead we will use the title 'Software Technical Policy'. The draft document title and header needs to change to Software Technical Policy. We'll edit it offline since the document has some editing issues.

Section 3 requires training, so that the labs all have a common understanding of what is needs. Darrell Flocken isn't certain that the third bullet point may imply that the NTEP evaluators will be reading a flowchart in detail. He thinks the labs might not be ready for that, and the evaluation process doesn't go that deep for now. That doesn't mean that we should remove the bullet point since it's beneficial to have the submitters ensure that they've thought about the issues.

Patrick Tilley asked about remote software upgrades. Darrell Flocken replied that the software upgrade would need to be recorded in the audit trail as an event log entry. Jan Konijnenburg explained the OIML approach used in Europe and how different countries can handle it differently. Ron Peasley also pointed out that it's device-specific in Europe, dependent on risk category.

Teri Gulke will ask her company's marketing if they can provide additional examples of potential icons to use to access the version number.

Jim Pettinato will make the identified edits to the draft Software Technical Policy and circulate to the Sector for comments.

7.   Next Meeting

Background:
The sector is on a yearly schedule for NTEP Software Sector Meetings. Now that we've adopted a joint meeting system, the next Sector joint meeting will likely coincide with one of the remaining Sector meetings.

If we continue with our joint meetings, 2023 would be in conjunction with the Measuring Sector.

Appendix A – Acceptable Menu Text/Icons for Weights Measures information

Permitted Menu Text examples	Permitted Icon shape examples	Essential characteristics
Information Info		Top level menu text or icon Icon text is a lower case "i" with block serifs Text color may be light or dark but must contrast with the background color Icon may have a circular border Activation of this menu text/icon may invoke a second level menu text/icon that recalls metrology information.
Help **?**		Top level menu text or icon Icon text is a question mark Text color may be light or dark but must contrast with the background color Icon may have a circular border Activation of this menu text/icon may invoke a second level menu text/icon that recalls metrology information.
Metrology Metrological Information		Top or second level menu text or icon Icon text is an upper case "M" Text color may be light or dark but must contrast with the background color Icon may have a circular, rectangular, or rounded rectangle border. If present, the activation of this menu text/icon must recall at a minimum the NTEP CC number.
NTEP Data N.T.E.P. Certificate		This one is debatable – what if the certificate is revoked? Does NTEP grant holders of CCs the right to display the logo on the device, or just in documentation?
Weights & Measures Info		

Appendix B – NIST WMD Report on International Activity

OIML Document D31:

US National Working Group consists of:
Katya Delak
Jim Pettinato
Teri Gulke
Jan Konijnenburg
Joe Porthouse
Todd Gray