**NIST U.S. National Work Group**

**Measuring Systems for Electric Vehicle Fueling and Submetering**

**January 15-17, 2013 Meeting**

**Meeting Summary**

Purpose: The NIST U.S. National Work Group (USNWG) on Measuring Systems for Electric Vehicle Fueling and Submetering (EVF&S) was formed to develop proposed requirements for commercial electrical energy-measuring devices (including those used to measure and sell electrical energy commercially delivered as vehicle fuel and those used in submetering electrical energy at residential and business locations) and to ensure that the prescribed methodologies and standards facilitate measurements that are traceable to the International System of Units (SI). This work is not intended to address utility metering in the home or business where the electrical energy meter is used by a public utility in connection with measuring electrical energy subject to the jurisdiction of a Public Utilities Commission or other municipality.

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| **Glossary of Acronyms** | | | |
| CFR | Code of Federal Regulations | MOS | Method of Sale |
| EVF&S | Electric Vehicle Fueling and Submetering | NCWM | National Conference on Weights and Measures |
| EVSE | Electric Vehicle Supply Equipment | NEC | National Electrical Code |
| HB 44 | NIST Handbook 44 *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices* | NIST | National Institute of Standards and Technology |
| HB 130 | NIST Handbook 130 *Uniform Laws and Regulations in the Area of Legal Metrology and Engine Fuel Quality* | OWM | Office of Weights and Measures |
| kW | Kilowatt | PEV | Plug-in Electric Vehicle |
| kW·h | Kilowatt hour | SI | International System of Units |
| L&R | NCWM Laws and Regulations Committee | USNWG | U.S. National Work Group |
| This table is meant to assist the reader in the identification of acronyms used in this document and does not imply that these terms are used solely to identify these organizations or technical topics. | | | |

|  |  |  |
| --- | --- | --- |
| **Attachment No.** | **Agenda Item** | **Attachments** |
| **1** | **1** | **USNWG Team Roster** |
| **2** | **2** | **Summary of the August 29, 2012 USNWG Meeting** |
| **3** | **3** | **USNWG Draft Operational Guidelines** |
| **4** | **3** | **USNWG Draft Agenda Submission Form** |
| **5** | **4 & 5** | **USNWG Combined Comments on Draft Documents** |
| **6** | **4** | **Draft NIST Handbook 130 Method of Sale for Electrical Energy Sold as Vehicle Fuel** |
| **7** | **5** | **Draft NIST Handbook 44 System Code Requirements for Electric Vehicle Fueling and Submetering** |

**Agenda Topics**

## 1. Welcome, Introductions, and Standards Process Overview

### 1.a. Welcome and Introductions

The NIST Office of Weights and Measures Chief, Ms. Carol Hockert, welcomed the USNWG to NIST and expressed her support for the goals of the USNWG. USNWG members were welcomed to the meeting by the Chair, Ms. Juana Williams and the Technical Advisor, Mr. Marc Buttler, after which the Chair called the meeting to order.

The individual members of the USNWG attending in person and via web conference introduced themselves and explained their interest in the USNWG. There were a total of 39 attendees; 21 in person and 18 online.

| **Attendees In Person** | **Attendees Online** |
| --- | --- |
| **Steve Brown**  Underwriter’s Laboratory | **Dave Baxter**  ChargePoint |
| **Ted Bohn**  Argonne National Laboratory | **Jimmy Cassidy**  Cambridge, MA Weights & Measures |
| **Tina Butcher**  NIST OWM | **Mike Coop**  ThinkSmartGrid |
| **Larry Butkovich**  Fuji Electric Corp. of America | **Matthew Curran**  Florida Dept. of Agriculture and Consumer Services |
| **Marc Buttler**  NIST OWM | **Max Gray** (for Matthew Curran)  Florida Dept. of Agriculture and Consumer Services |
| **Steve Cook**  California Division of Measurement Standards | **Viktor Gruber** (guest) |
| **Michael Krauthamer**  NRG EV Services - eVgo | **Ron Hasemeyer**  Alameda County Dept. of Weights and Measures |
| **Jim LeClare**  Maxim Integrated | **Kristin Macey**  California Division of Measurement Standards |
| **Diane Lee** (guest)  NIST OWM | **Eric Morabito**  New York State Dept. of Weights and Measures |
| **Richard Lowenthal**  ChargePoint | **Sandra Pinto de Bader**  Seattle office of Sustainability and Environment |
| **Jeff Mazer**  NIST | **Aamir Shaikh** (for Mike Roach)  Verifone, Inc. |
| **Don McComas**  Eaton Corp. | **Paul Stith**  Sustainable Unlimited Mobility (SUM) |
| **Hugh McDermott**  Better Place | **Kostas Tolios**  DTE Energy |
| **Andrei Moldoveanu**  National Electrical Manufacturer’s Association (NEMA) | **Stan Toy**  Santa Clara County Weights and Measures |
| **Tim Morgan**  Duke Energy | **Xiaopeng Wang**  Delta Products Corp. |
| **Tom Nelson**  NIST | **Lisa Warfield**  NIST OWM |
| **Steve Rosenstock**  Edison Electric Institute | **Brent Warr**  Idaho National Laboratory |
| **Ambler Thompson**  NIST | **Yuan Wu**  Delta Products Corp. |
| **Vinu Varghese**  Eaton Corp. |  |
| **Fred Wagner**  Energetics, Inc. (Idaho National Laboratory) |  |
| **Derrik Weeks**  Eaton Corp. |  |
| **Juana Williams**  NIST OWM |  |

The Technical Advisor received one update correcting the USNWG team roster, Attachment 1, during the meeting.

*Technical Advisor’s Note: Several updates to the roster that have occurred since the meeting appear in the latest version of the USNWG team roster, Attachment 1, including three new members and three changes in membership status between O-members and P-members.*

### 1.b. Weights and Measures Standards Development Process Review

**Discussion:** The Chair and the Technical Advisor gave a brief explanation of the U.S. Weights and Measures standards development process for the benefit of those USNWG members who were not familiar with the process. NIST is a non-regulatory agency of the U.S. Department of Commerce. All implementation and enforcement of weights and measures laws and regulations takes place at the State and local level. NIST works cooperatively with State and local jurisdictions to establish national uniformity in weights and measures requirements and practices.

NIST publishes Handbook 130 *Uniform Laws and Regulations in the Area of Legal Metrology and Engine Fuel Quality* (HB 130) and Handbook 44 *Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices* (HB 44) to promote uniform weights and measures standards across the U.S. States adopt NIST Handbook 44 and NIST HB 130, either by reference or as a basis for State laws and regulations. A summary of the Status of Promulgation for each state can be found in Section II. Uniformity of Laws and Regulations in HB 130.

The model laws, regulations, and requirements that comprise the contents within HB 130 and HB 44 are adopted by the National Conference on Weights and Measures (NCWM). The NCWM is the venue established in 1905 by NIST whereby weights and measures standards are developed and adopted into NIST Handbook 44 and NIST Handbook 130. A full description of the process whereby amendments and additions to HB 130 and HB 44 are submitted, developed, and adopted can be found in the Introduction Section of each of these publications.

The NCWM National Type Evaluation Program (NTEP) evaluates commercial weighing and measuring systems to verify their compliance with the requirements in NIST Handbook 44. Most jurisdictions in the U.S. require devices that are used in commercial applications to have a NTEP Certificate of Conformance (NTEP CC). The USNWG reviewed examples of NTEP CCs in order to understand the scope and depth of information about an approved device type that is included on a CC.

The USNWG will develop HB130 and HB 44 proposals to submit to the NCWM to address electric vehicle fueling and submetering applications. Proposals and recommendations of the USNWG will be presented as the consensus of the USNWG and not as the individual position of any specific USNWG members. Participation in the USNWG does not in any way constrain the ability of individual members to independently submit comments and/or proposals to the NCWM.

History has shown that when products are introduced into the marketplace without the existence of a legally defined standard, confusion and unfair competitive practices can quickly evolve and potentially harm the consumer’s perception of the product and the business reputations of the sellers. When commercial applications arise that do not have the benefit of nationally recognized uniform standards, State and local jurisdictions are often forced to independently develop and enforce weights and measures requirements for the application until nationally recognized uniform standards do become available. The main benefit for all stakeholders that results when uniform weights and measures standards are adopted by the NCWM is a healthy economic environment wherein consumers and business are protected by transparency in commerce, and where businesses can rely on the security of a level playing field to compete on that is founded on fair, consistent, and uniform standards.

## 2. Summary of the August 29, 2012 USNWG EVF&S Meeting

**Background:** The first meeting of the USNWG was held on August 29, 2012. A draft of the Summary of that meeting was circulated to USNWG members on November 6, 2012 for review.

**Recommendation:** USNWG members were asked to approve the Summary of the August 29, 2012 meeting, Attachment 2.

**Decision:** Members approved the Summary of the August 29, 2012 meeting with no changes.

## 3. USNWG Guidelines and Agenda Submission Form

**Background/Discussion:** USNWG members were given draft copies of the USNWG Operational Guidelines and Agenda Submission Form (as shown in Attachments 3 and 4) during the meeting. The Technical Advisor explained that the proposed Guidelines are intended to document how the USNWG will function. The Guidelines include such information as the overall objective of the Work Group and ground rules for membership, meetings, voting, submitting agenda items, and technical subcommittees. The purpose of the Agenda Submission Form is to be used by members when submitting agenda items for the USNWG to consider.

**Recommendation:** USNWG members were asked to review the USNWG Operational Guidelines and the Agenda Submission Form before the next USNWG meeting.

**Decision:** The USNWG agreed to review the USNWG Operational Guidelines as shown in Attachment 3 and the Agenda Submission Form as shown in Attachment 4, and to submit comments on these drafts to the Technical Advisor. USNWG members will be asked to approve these two documents at the next meeting.

## 4. NIST Handbook 130 Method of Sale for Electrical Energy Sold as Vehicle Fuel

**Background:** A draft proposal for the HB 130 Method of Sale for Electrical Energy Sold as Vehicle Fuel was distributed to USNWG members on November 29, 2012. USNWG were asked to submit comments to the Technical Advisor by January 8, 2013.

The Technical Advisor distributed the table shown in Attachment 5, which lists USNWG member comments on the draft HB 130 MOS proposal along with corresponding responses prepared by the Technical Advisor.

**Recommendation:** The Technical Advisor distributed an updated version of the HB 130 MOS proposal (as shown in Attachment 6), which had been revised to reflect USNWG member comments. The USNWG was asked to review and approve the revised draft.

**Decision:** The USNWG acknowledged that agreement on a proposed HB 130 MOS is needed prior to proceeding with further development of corresponding device standards for HB 44. Consequently, the bulk of the meeting was spent reviewing various sections of the HB 130 MOS proposal and associated key points as outlined in the following subsections.

### 4.a. Paragraph 2.XX.1. Definitions

**Discussion:** The USNWG discussed comments received on the proposed new definitions in paragraph 2.XX.1 of the draft HB 130 MOS proposal.

The USNWG concluded that the length of time that it takes to charge the vehicle is one of the key components used by customers to make value comparisons between PEV fueling stations. The USNWG discussed analogies to the value comparisons made among variables in other types of vehicle fuels.

* Gasoline is offered with different octane ratings, providing customers with a choice among fuels that are suited for vehicles designed with different engine compression settings for varying performance.
* Gaseous hydrogen fuel is offered at different working pressures (e.g., H35, H70), providing customers with a choice from among fueling pressures that will give their fuel cell vehicle varying fueling times and distance between fueling stops.
* Ethanol blended fuels (e.g., E15, E85) are offered with different percentages of ethanol, providing customers with a choice from among fuels that will give their flex-fuel vehicles varying mileage.

These analogies help to illustrate the importance of standardized terminology for station, street, and other advertising to communicate in clear and consistent terms with customers on factors like fuel octane ratings, fill pressure options, ethanol content of blended fuels, and charging speeds that are critical for them to make value comparisons between fuel purchase options. Defining terms to clearly communicate charging speed in the HB 130 MOS proposal will promote a level playing field, avoid customer confusion, and discourage deceptive business practices.

Comments on the proposed definitions for “Level 1,” “Level 2,” and “Level 3” type EVSEs (paragraphs 2.XX.1.3., 2.XX.1.4., and 2.XX.1.5.) were discussed. The USNWG debated whether or not the terminology used to communicate to the customer how much time it will take to charge should be addressed by weights and measures jurisdictions. The primary need for these terms to be defined in the HB 130 MOS proposal is based on the fact that the time that it takes to charge a PEV can vary dramatically from one type of EVSE system to another, such that it becomes a significant factor in a value comparison for the customer.

To define standard terms for communicating the speed of charging to customers, the USNWG considered the two questions listed below:

* **Is it reasonable to expect that two different prices might be justified for the same quantity of electrical energy sold by EVSEs located side-by-side because one of the EVSEs is capable of charging the vehicle significantly faster than the adjacent EVSE?**
* **Is there a verifiable characteristic of a device that can be used to consistently and clearly communicate the speed at which the device is capable of transferring electrical energy?**

The USNWG agreed that it was entirely likely and reasonable to expect that a customer would value the option to compare the speed at which an EVSE can charge a PEV. In many cases, consumers would choose to pay a higher price for the same amount of electrical energy if they knew that it would be transferred to their PEV significantly faster. For example, a PEV can typically travel 40 to 50 miles with 16 kW·h of electrical energy, which is often more than sufficient to reach their destination. 16 kW·h of electrical energy can be delivered by a fast-charging system with a 50 kW power rating in approximately 20 minutes. A customer who is pausing for electrical energy on his way to another destination is likely to choose this option, even at a reasonably higher price, over a system with a 3 kW rating (that might be installed next to it), which would require 5.5 hours to deliver the same 16 kW·h of electrical energy.

The USNWG recognized that various segments in the PEV refueling infrastructure need to use EVSE level designation terminology for many different reasons. The USNWG generally agreed that EVSE level designations are currently the de facto indicator that people use when comparing PEV charging speed options among competing EVSEs. When the USNWG examined the design of various systems, it became clear that, although systems of the same EVSE level designation are equipped with similar features, this does not always equate to similar charging speed capability. Consequently, “EVSE level designation” does not appear to provide consumers with a reliable means to make comparisons among available systems’ charging speeds.

The USNWG identified two main reasons why the EVSE level designation is not the best option for determining a system’s charging speed capability.

First, there are simply too many variables that can impact the speed of charging that are not reflected by the EVSE level designation. Devices are designed to regulate the current within NEC standards, but the same device might be installed with different supply voltage (e.g., 208 V, 240 V), which would have an effect on charging speed. Different devices that fall into the same EVSE level designation might have different power ratings and impedance, yet still be considered to be in the same “level.” Some devices may be installed in conjunction with load management systems that can be used to manually control the speed of charging.

Second, industry is creating and adding new EVSE AC and DC level designations that may have charging speeds that overlap with the range of speeds of already existing EVSE level designations. For example, a “DC Level 1” device installation with nominal power of 16 to 20 kW would not charge any faster or slower than an “AC Level 2” device with similar nominal power capability. The mistaken idea that all DC chargers are faster than AC chargers will become even less valid with the expected entry into the market of DC devices that have a nominal power rating as low as 5 kW.

Ultimately, the USNWG recognized that EVSE level designations will not serve in the long-term as a means for customers to make value comparisons based on PEV charging speed. The expected proliferation of new EVSE level designations that will overlap in charging speed will only confuse value comparisons by customers in the future.

The USNWG identified the power of a system as a much more definitive way to indicate the capability of the device for faster electrical energy delivery. Power in kW units is equal to the rate of transfer of electrical energy in units of one kW·h of energy per hour (i.e., 1 kW·h ÷ 1 hour = 1 kW). Industry presently uses voltage and current ratings to market equipment; power is the single value that represents the product of both voltage and current together. Power rating is also one of the features that are required to be identified on an EVSE by the Federal Trade Commission (FTC). 16 CFR, Part 309 is mentioned in paragraph 2.XX.3.(e) of the HB 130 MOS proposal. The USNWG reviewed the fuel rating information that is required to appear on electric vehicle fuel dispensing systems in FTC 16 CFR Ch.1 Part 309 .15 ***Posting of non-liquid alternative vehicle fuel rating*:**

*(2) For electric vehicle fuel dispensing systems, a common identifier (such as, but not limited to, “electricity,” “electric charging system,” “electric charging station”) with a disclosure of the system’s kilowatt (“kW”) capacity, voltage, whether the voltage is alternating current (“ac”) or direct current (“dc”), amperage, and whether the system is conductive or inductive.*

The USNWG agreed that there is a need to define the “nominal power” of an EVSE device or system as the “intended” or “named” or “stated” power, in contrast to the “actual power.” In today’s landscape, typical nominal power values include: 1.3 kW, 3 kW, 6 kW, 20 kW, and 50 kW. It is expected that customers will quickly learn how to relate nominal power to charging speed. Although the USNWG recognized that there are other factors outside of the control of the EVSE owner that can slow down rate of delivery (e.g., vehicle impedance), the USNWG agreed that the above definition of “nominal power,” which the USNWG developed for the HB 130 MOS proposal, is the most definitive way to convey the charging speed of a system.

The USNWG considered other alternatives to the nominal power for the purpose of conveying the charging speed capability of a system. “Actual” power was found to be impractical because it is dynamic and subject to the influence of factors that are not under the control of the EVSE owner (e.g., vehicle design, controls within the vehicle, local (i.e. station) load management systems, external grid conditions). The range between the minimum and maximum power possible in the installation was also rejected as an alternative to the nominal power because it is not clear that the wide ranges that would likely be represented would be meaningful for a value comparison. Furthermore, the minimum power would be difficult to characterize in a meaningful way because it can be affected by very small variations in the installation conditions.

*Technical Advisor’s Note: The USNWG’s goal is to harmonize with corresponding U.S. and international standards whenever possible. The Chair of the SAE J1772 committee, Mr. Gery Kissel, shared the following thoughts in response to learning of the USNWG recommendation to change from EVSE level designations to power rating for the purpose of communicating charging speed****:***

*“I have not been part of this group and don't understand what the repercussions can be, but your proposal seems to be reasonable.*

*The levels are very broad and would only be able to communicate the maximum energy transfer for a particular level. For example, while there are many AC Level 2 EVSEs, few are rated for the max 80 amps. Most are 30 or 32 amp. So, maximum power for a particular EVSE would more accurately communicate the time needed to recharge.*

*An issue with this approach is that, even if a person knows the capability of the EVSE, the vehicle may limit the charge time. Essentially there are two funnels in the system, the EVSE capability and the vehicle charger capability.”*

The USNWG requested input from Ms. Lisa Warfield, the NIST Technical Advisor to the NCWM L&R Committee, to determine if “nominal” and “power” should be defined separately and if the existing definition for “nominal” should be copied to HB 130 from HB 44 Appendix D. Definitions. Ms. Warfield advised the USNWG not to alter the definition for “nominal power” that the USNWG had developed and not to copy the definition of “nominal” from HB 44 to HB 130 because the definition for the complete term “nominal power” in HB 130 should remain in the HB 130 MOS section that specifically applies to electrical energy sold as vehicle fuel.

The USNWG discussed the question of how the nominal power could be verified by weights and measures officials. A suggestion was made that it may be possible to address this at type approval, even though there are installation considerations. A National Type Evaluation Program Certificate of Conformance (NTEP CC) could include information that would identify the correct nominal power ratings for a range of installation variables. An inspector would only need to ascertain the details of the installation (e.g., supply voltage) and then look up the corresponding nominal power rating from the NTEP CC. It might also be possible to specify a test in HB 44 that would prescribe a phantom load value and tolerance limit for the observed power that could be used to verify the posted nominal power. The USNWG might consider developing this type of test procedure when it begins work on the draft HB 44 Tentative Code proposal and Examination Procedure Outline (EPO).

The USNWG considered another potentially significant issue in the charging speed component of the value comparison: variable versus fixed service (i.e., flow of electrical energy from the EVSE to the PEV). The UWNSG defined “fixed service” as “service that continuously provides the nominal power that is possible with the equipment as it is installed.” The USNWG defined “variable service” as “service that may be controlled resulting in periods of reduced, and/or interrupted transfer of electrical energy.” Together, these two definitions are intended to provide additional critical information about the charging speed of the system to the customer. The USNWG agreed it will be important for the HB 130 MOS proposal to include these definitions.

Variable service might be offered in some locations to keep overall electricity consumption costs down and to enable management of energy resources. In locations that predominantly offer “variable service,” the system owner may choose to designate a few select devices at the location that will provide “fixed service” at a premium price. The USNWG agreed that it is reasonable to expect that two different prices might be justified for the same quantity of electrical energy sold by EVSEs located side‑by‑side because the EVSE with “fixed service” is capable of charging the vehicle significantly faster and more consistently than the adjacent EVSE with “variable service.”

Because a substantial percentage of installations may offer customers variable service that could dramatically alter the overall average speed at which the vehicle is charged, it was deemed important to convey to customers both the nominal power and the service type (either fixed or variable) to ensure value comparisons were not confounded by unawareness that service might be variable in some locations.

**Decisions:**

The USNWG agreed that the definition for “Electrical energy sold as vehicle fuel” in paragraph 2.XX.1.1. does not require any changes.

The USNWG agreed that the definition for “Electric vehicle supply equipment (EVSE)” in paragraph 2.XX.1.2. should align as closely as possible with the definition for this term from NEC 625.2. However, the USNWG also agreed that additional acknowledgement of the measuring, delivering, and price computing capabilities of commercial devices needed to be added for this context.

The USNWG agreed to eliminate the definitions for “Level 1,” “Level 2,” and “Level 3” type EVSEs (paragraphs 2.XX.1.3., 2.XX.1.4., and 2.XX.1.5.) and replace them with the definitions for “fixed service,” “variable service,” and “nominal power” because these terms are better suited for communicating charging speed value to customers. The USNWG finalized and approved the language of these three new definitions and added them to the proposal as paragraphs 2.XX.1.3., 2.XX.1.4., and 2.XX.1.5., respectively.

The USNWG agreed to use the term “electrical energy” for clarity throughout the HB 130 MOS proposal, in lieu of “electricity” or “energy.”

### 4.b. Paragraph 2.XX.2. Method of Retail Sale

**Discussion:** The USNWG discussed proposed new HB 130 paragraph **2.XX.2. Method of Retail Sale.**, which specifically defines the unit of measure for the MOS. The Chair reviewed **NIST Handbook 44 General Code Paragraph G-A.1. Commercial and Law Enforcement Equipment** to lay a foundation for the discussion, emphasizing that HB 130 and HB 44 requirements apply only to commercial devices and law enforcement equipment.

The USNWG agreed on units of either the kilowatt hour (kW·h) or the SI unit of the megajoule (MJ) for the commercial measurement of electrical energy as vehicle fuel. The USNWG agreed that elapsed time is not a viable alternative to kW·h or MJ measurement as the basis for determining how much electrical energy a customer received. There are too many variables that impact the rate of transfer of energy for there to be any predictable relationship between time elapsed and energy transferred. In fact, without a measurement of the kW·h or MJ, there is no way to even verify that a customer received any electrical energy during a period of connection to an EVSE.

PEV fueling is typically offered in conjunction with other services, most commonly parking, because of the extended period of time that may be required for fueling with systems that provide slower rates of delivery. Another service that is commonly associated with PEV fueling equipment is that of reserving the equipment in advance, so that the EVSE is available when the vehicle arrives. Because associated services are expected to be the norm, the USNWG agreed that it is appropriate to recognize in the HB 130 MOS proposal that fees may be assessed for additional services in conjunction with the sale of electrical energy and that the fees for these services may be based on the measurement of elapsed time or on a fixed fee.

Another reason to include fees that are associated with additional services in paragraph 2.XX.2. is to help stress the critical difference between these fees and the fees for the sale of the electrical energy. It has been questioned whether the electrical energy needs to be measured at all in cases where the fee for the energy is only a small fraction of the overall total price of the transaction compared to the fees for additional services. The HB 130 MOS proposal is intended to make clear that any representation of the sale of electrical energy as vehicle fuel shall include a measurement of the amount of electrical energy delivered in units of either kW·h or MJ. This is important because the anticipated unit price of electrical energy today does not guarantee that electrical energy unit prices will not change in the future. By making clear that additional fees are separate from the fees for the electrical energy, it will make clear that the electrical energy measurement is always required, regardless of what fraction of the total fees are attributable to the electrical energy purchase and what fraction are attributable to the time‑based service.

The USNWG discussed an example of how fees for additional services might be assessed. The hypothetical scenario involved a parking garage which offers two side-by-side parking spaces at two different hourly rates or two different fixed fees. The difference in the rate is because one of the spaces includes a connection to an EVSE that delivers electrical energy for free. In reality, this situation would arguably be an attempt to avoid having to measure the electrical energy by selling it in units of time. The actual price for the electrical energy could be construed as the increased price of that parking space over the price for the neighboring spot that has no charging capability. The same scenario can be broadened to include two competing parking garages across the street from one another. If one garage offers free electrical energy with the parking, but charges a premium for parking over their competition, they are arguably selling the electrical energy by units of time. How is the customer going to compare the cost of the electrical energy without a unit price based on kW·h or MJ, or without a measurement of the electrical energy they receive for their money in units of kW·h or MJ.

The USNWG began to construct a list as shown in the table below of different examples of how and where electrical energy might be offered for sale. This exercise was intended to help illustrate how the method by which charges are being assessed can affect a customer’s ability to make value comparisons among various options for fueling a PEV.

|  |  |  |
| --- | --- | --- |
| Commercial Use Cases | | |
| Locations | W/O EVSE | W/EVSE includes |
| Parking/Garage | $ for Time – Flat Fee - Free | $ for Energy\*, Free energy, $ for Time or flat fee for using EVSE (any meter data is used by property owner, third properties, etc.), |
| Work/Employer | Free – Flat/monthly fee | $ for Time, Authenticate users for reserved spots (e.g., IGO car sharing), $ for Energy\* (W-2 perk or back out of pay may be exempt), $ for subscription (unlimited access) |
| Retail Store |  |  |
| Airport – Long Term |  |  |
| Airport – Short Term (12 hr. max) |  |  |
| Roadside Station (while you wait) |  |  |
| Hotel |  |  |
| Home |  |  |
| Apartment Building |  |  |
| Street side |  |  |
| Mileage  (self-reporting to car telematics) |  |  |
| One time use | NA | Session flat fee |

\* Several USNWG members indicated that this practice is currently prohibited in most State jurisdictions. Therefore, businesses offering vehicle charging in these jurisdictions must sell electrical energy by assessing a fee based on the length of time that the EVSE was in use.

Another concern of allowing the sale of electrical energy in units of time is that this can lead to facilitation of fraud. Consider the circumstances if the premium-priced garage in the previous example is also employing an energy load management system that can manually increase or decrease the rate of flow of electrical energy to any and all the cars in the garage. Because they are not charging any fee for the electrical energy itself and because there is no measurement of the actual electrical energy delivered, the garage may feel justified in reducing their own utility costs during winter months by using the load management system to turn down the flow of electrical energy to their customers’ vehicles by 10%. However, it is reasonable to assume that the customers have made a value comparison between the competing PEV fueling providers based on: (1) the representation by the premium‑priced garage that they will receive free electrical energy; and (2) based on their expectations that may have been formed during past experiences before the garage decreased the flow by 10% of how much free electrical energy they will receive.

Contract (subscription) service must also measure electrical energy as it is delivered or the customer has no basis for value comparison. For example, a customer may decide to use a publicly available station that is outside the contract system to charge a vehicle, but some members commented that they would have no way to compare the value of that purchase to their contract purchases unless they have some knowledge of how much electrical energy (e.g., how many kW·h) they are receiving in exchange for the monthly fee they pay. Similarly, contract agreements that offer different rate plans that depend on usage thresholds must meet weights and measures requirements when making commercial measurements to determine if a customer has exceeded the allowance for their plan. Often, weights and measures officials have jurisdiction and respond if there is a complaint about the accuracy of measurement. One provider shared that their subscriber service offers many different rate plans.

Systems that provide energy to vehicles by exchanging the battery for one that is freshly charged were discussed. One question raised was whether a customer could receive credit for the electrical energy that was remaining in the battery that was removed. One contract service provider offers a solution by assessing fees based on the mileage that the customer drives each month. Weights and measures officials asked how the odometer on a privately owned vehicle could be accessed for inspection by officials. It was noted that tire size and inflation changes could influence the accuracy of an odometer reading. Several commercial odometer applications were discussed.

A concern was raised that some states prohibit the retail sale of electrical energy by third parties and unregulated providers. One provider alleged that the following rule is employed by some states to ensure that a provider is not illegally selling electrical energy:

*If the fees are the same for the transaction whether the customer received some energy or received zero energy, then the application does not violate the prohibition of retail electricity sale and is allowed.*

In jurisdictions where the retail sale of electrical energy is prohibited, providers claim that they are forced to charge for a service and cannot legally measure the quantity of electrical energy received by the customer, or, if they do, they must charge a unit price of $0.00 for the electrical energy. In jurisdictions where it is prohibited to measure the electrical energy delivered or the unit price is artificially forced to be $0.00, the customers are unable to readily make value comparisons. Consider the case of two side-by-side parking spots where there is a different rate per hour to park in either spot that depends on whether the spot has an EVSE or not. How can a customer justify the extra cost of the more expensive spot with the EVSE if there is no guarantee that he/she will receive any electrical energy? Of particular concern is that there is not any way to verify later that he/she actually did receive some electrical energy and how much energy was received while parked there?

The USNWG discussed comments that proposed eliminating megajoules (MJ) from the HB 130 MOS and leaving kilowatt hours (kW·h) as the sole unit of measure. The Technical Advisor explained that it is NIST policy to consistently promote the use of the SI system. U.S. law encourages the SI system, but does not make its use mandatory. The USNWG debated whether or not kilowatt hours (kW·h) is, in fact, an SI unit. The Technical Advisor pointed out that megajoules (MJ) and kilowatts (kW) are both recognized as SI Coherent Units, but that hours (h) are a non-SI unit. Since kilowatt hours (kW·h) is comprised of both hours (h) and kilowatts (kW), kilowatt hours (kW·h) is technically a non-SI unit.

*Technical Advisor’s Note: An investigation following the meeting of the CIML Ballot Draft Recommendation of OIML R46 Active Electrical Energy Meters found that the R46 draft refers exclusively to kW·h and other W·h derivations. It does not mention MJ. However, NIST policy requires that NIST publications will not inhibit the use of SI units, and, therefore, MJ must be included in the HB 130 MOS proposal to ensure compliance with NIST policy.*

*The NIST Metric Policy Specialist and Special Publication 811 Guide for the Use of the International System of Units (SI) were consulted following the meeting and it was determined that the format which includes a half-high dot between kW and h to signify multiplication of the two units (i.e., kW·h) is the preferred format and should always be used when kW·h appears in any official document.*

**Decision:** The USNWG agreed to propose the measurement of electrical energy in kilowatt hours (kW·h) or megajoules (MJ) as the HB 130 Method of Retail Sale for Electrical Energy Sold as Vehicle Fuel. The USNWG agreed to also include the statement that time-based fees and fixed fees may be charged for services sold during fueling *in addition* to the sale of the electrical energy.

### 4.c. Metering Electrical Energy

**Discussion:** Members of the USNWG asked if the proposed HB 130 MOS would require every EVSE device to have an electrical energy meter. HB 130 defines how a particular commodity is to be sold (e.g., a method of sale). If the MOS requires sales based on a measured quantity, then an EVSE that is used “commercially” (i.e., in the sale of electrical energy) would be required to include a means to meter the electrical energy. EVSEs that are not used to conduct commercial transactions would not be subject to the requirements in HB 130 or HB 44. Requirements for measuring elements and systems that will be used in commercial measurements for PEV fueling will be placed in the HB 44 Tentative Code proposal.

USNWG members expect that the majority of EVSEs (both commercial and non-commercial) will have meters of some type, but that “revenue grade” meters will only be found in EVSEs used for commercial applications where they are required. Members predict that many EVSEs will be in operation exclusively to serve large PEV fleets owned by the company that owns the EVSE. They predict these EVSEs will still use meters for internal accounting, tracking, and allocation of energy usage, but that these meters will be “sub-revenue grade” meters since they will not be used to sell electrical energy.

Weights and measures standards are not intended as prescriptive design standards. Weights and measures requirements are in place to ensure each transaction is fair, transparent, and accurate. Meters used in commercial EVSEs must meet basic nationally recognized metering equipment standards (e.g., ANSI C12) in order to satisfy general regulatory requirements, standards for metrology, and safety standards that are in place for all electrical metering equipment. The draft HB 44 Tentative Code proposal will include a requirement that references the minimum general electrical metering equipment standard(s) that are expected to be met in addition to the requirements for commercial applications.

EVSE manufacturers recognize a need for basic metering standards beyond those that currently exist for utility‑type metering. They claim the standards for utility-type revenue grade meters are not optimized for EVSE applications and the projected future volume demand for EVSEs. The form factor, testing, certification, and other aspects of meters that are proposed for some EVSE designs are not yet confirmed to be in compliance with any recognized standards. EVSE manufacturers predict that EVSEs will eventually outnumber PEVs. One manufacturer claims to have already shipped over 13 000 meters. The State of California planners project 70 000 level 2 EVSEs and 8 000 to 12 000 DC fast charging EVSEs installed by 2020. Manufactures argue that it is difficult to justify the cost of a traditional revenue-grade meter in an EVSE because an EVSE is not in continuous use like a liquid-fuel dispenser.

Metering devices in in-home EVSEs may be subject to either Public Utility Commission (PUC) or weights and measures requirements. Those in-home installations that fall under the jurisdiction of a PUC will need to meet certain requirements (e.g., Automated Data Exchange (ADE), communications) because they impact utility company billing. In-home submeters that are not under the jurisdiction of a PUC, but do come under weights and measures jurisdiction will need to meet weights and measures requirements (e.g., indication, accuracy, sealing, accessibility for inspection) as will be outlined in HB 44 or a similar local standard. The USNWG concluded that it will be important for the USNWG to maintain communication with other groups (e.g., California PUC, California Investor-Owned Utilities, American National Standards Institute, National Electrical Manufacturer’s Association, Smart Grid Interoperability Panel) that are developing metering standards for EVSEs that fall under the jurisdiction of Public Utility Commissions.

### 4.d. Point of Transfer/Line of Demarcation

**Discussion:** The USNWG considered how weights and measures standards should define the physical point (also referred to as the “line of demarcation”) where the transfer of the ownership of the electrical energy occurs. The designated point of transfer has the potential to impact device designs, measurement corrections, and testing methods.

The point of transfer is important because electrical energy is lost and dissipated as heat whenever current flows through a circuit. The amount of the energy lost is proportional to the electrical resistance of the circuit and the current flow. In order to ensure that a customer receives the electrical energy they pay for, the energy he or she receives must equal the energy that is measured. If a system is designed with too much electrical resistance between the electrical energy meter and the transfer point, then the system will lose some of the energy that is measured and ultimately paid for by the customer before it reaches the customer. Most of the losses would occur in the cord or cable that connects the EVSE to the vehicle. One estimate is that as much as 60 W could be lost in the cord. In an EVSE delivery that has a rate of transfer of 6 kW, 60W of losses would amount to 1% of the measured value, which uses up as much as half of the proposed maintenance tolerance for these devices.

Some EVSE manufacturers expressed the opinion that the point of transfer/demarcation would be appropriately defined as the point where the equipment owned by the vehicle owner connects with the equipment owned by the station owner. If the point of transfer is at the connection to the vehicle, then the EVSE manufacturer has the flexibility to either minimize losses by ensuring that the electrical resistance in the device is low enough to keep losses within prescribed limits or to apply a correction(s) to the measurement based on the system design and the measurement of the current flow.

The point of transfer/demarcation is best determined by the way the tests are defined in the “Notes” section of the draft HB 44 Tentative Code proposal. The draft version does not yet specify where the point of connection is to be made for testing. If the Notes call for a test method that verifies the accuracy of the device by connecting a traceable reference standard to the device in the same way that a vehicle is connected to the device during normal use, then the test method will be able to verify the ability of the device to accurately represent the amount that is actually received by customers during normal use. If, however, the test method requires the reference standard to be connected to the meter inside an EVSE in a way that is unlike the normal usage, then the test method would not address the losses in the connecting cord without some supplemental test of the cord itself.

**Decision:** The USNWG determined that the point of transfer/demarcation issue must be addressed if electrical energy in units of kW·h or MJ are to be the method of sale specified in the HB 130 MOS proposal. The USNWG resolved to address the issue in the system requirements in the draft HB 44 Tentative Code proposal. The USNWG agreed to form a subcommittee to develop one of the approaches to address the issue that is based on the field test method. Further discussion on the subcommittee that was formed can be found under Item 5. Draft NIST Handbook 44 System Code Requirements for Electric Vehicle Fueling and Submetering.

### 4.e. Paragraph 2.XX.3. Retail Electric Vehicle Supply Equipment (EVSE) Labeling

**Discussion:** The USNWG discussed paragraph 2.XX.3. Retail Electric Vehicle Supply Equipment (EVSE) Labeling. Industry members pointed out that many EVSE designs do not provide much space for labels and recommended that the information that is required to appear on the device be carefully considered with this in mind.

The USNWG discussed a comment suggesting that systems should be allowed to display the unit price in whole cents or in tenths of one cent. The draft proposal was modified prior to the meeting to allow for either whole cents or tenths of one cent in response to this comment.

*Technical Advisor’s Note: Research following the meeting discovered that general policies in the Weights and Measures community are evolving to disallow the display of fractions of a cent for unit pricing and recent additions to HB 44 to recognize other alternative fuels have stipulated that unit prices be displayed in whole cents. No monetary unit with a cash value less than one cent exists which could be used to pay a fee that included a fraction of a cent and consumers have complained about this practice in other measuring areas. Provisions allowing for display of unit pricing with tenths of a cent may result in new proposals being rejected or delayed on those grounds. The Technical Advisor strongly recommends the USNWG reconsider this point and change the HB 130 MOS proposal such that only whole cent unit pricing is permitted.*

The USNWG discussed requirements for labeling to convey the nominal power and the service type (i.e., “fixed” or “variable”). The USNWG reviewed the figures below as examples of labels that meet FTC requirements for various types of vehicle fuel dispensing equipment, noting again that the system power capacity statement is required by FTC for electric vehicle fueling applications.

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**Decisions:** The term “user interface” was replaced in paragraph 2.XX.3. of the draft HB 130 MOS proposal with “face of the device” because the term could be misinterpreted as it applies to EVSE. Other standards relating to EVSEs may use the term “user interface” in reference to remote customer-owned devices (e.g., smart phones). Confusion could result from using a term that has a very different scope in other standards.

The USNWG agreed to add a provision to the proposal that EVSEs which provide free or unlimited electrical energy must be clearly labeled as such.

The USNWG developed the requirements for the information that is to be conveyed depending on whether the system provides “fixed” or “variable” service. The USNWG agreed that more information must be labeled on variable service installations because variable service includes potential interruptions in service that will reduce the average charging speed and will, thus, be of lesser value to customers than the greater certainty of charging speed that fixed service provides. Thus, variable service systems must be labeled with the word “variable” and the conditions under which variations in electrical energy transfer will occur. While equipment owners may opt to label an EVSE that provides fixed service as “fixed” in order to communicate the greater value of faster charging speed, it is not required.

Both types of service must label the nominal power and the type of transfer (e.g., AC, DC, wireless). Variable service has the additional requirement of labeling the minimum and maximum power that can occur during a transaction (including whether power can be reduced to zero).

The USNWG considered a suggestion to add a requirement to the HB 130 MOS proposal to require labeling of the type of connector on the device, since this information is needed a customer to determine if an EVSE is compatible with their vehicle. The USNWG agreed to defer the discussion of this suggestion until development of the HB 44 Code because the connector type and compatibility of equipment are more appropriately addressed as user requirements and belong in HB 44 under paragraph UR.3.1. Unit Price and Product Identity.

The USNWG also decided to defer the development of labeling requirements that would be needed for Vehicle to Grid (V2G) applications (i.e., the commercial measurement of reverse flow of electrical energy for credit). IEEE 1547 *Interconnecting Distributed Resources with Electric Power Systems*, which requires disconnection of any source to the grid under certain conditions must evolve further before commercial V2G can become a reality. NEC is also considering changes to the definition of EVSE as it relates to V2G. However, neither of these developments is expected to be addressed in 2013.

### 4.f. Paragraph 2.XX.4. Street Sign Prices and Other Advertisements

**Discussion:** The USNWG discussed HB 130 MOS proposal paragraph 2.XX.4. Street Sign Prices and Other Advertisements. The USNWG quickly concluded that advertising media other than street signs are used more predominantly now in EV fueling because customers rely heavily on online tools to locate, compare, select, and in some cases even reserve an EVSE before they are ever in the vicinity of the EVSE. Online advertising is “the new street sign” in the context of EV fueling because, in this early stage of the PEV market, customers make value comparisons remotely using online resources to decide where to drive for their next fueling, as compared to making value comparisons as they are passing stations that are on their normal driving route. The USNWG brainstormed a list of factors that customers may consider when deciding where to fuel. The list included: (1) availability, (2) reservation capability, (3) price, (4) equipment compatibility, and (5) location.

The USNWG Technical Advisor and Chair agreed to investigate whether there are requirements currently being developed elsewhere in the Weights and Measures community in the area of social media and online advertising that would directly apply to the work of the USNWG. Industry is concerned about whether service providers will be held responsible for crowd-sourced (e.g., populated by an online community) and other information that is outside of their control.

*Technical Advisor’s Note: The OWM Laws and Regulations Program Leader confirmed that there is currently no known activity in Weights and Measures standards development to develop requirements that would address online advertising. He confirmed that sellers are generally not held responsible for information that may be circulated about their business, but which is not under their control.*

Industry recommended that street signs be optional for EV fueling for two main reasons. First, online advertising is much more predominant than street signs in influencing customers’ value comparisons. However, this may change in the future as fueling opportunities become more commonplace and “range anxiety” (i.e., anxiety about being stranded without fuel) fades. Second, many installations for EVSE do not lend themselves to street signs. A string of curbside EVSEs that cover several city blocks was proposed as one example of an installation that may not be suitable for street signs. The Chair and Technical Advisor explained that the decision of whether street signs are required or not is usually made at the level of the local jurisdiction. The purpose of defining requirements for street sign format and content as part of a method of sale is to ensure that, when street signs are used, the format is consistent with requirements that are designed to prevent confusion and deceptive practices.

The USNWG discussed the need for paragraph 2.XX.4. (b) to address cases where more than one electrical energy unit price may apply over the duration of a single transaction. Because some PEV fueling transactions may last for many hours or even days, and because the electrical energy market results in different value for electricity at different times of day as demand varies dramatically, there may potentially be a need to be able to apply more than one unit price during different periods over the course of a single delivery.

**Decisions:** The USNWG agreed that, in cases where there is a street sign, the sign must include all fees including energy and additional fees.

The USNWG agreed that the conditions that would affect the unit price levels and durations of different unit price periods in these cases must be clearly represented to the customer in advance of a transaction. This can be done through a pre-established contract or by onsite signage or an EVSE display. Requirements will also need to be developed for recorded representations (i.e., receipts) and unit price indications to properly reflect what unit price is being applied or has been applied to which portions of the energy delivered and over what time periods once a transaction has been completed. The USNWG agreed that discussion of these requirements should take place as part of the development of the draft HB 44 Tentative Code proposal.

### 4.g. Status of the HB 130 MOS Proposal

**Recommendation:** The USNWG was asked to vote on whether or not to submit the proposal to the NCWM L&R Committee with a recommendation that it be considered as a voting item ready for adoption in July 2013.

**Decisions:** The USNWG agreed on final editorial changes to the HB 130 MOS proposal and agreed to submit the proposal to the NCWM L&R Committee with a recommendation that it be considered as a voting item ready for adoption in July 2013.

**Results of the vote (including one proxy vote):**

In favor: 12

Opposed: 1

Abstaining: 1

The draft USNWG Guidelines do not allow for a proxy vote. So, unless the USNWG decides to alter the Guidelines to allow voting by proxy before finalizing and approving them at the next meeting, future votes will not permit proxy votes.

The Technical Advisor will complete the final editorial changes that were agreed to in the January 2013 meeting and forward the finished product to the NCWM L&R Committee along with a recommendation that the proposal is ready for voting at the July 2013 NCWM Annual Meeting. The USNWG members will continue to vet the finished proposal and share any important information with the L&R Committee up until the Annual Meeting.

*Technical Advisor’s Note: The proposal and voting results were sent to the L&R Chair on January 23, 2013 for consideration during open hearings at the NCWM Interim meeting held Jan. 27-30, 2013. The L&R committee announced during the closing session that the developing item 270-2 would be a voting item at the NCWM Annual meeting to be held July 14-18, 2013 in Louisville, KY. The recommended deadline to ensure individual comments to the L&R committee are received in time to be considered during open hearings at the NCWM Annual Meeting is June 14, 2013. Positions may also be presented in person during the open hearings July 15-16, 2013. See* [*www.ncwm.net*](http://www.ncwm.net) *for more information on how to participate in the NCWM. The USNWG will develop a position statement and background information to be included in the record of the Annual Meeting.*

## 5. Draft NIST Handbook 44 System Code Requirements for Electric Vehicle Fueling and Submetering

**Background:** A draft HB 44 Tentative Code Requirements for Electric Vehicle Fueling and Submetering proposal was distributed to USNWG members on November 29, 2012. USNWG were asked to submit comments to the Technical Advisor by January 8, 2013.

The Technical Advisor distributed the table shown in Attachment 5, which lists USNWG member comments on the draft HB 44 Tentative Code proposal along with corresponding responses prepared by the Technical Advisor.

**Recommendation:** The Technical Advisor distributed an updated version of the draft HB 44 Tentative Code proposal (as shown in Attachment 7), which had been revised to reflect USNWG member comments. The USNWG was asked to review and approve the revised draft.

**Discussion:** The USNWG discussed a number of challenges to field inspection and testing of EVSE systems. Utility companies and at least one U.S. Weights and Measures jurisdiction have established test procedures and test equipment specifications for utility-type and submetering electrical energy metering applications. A system calibration or field verification test requires the use of a traceable reference standard. As discussed in Item 4.d. Point of Transfer/Line of Demarcation, the point where the test reference standard is connected to the EVSE during field testing will have an effect on the result because of the electrical energy losses in the system between the EVSE meter and the test connection point.

The question of whether or not weights and measures jurisdictions have the resources to inspect the large number of commercial EVSEs that are predicted was also raised. ANSI utility meter standards and California submeter inspection procedures employ sampling plans on lots of new meters to help manage a large number of devices. The USNWG agreed that a sampling plan might also be necessary for weight and measures jurisdictions. Some California county weights and measures jurisdictions manage the volume of submetering systems by inspecting and testing electric submeters on a ten year cycle, rather than a one year cycle.

**Decision:** The USNWG agreed that a means to access and connect to the system under test must be established to facilitate a safe and efficient test method that will be acceptable for field testing by weights and measures officials. To address this need, the USNWG agreed to form the EVSE Meter Test Procedure and Equipment Drafting Subcommittee to accomplish the following tasks:

* Prepare a test procedure for conducting safe, efficient, and traceable field testing of EVSE electrical energy-measuring devices that clearly addresses the point where the test connection occurs relative to the vehicle connection (for both plug-in and wireless systems).
* Prepare a list describing the fundamental test equipment that must be available to conducting safe, efficient, and traceable field testing of EVSE electrical energy-measuring devices.
* Review and further develop language for the draft HB 44 Tentative Code proposal to address field testing.

The time frame for the EVSE Meter Test Procedure and Equipment Drafting Subcommittee to complete a draft test procedure will parallel the USNWG’s development of the draft HB 44 Tentative Code proposal. The USNWG anticipates completing a final draft of the draft HB 44 Tentative Code proposal by the fall of 2013, which marks the start of the Weights and Measures standards development cycle for 2014.

The USNWG unanimously elected Ted Bohn (ANL) as the Chair and Tim Morgan (Duke Energy) as the Technical Advisor for the EVSE Meter Test Procedure and Equipment Drafting Subcommittee. The following is a list of USNWG members who volunteered to serve on the subcommittee. Some members (as noted below with an asterisk \*) stated that they were volunteering pending the approval of their organizations’ management. These volunteers will notify the Subcommittee Chair when they have approval from their management.

**EVSE Meter Test Procedure and Equipment Drafting Subcommittee**:

* **Chair:** Ted Bohn (ANL)
* **Technical Advisor:** Tim Morgan (Duke Energy)
* Richard Lowenthal (ChargePoint)
* Either Don McComas or Derrik Weeks (Eaton)
* Andrei Moldoveanu (NEMA)
* Jim LeClare (Maxim Integrated)
* Steve Brown (UL)
* Marc Buttler (NIST)
* Steve Cook\* (CA DMS)
* Jeff Mazer\* (NIST)
* Tom Nelson\* (NIST)
* Ambler Thompson\* (NIST)

The Subcommittee Chair also plans to recruit a meter manufacturer to join the Subcommittee.

The HB 130 MOS proposal must be completed prior to the HB 44 Tentative Code proposal. Consequently, further discussion on the draft HB 44 proposal was postponed to a later meeting.

## 6. NIST Handbook 44 Section 1.10. General Code.

**Background:** A copy of NIST Handbook 44 Section 1.10. General Code. was distributed to USNWG members on November 29, 2012. USNWG were asked to submit comments to the Technical Advisor by January 8, 2013.

No comments or proposed changes were received relating to the NIST Handbook 44 Section 1.10. General Code.

**Decision:** The USNWG will not submit a proposal to revise the NIST Handbook 44 Section 1.10. General Code at this time. However, this decision may be revisited as the USNWG continues to develop the draft HB 44 Tentative Code proposal if a need for changes to the General Code becomes apparent.

## 7. Action Items

The USNWG reviewed the progress accomplished and action items from the meeting.

|  |  |  |
| --- | --- | --- |
| Task | Responsible Party | Due Date |
| Review and prepare comments on the draft copies of the USNWG Guidelines (Attachment 8) and Agenda Submission Form (Attachment 9) that were distributed at the January 15-17, 2013 meeting. | All USNWG members | Next USNWG meeting;  March 26, 2013 |
| Assemble the Subcommittee members and develop a plan to complete the goals of the EVSE Meter Test Procedure and Equipment Drafting Subcommittee. | EVSE Meter Test Procedure and Equipment Drafting Subcommittee Chair | Next USNWG meeting;  March 26, 2013 |
| Determine if there is activity elsewhere in the Weights and Measures community on the subject of social media and online advertising requirements that would potentially impact the USNWG HB 130 MOS proposal. | USNWG Chair and Technical Advisor | Next USNWG meeting;  March 26, 2013 |
| Complete the final changes to the USNWG HB 130 MOS proposal that were agreed to in the meeting and forward the finished proposal to the NCWM L&R Committee with a recommendation that the proposal is ready for voting at the 2013 NCWM Annual Meeting. | USNWG Technical Advisor | Prior to the  NCWM Interim Meeting; January 25, 2013 |
| Schedule the next USNWG meeting. | USNWG Technical Advisor | March 4, 2013 |

## 8. Next Meeting

**Discussion:** Multiple members volunteered to host an in-person meeting on the West Coast. Several members expressed a desire to set regular 4-hour online meetings of the USNWG on a weekly basis to speed the work of the USNWG.

**Decision:** The Technical Advisor will investigate NIST budgeting and resource constraints to determine what frequency of meetings NIST can support.

*Technical Advisor’s Note: The next meeting is scheduled as a tele/web-conference that will be hosted by NIST online March 26, 2013 from 1:00 PM to 5:00PM Eastern Time. Details regarding how to connect to the meeting; documents for review; and meeting documents will be sent to all USNWG members in advance of the meeting. At present, NIST resources are not available to support meetings any more frequently than every 6-8 weeks.*

**Contact information:**

|  |  |
| --- | --- |
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