

**National Type Evaluation Technical Committee  
Measuring Sector Annual Meeting  
October 2-3, 2009 Clearwater Beach, FL**

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## **National Type Evaluation Technical Committee Measuring Sector Annual Meeting October 2-3, 2009 Clearwater, FL**

### **Meeting Summary**

Chairman, Mike Keilty (Endress and Hauser) opened the meeting by welcoming participants and asking for round-the-table introductions. Mike also described the purpose of the Measuring Sector (hereafter referred to as the “Sector”) and others contributed insights on how the Sector interacts with other committees in the National Conference on Weights and Measures (NCWM). Mike also described procedures for commenting on issues during the meeting and indicated that, should an item be presented for an official “vote” during the meeting, only those listed on the “voting members” list provided by the NCWM will be recognized.

Accompanying this summary as “Appendix A” is a list of “Action Items” agreed to at the meeting.

### **Carry-over Items:**

#### **1. Table of Key Characteristics of Products in Product Families for Meters Table**

**Source:** Carryover Item – 2007 and 2008 Measuring Sector Agenda

**Purpose:** For the past several years, the Sector has been working to revise the “Product Family” tables in NCWM Publication 14 (Pub 14) with the goal of clarifying the tests to be conducted and products to be referenced on an NTEP Certificate of Conformance based on NTEP testing. This item is included on the agenda to allow for review of a recent revision to the tables and to determine what additional work is needed.

**Background:** At its 2006 annual meeting, the Sector established a small work group tasked with developing proposed changes to the Product Families for Meters table in NCWM Pub 14 to help improve consistent application and ease of use of the table. In 2007, the Sector heard a progress report from the work group and considered a number of proposed revisions (see the 2007 meeting summary for details). The work group also noted additional work was needed to list the various liquids, describing their viscosity, specific gravity, and conductance.

At its 2008 meeting, the Sector was asked to consider another proposal from the work group, consisting of (1) a proposed table listing product families/groups along with typical product names and corresponding viscosities and specific gravities; and (2) a proposed revision to the product families table outlining test requirements for different meter types within each product family. The Sector also discussed the categorization of Liquid CO<sub>2</sub> and the inclusion of milk and dairy products under separate agenda items.

After considerable review and discussion and on-screen editing of proposed variations of the table, the Sector reached a consensus on the format of the table, agreeing to divide the information into three tables: Table C.1. Tests to be Conducted (identifying tests to be conducted); Table C.2. Product Family Table (outlining product families broken down by meter technology and referencing tests from Table C.1.); and Table C.3. Typical Product Family Characteristics (listing typical products in each product family and the viscosity and specific gravity of each). At the end of the meeting, there was general agreement that the proposed revisions represent major improvements, while acknowledging that additional work was needed (see 2008 Sector Summary for additional details.)

At the conclusion of the 2008 meeting, the Sector once again agreed that a consensus had been reached on the general revisions to the format, but that additional content changes are needed. Based on a reluctance to wait an additional year to implement the corrections already agreed upon, Sector members present agreed that additional revisions should be made and the Sector balloted. Following the 2008 meeting, Mike Keilty prepared and distributed a ballot. The results of the vote indicated a lack of consensus for the additional changes proposed.

**Recommendation:** Based upon comments received as a result of the ballot and additional research on product characteristics, Sector Chairman Mike Keilty developed a revised version of Policy C. Product Families for Meters (including revisions to the three “product family” tables) for consideration by the Sector in September 2009. This version was distributed as an attachment to the 2009 Sector Agenda (see Appendix B) and Sector members were asked to review the draft and consider it for inclusion in the 2010 edition of NCWM Pub 14.

**Discussion:** At the 2009 Sector Meeting, Mike Keilty reviewed the history of the item and then described key features of the most recent version Policy C. Product Families for Meters that was included with the 2009 Agenda. Mike noted that:

- (1) Table C.1. (Tests to be Conducted) tests are identical to the current Pub 14;
- (2) Table C.3. (Typical Product Family Characteristics) is an extraction of the products and their characteristics;
- (3) There were some items that need to be addressed. For example, the Sector agreed to add “juices and beverages” to the table last year, but this didn’t show up in Pub 14.
- (4) In Table C.3., there was originally a question about the abbreviations for centipoises and the abbreviation now appears as “cP” with P capitalized because it is an abbreviation of a proper name.
- (5) The breakout of the terms in the remainder of Table C.3. were taken from current version of Pub 14.
- (6) References are closer to branded chemical names.
- (7) Additional data in the agrichemicals area that people provided to Mike are included.
- (8) Additional information is still needed in defining “crop chemicals.”
- (9) Additional items need to be corrected, such as the addition of the “juices and beverages” categories.

Mike suggested that the Sector begin its discussion of this item by first focusing on the format of the proposed table and then discussing its contents. Many positive comments were made regarding the format. Some questioned how to handle products that are not presently referenced in the table. Steve Patoray (Consultants on Certification) questioned the use of the term “normal liquids,” noting its meaning is not clear.

Some questioned why different metering technologies are treated differently. For example, “normal liquids” for mass flow meters encompasses a much wider range of products than do other technologies. Mike Keilty and Will Wothlie (Maryland Weights and Measures) pointed out that for technologies new to the type evaluation program, more testing is required until data and NTEP experience with the technology illustrates expected performance for given product groupings. For example, when NTEP first began testing with turbine meters, the number of tests and flow rates were greater than for other technologies, which were more familiar to the NTEP program. As experience with turbine meters increased, NTEP broadened the coverage that could be obtained with a given test. An additional reason for the variation in how meter technologies are addressed in the table relates to how a given meter technology is affected by product characteristics. For example, changes in viscosity may affect one meter technology more than another meter technology. Others reiterated that the goal in establishing the “product family” table(s) was to minimize the amount of testing required by identifying groups of products which would give similar test results. For example, testing with one or two products from the group would illustrate performance similar to what would be expected for other products in the group.

Rich Miller (FMC Technologies) commented that the basic format and approach used in the table seems to have originated with PD meters; the Sector is trying to fit other meter technologies into the same format without acknowledging that some of the criteria do not make sense for those technologies. He further commented that meter technology should not matter; the criteria should be based on performance and the criteria should be applied equally across all meter technologies. Rich Tucker (RL Tucker Consulting) observed that the “normal liquids” seem to be causing some confusion for people, noting that the term only appears to be significant for mass flow meters and perhaps clarifying that term might eliminate some of the concerns. He also observed that the current criteria have been in Pub 14 for years; the current effort is to attempt to make the table more manageable and, if there are concerns about the criteria, perhaps this needs to be worked on and brought back as a separate proposal. Sector Technical Advisor, Tina Butcher (NIST Weights and Measures Division) noted that, since the format seems acceptable to many, footnotes regarding the application of the term “normal liquids” might be used as an interim measure to allow the current criteria to be more easily applied, and alternative proposals could be developed as a separate effort to address concerns about inconsistencies found in other sections of the current criteria. The Sector discussed the use of the term “normal liquids” at greater length without coming to any resolution on how to address its use.

In the course of discussing the criteria and format of the tables, several people suggested that a better approach might be to separate the tables by technology. Steve Patoray and Henry Oppermann (Weights and Measures Consulting) both offered to develop alternative formats and presented them to the Sector on the second day of the meeting. Mike Keilty and Tina Butcher agreed to make modifications to the three proposed tables in an attempt to clarify the use of current terminology.

On October 3, Steve Patoray and Henry Oppermann each presented alternative versions of the table which they had developed for two different metering technologies. The Sector reviewed the alternative prepared by Steve and the alternative prepared by Henry as well as modifications to the existing proposal prepared by Mike Keilty and Tina Butcher.

Comments indicated that most prefer the approach in which technologies are addressed in separate tables, though Rich Miller expressed disappointment that technologies are broken into separate tables and treated differently. Will Wothlie noted that the version prepared by Henry appears to be the easiest to use, also noting that the ascending order of the product by specific property values is more relevant to the metrologically significant factors. Participants noted that additional work is needed to further develop an alternative table that combines or includes this approach and format, and a small work group was formed for this purpose as described in the "Decision" below.

***Decision: Of three alternative versions of the table presented to the Sector during its 2009 meeting, the approach in which technologies are addressed in separate tables was viewed as a more appropriate approach.***

***[Technical Advisor's Note: An example of this format is illustrated in Appendix C in a draft prepared by Henry Oppermann and further revised and reformatted by Mike Keilty. This work is still in progress and the draft in this appendix is provided only to illustrate the general format agreed upon.]***

***Mike Keilty will continue to shepherd this work, coordinating with those who have expressed interest in this issue and welcoming additional input from other Sector members. Work will be done to integrate the separated technology proposal with that presented at the 2009 Sector meeting. This newly edited version will be circulated among Measuring Sector members and discussed with those members who are able to attend the January 2010 NCWM Interim Meeting. Based on any comments received, additional revisions may be made prior to presenting a revised draft to the Sector at the 2010 Sector meeting. The goal is to develop a version for inclusion in NCWM Pub 14 in which it is easy to understand which tests and procedures must be followed for type evaluation testing.***

## **2. NTEP Checklist for Hydrocarbon Gas Vapor Meters in Sub-metering Applications**

**Source:** NTEP Director

**Purpose:** CA DMS, working with members of industry, has updated a draft checklist for hydrocarbon gas vapor meters in sub-metering applications. This item is included on the Sector agenda to allow for an update on this work and to discuss further action required by the Sector.

**Background:** At its 2006 meeting, the Sector was asked by the NTEP Committee to consider and develop a checklist for residential hydrocarbon gas vapor meters. These devices will most likely be used for sub-metering. At that meeting, the Sector heard that several states had recently contacted NTEP regarding these devices. California already has type evaluation and certification of these devices in their state. The Sector was asked to review the procedures used by California (which were included as Appendix D of the 2006 meeting agenda) and rework them into a format acceptable for NCWM Pub 14. The Sector agreed at that time that the best approach for developing a Pub 14 checklist for LPG vapor meters would be the utilization of a WG made up of technical experts and other interested parties. Dan Reiswig (California Division of Measurement Standards, NTEP Laboratory), was to provide a list of vapor meter manufacturers to be contacted for participation in the WG.

At its 2007 meeting, the Sector reviewed a draft presented by the California NTEP laboratory and agreed that the California NTEP laboratory and the NTEP director would continue to develop this checklist for presentation and discussion at the next Sector meeting.

At its 2008 meeting, the Sector, at the suggestion of the NTEP Measuring Laboratories, raised the question of whether or not there is interest in developing this checklist, particularly given the small number submitted for

evaluation in the past and the availability of California's certificate as an alternative. Since the bulk of work remaining was in the reformatting of the checklist, the Sector agreed that the CA NTEP Laboratory will work to reformat the checklist into a Pub 14 format. Norman Ingram (CA Division of Measurement Standards, NTEP Laboratory) agreed to coordinate with Maurice Van Puten (meter manufacturer) and Jim Truex to work on this issue between now and the next Sector meeting.

A copy of a revised draft checklist was distributed to the Sector prior to its 2009 Meeting; a copy of the draft checklist is included in Appendix D to this summary. At its 2009 meeting, the Sector revisited the need to include a checklist for these devices in Pub 14. Henry Oppermann, who noted he had experience testing these devices prior to his career at NIST, questioned the need for a separate checklist. Others questioned where they would fall in the product family table and what test criteria would apply. Dan Reiswig noted that the meters recently tested are of a different technology than previously encountered. Mike Keilty asked the Sector to consider the general question of whether or not the checklist is complete and ready to move forward and whether or not the checklist references anything that isn't currently referenced in NIST Handbook 44.

***Decision:*** While some Sector members present at the meeting have tested these devices, there were no manufacturers of these devices present at the Sector meeting. The Sector heard no specific comments on the checklist and, hearing no real opposition, decided to forward the checklist to the NTEP Committee for their consideration.

***The Sector agreed that Tina Butcher, NIST Technical Advisor, would forward the HydroCarbon (HC) Vapor Meter Checklist developed by CA to the NTEP Committee by November 1, 2009 for their consideration for inclusion in NCWM Pub 14.***

### **3. Testing Meters Made of Different Materials**

**Source:** California NTEP Laboratory – Carryover from 2007 Measuring Sector Agenda

**Purpose:** For the past several years, the Sector has been discussing the issue of how to assess variations in meter materials in conjunction with type evaluation testing. A key point of contention in these discussions revolves around changes to meter materials from that used in the meter evaluated during type evaluation. The NTEP laboratories would like more definitive criteria to help them assess when changes to meter materials are metrologically significant to the extent that additional testing should be required in order for the new material to be covered on the NTEP CC. Meter manufacturers generally believe that changes in materials should be left to the judgment of the manufacturer since they must ensure continued meter performance for their customers and, as the designers of the meter, they well understand and take into consideration product and environmental applications and adjust materials accordingly to meet the needs of the end application. The issue is further complicated by the lack of definitive criteria that would guide the NTEP laboratories in making a decision about which meter materials should be selected for testing to be representative of a range of materials. This item is a continuation of past discussions by the Sector on this issue.

**Background:** The Sector reviewed this issue at its 2007 and 2008 meetings, but was unable to reach a consensus on the item. The Meter Manufacturers Association had also prepared a white paper in which they noted that it is the manufacturer's responsibility to ensure that a meter meets type, noting the long history of meter compliance and also that NIST Handbook 44 is not intended to differentiate between measurement technologies, only the intended application. They also pointed out questions to be answered in order to make an informed decision on this issue include: (1) Is there a real world problem that requires a solution by inclusion of a new section in NCWM Pub 14 specifically aimed at materials?; and (2) Is there an inequity in the market or facilitation of fraud?

At its 2008 meeting, the Sector had extensive discussion over specific examples of meter sizes, product applications, and component materials. There were clearly divided opinions regarding how these combinations should be addressed. Manufacturers generally seemed to feel that component materials relative to the intended meter application are a design issue and should be left to the manufacturer to address, particularly since they will ultimately be responsible for ensuring that the meters work accurately and their customers are satisfied. Some NTEP laboratory representatives were comfortable with the idea of allowing the marketplace to take care of this issue, whereas others were not, particularly citing their feeling of responsibility in attesting to the accuracy of what is listed on a CC. However, it was clear that all laboratories felt the need for additional guidance in how to handle

variations with regard to the amount of testing required and on how to handle listing materials information on the CC to ensure consistency among all of the laboratories.

The Sector was unable to reach any consensus on this issue; however, the Sector acknowledged that the issue is not going to be eliminated from the Sector's agenda. Criteria (whatever that may be) regarding how to address materials must be included in Pub 14, and guidance needs to be given to the NTEP Laboratories to ensure this issue is consistently addressed for all evaluations.

**Recommendation:** The Sector was asked to reconsider this issue and attempt to reach a resolution. The original proposal first considered at the Sector's 2006 meeting is included for reference along with an excerpt of the discussion from the Sector's 2008 discussion of this item.

**Original Proposal from 2006 Sector Meeting:**

The following proposal was offered as a possible solution. The Sector reviewed the proposal for possible forwarding to the NTEP Committee for inclusion in Publication 14.

**Proposal:** Add a new Section F. to the Publication 14 Technical Policy as follows and renumber subsequent sections:

**U. Meters Made of Different Materials within the Same Family**

**When multiple meters made of different materials within a meter family are submitted for evaluation all meters will be tested with at least one product from each product family to be included on the CC and at least one meter will be tested with the range of products required in the Product Family Table for the meter type (e.g., positive displacement, turbine, mass meter, etc.) submitted for evaluation.**

**Excerpt from Item 3 of the 2008 Measuring Sector Final Meeting Summary:**

**Discussion:** Steve Patoray described (from his perspective as past NTEP Director) the scenario discussed at the 2006 and 2007 Sector meetings. He noted that materials used in devices are considered metrologically significant for weighing applications and questions were raised about whether or not materials are metrologically significant for metering applications. Some had suggested that using criteria similar to that used by Underwriters Laboratories might be considered. He indicated that many were uncomfortable with the concept of defining a "worst case" scenario for particular materials. He further noted that the question was raised of where to stop in the examination of device components: the body of the meter, or the seals, or other location? Manufacturers indicate that these questions are all part of the design process and inherent with assembling a device intended for a given application. Steve concluded his overview by noting that a key question is whether or not additional testing is needed based on variations in the materials used in the metering system and further commented that it is not likely that a field official will be able to determine these differences by visual examination. The inspector just needs to have confidence that the meter they are examining is covered by the CC. An overriding concern of NTEP is to ensure that the evaluation is fair and that the requirements are being applied consistently to all manufacturers. At present, NTEP has no guidance on how to handle these different scenarios.

Allen Katalinic (NC) commented that while changes to significant components of a meter will make a difference, there are many parts in a meter where changes will not have any metrological impact. Mike Frailer (MD) noted that a key difficulty on the part of the evaluator is in assessing how to consistently assess whether a given change is metrologically significant, and Jim Truex (NCWM NTEP Director) noted that this depends on how one defines "metrologically significant." Paul Glowacki (Murray Equipment) commented that Jim's point touches on the basic issue, which is how to define what changes can be made without reevaluation. A manufacturer may be confident that a change in material will not affect a meter's performance; however, an evaluator may not agree and may require re-evaluation. There have to be some guidelines because, at present, Paul feels as if every CC is a negotiation and what is applied to one company may be different than what is applied to another company. Tina Butcher (NIST WMD) commented that the technical policies in Publication 14 strive to minimize the amount of testing required for a manufacturer to list the maximum number of devices on a CC. She stated that, for the NTEP laboratories, key questions are: (1) whether the laboratories and NTEP management have adequate information to enable them to assess when additional testing is needed in order to list particular variations on the CC, and (2) how

they can make that assessment consistently from manufacturer to manufacturer and from laboratory to laboratory. NTEP has developed experience with some basic types of changes to devices through trial and error and in consulting with manufacturers; the laboratories are asking for specific guidelines with regard to materials variation. Mike Keilty noted that manufacturers submit a sample(s) of a device in good faith and expect a rigorous evaluation; however, manufacturers are concerned that the amount of testing not be expanded beyond what is economically feasible.

Relaying discussions from the NTEP laboratory meeting prior to the Sector meeting, Jim Truex commented that the laboratories also have a dilemma in assessing how to avoid “horror stories” such as experiences with E85 while establishing reasonable guidelines. Jerry Butler (NC) also noted that, while many manufacturers such as those who have long participated in NTEP Sector meetings and evaluations are conscientious and laboratories may trust their judgment, laboratories are seeing an influx of equipment from sources (sometimes off shore) with which they have had little experience and whose manufacturers sometimes have little if any experience with legal metrology requirements, let alone U.S. requirements. This concern was echoed by other laboratories who also noted confidence in manufacturers participating in this discussion, but recognized that policies must be in place to ensure fair treatment. Several manufacturers commented that the industry will take care of substandard products produced by competitors by bringing such instances to NTEP’s attention; reputable manufacturers cannot afford to allow substandard products to undercut the market when they themselves are expending the resources needed to comply.

The Sector also had some discussions about replacement parts and how these affect metrological integrity, with some members noting that field officials are unable to determine when non-metrologically equivalent or inferior components are used by visual examination. Several members commented that this is not something that can be prevented by increased evaluation at the type evaluation level, but is rather addressed by performance testing in initial and subsequent verification. In addition, the manufacturer is equally concerned about unauthorized substitutions since this can affect the reputation of their product. In that same vein, a manufacturer would not make a change in materials unless he is confident that the change would not affect the performance of the device in his customer’s application. Rodney Cooper (Actaris) pointed out that reputable manufacturers police themselves to ensure their customer’s continued confidence. Norm Ingram (CA) pointed out that manufacturers have designed these products and know from experience what will work, so perhaps the best approach is to allow them to make these changes and allow the marketplace to take care of itself. Norm did note, however, as did Dan Reiswig (CA), that even if the issue is tabled, the laboratories still need guidance on how to consistently approach proposed changes with regard to issuing CCs.

Dmitri Karimov (Liquid Controls) and others pointed out that NTEP has largely relied on the integrity of the manufacturer in reporting changes to devices and that, in many cases, NTEP or a field official would never be able to tell the difference. For example, if a rotor is changed, there is no reasonable way that weights and measures officials can determine that the clearances are different. In addition, NTEP has also relied primarily on the manufacturer to provide guidance on when a particular change is metrologically significant. With regard to material, the manufacturer’s concern is in making sure that the materials are compatible with the product being measured in the application. Sector Chairman Mike Keilty (Endress and Hauser) questioned how conformity assessment might factor into this issue and contribute to resolving some of these questions.

Rich Tucker (RL Tucker Consulting) echoed an earlier comment by Norm Ingram, noting that most manufacturers change materials because of the products with which the meter will be used. When a manufacturer finds through experience that a particular change creates problems, manufacturers make adjustments accordingly to ensure continued performance. Rich even noted there were instances when NTEP passed a material in an evaluation and that material later proved to be problematic. The majority of the time materials issues will resolve themselves and most of the testing requirements imposed by the product families table are going to address any question about materials.

The Sector also discussed numerous examples of specific materials and their effect on metering of different product types; however, these discussions provided no insight on how to best address the materials issue. Steve Patoray reminded the Sector that its purpose is to advise the NTEP administrator, and Publication 14 will only be changed if the NTEP Committee agrees with the Sector’s recommendations.

Will Wotthlie (MD) commented that the laboratories are putting their reputation on the line by issuing a CC and saying that it covers everything listed on the CC; the laboratories want to have confidence that the devices will

work and field officials are, in turn, relying on that assurance. Will also questioned why NTEP is needed if the feeling is that everything in the field will take care of itself. Mike Keilty noted that a balance needs to be achieved between a system that can be practically executed and one that will still provide confidence; manufacturers are concerned about expanding testing beyond what is economically feasible.

Will Wotthlie suggested that an alternative is for the labs to simply list what is tested on the CC under the testing conditions section; however, some manufacturers indicated they want to continue to list materials of construction on the CC under the “Standard Features and Options” section. Jim Truex noted that a CC is not meant to be a marketing tool. Tina Butcher commented that, in its early days, NTEP decided that only metrologically significant things should be listed on the CC. If this position is to be maintained, then the Sector needs to decide whether or not to include the metals on the CC if all options are covered. If the Sector concludes that the material is not significant, then perhaps a statement needs to be included in Publication 14 to that effect. She also reminded the Sector that the laboratories are not only trying to assess whether or not a new variation in material can be covered on the CC, but also how to determine which of two meters to select for testing when they are made of different materials.

Some members, including NTEP laboratory representatives as well as manufacturers, stated that if the materials feature or attribute is not metrologically significant, it doesn’t belong on the CC; the information can be listed in the test conditions, but not on the front of the CC under the “Standard Features and Options.” Dmitri Karimov questioned why the information would be listed in the test conditions if it isn’t metrologically significant. Others noted that this record of the test conditions may eliminate the need for additional testing should policies change at a later date. Jim Truex also pointed out that if the information is to be listed on the front of the CC, it will be necessary for the laboratory to determine the “worst case” scenario with regard to materials.

At present there is a great variation among existing CCs with regard to how materials are referenced. Steve Patoray noted that there are differences in how manufacturers request this information be reflected on their CCs; some want various model numbers listed, including different materials. Some believe that the only thing that should be listed on the CC is the product application for which the meter is approved, not the materials. Jerry Butler (NC) questioned why the manufacturers want to list all of these different products on the CC, commenting that it is up to the manufacturer and the customer to make sure the meter is right for the application. He further noted it would be helpful to have materials construction identified through the model designation.

Questions were raised by the manufacturers and laboratories about how CCs will be handled until the Sector can reach an agreement with regard to testing requirements for materials variations. Jim Truex reiterated that the purpose of a CC is not a marketing tool. Jim indicated that, as NTEP Director, he is not comfortable with listing all these different features unless the laboratory has tested them. Without taking a position on whether or not “materials” are considered a metrologically significant feature, Jim indicated that, for consistency purposes, NTEP will not list materials in the standard features and options; however, the information will be listed in the test conditions for the meter(s) tested during the NTEP evaluation(s). He noted this will be an administrative decision to ensure consistency. In response to a question about whether eliminating the reference to materials of construction in the “standard features and options” section would affect existing CCs that presently list this information, Jim stated that no changes would be made until the CC is being revised for other reasons.

After extensive debate on the first day of the meeting without resolution, the Sector returned to the discussion the following day with little additional progress. At that point, Mike Keilty noted that there are manufacturers who have product materials listed on their CCs and those who do not have the materials listed. He commented that, in establishing guidelines, the Sector has tended to draw a broad brush across metering technologies and, in many instances, treated them as the same even though people know they are not made the same way. Manufacturers generally make the materials of the meter to be compatible with the product to be measured and manufacturers may take different approaches in ensuring this compatibility. Andre Noel (Neptune) pointed out that some meters are made of different materials for different product applications, and the change in product necessitates an additional evaluation. Andre noted that a manufacturer can’t make a meter out of bronze, for example, and use it to meter a caustic material because it will fail. Manufacturers take the product application and other application details into account when designing and choosing a meter for a given application and will relay this information to the customer with regard to where the meter can be used. Andre further noted that this becomes a question of liability for the manufacturer since the customer will hold the manufacturer accountable. Some members also made note that the materials may be more significant for some meter technologies than for others.

The NTEP laboratories are asking for guidance to ensure consistency, but the Sector seems to be at an impasse with regard to how to provide that guidance. The Sector was not able to agree upon and general guidance that would assist the laboratories in understanding material construction and its impact on device performance. The laboratories need to be comfortable that the testing they have conducted supports the variations listed on the CC. Dennis Beattie (Measurement Canada) observed that the issue seems to focus on the question of how the materials affect the definition of what constitutes a “family” of devices. He also pointed out in response to an example of a manufacturer choosing a lighter material for a vehicle-mounted than a stationary application that some materials such as aluminum respond differently to changes in temperature.

**Discussion:** At its 2009 Meeting, the Sector once again spent considerable time discussing this issue.

Dmitri Karimov (Liquid Controls) advised that a number of manufacturers present, met separately just prior to the second day of the Sector meeting to discuss this issue. He reported that most manufacturers felt that the issue should be dropped from the Sector’s agenda.

Dan Reiswig (CA) and Will Wotthlie (MD) commented that, if the item is dropped, then this would mean that the NTEP laboratories would test what is submitted and list the material on the NTEP Certificate under the test conditions. Rich Miller (FMC) clarified that listing the material on the NTEP CC was not the intent of the manufacturers’ position. He stated that materials of construction should not be considered a metrological issue. He noted that the premise of the manufacturers’ arguments in past discussions of this issue is that, if the meter is misapplied in the application, then the customer is going to come back to the manufacturer to resolve the problem. The manufacturers should be looked to as the experts since they are the designers of the meters and understand what must be done to ensure continued compliance in different applications. He also questioned whether the meter would pass the NTEP test to begin with if the materials weren’t suitable for the application.

Jerry Butler (NC), pointed out that failures from improper material selection do not always arise in the limited space of time involved in an NTEP test. As stated by NTEP laboratories and others in previous discussions of this issue, Jerry reminded the audience that NTEP evaluations include meters manufactured by companies who are not as conscientious as the manufacturers present at this meeting and who are not familiar with the process and requirements for legal-for-trade applications. It is largely with these manufacturers that the concerns lie and weights and measures officials rely on the NTEP laboratories for the credibility of the NTEP CCs. Rodney Cooper (Actaris) stated that the manufacturers believe that this should be up to the manufacturers to control. The Sector had similar discussions about companies that “clone” meters covered by existing NTEP CCs, but that don’t use the same (appropriate) materials. Gordon Johnson (Gilbarco) noted that if manufacturers are competing with clones, they will go out of business.

Rich Miller reiterated that a key point with this issue is that this is really a question of a misapplication of the meter. If the meter with the right materials is not selected for the application, then problems can arise. For example, if a meter with carbon steel bearings is selected to measure water and the meter eventually failed, it was a misapplication of the meter. It is not the meter design itself that is a problem, but rather the selection of the meter materials for that product application.

Steve Patoray (Consultants on Certification) pointed out that meter failure can also arise from other factors such as other influences or components in the system. Manufacturers will work to resolve the problem, but the problem is not always the meter or its materials. He reminded the Sector that this entire issue was raised because some manufacturers were advising NTEP of materials changes and were subjected to additional NTEP testing. Others made materials changes, but did not notify NTEP of the changes and were not subjected to additional NTEP testing. This inconsistency led to the inclusion of this issue on the agenda. He also noted that the CCs should reflect a clear definition of type and that differences should be noted in some manner on the CC such as in the model designation.

Mike Frailer (MD) reiterated that the NTEP laboratories are looking for additional guidance to assist them in determining when a change is metrologically significant and would, therefore, require additional testing. Will Wotthlie (MD) pointed out that, if this item is dropped from the agenda entirely, the labs will revert to their previous approach of conducting additional testing when a materials change is made; this is not something that is desirable for the manufacturers.

Tina Butcher (NIST) questioned whether, if the materials are changed based on the product application, wouldn't the NTEP laboratories have done testing with different materials when the tests were done for the different product applications. Couldn't this tie to the product family table? The manufacturers present indicated that testing of different materials by virtue of testing different product applications would generally be the case. Steve Patoray noted that this is also a reason that there is concern about the product family table; that the current table was developed for a specific technology, positive displacement meters. Dan Reiswig (CA) observed that he doesn't oppose changes to the product family table, particularly if it would help provide uniform information about the effect of material changes.

Will Wotthlie (MD) pointed out that the product family tables were actually further broken down several years ago based on an effort led by Charlene Numrych (LC) and involving other manufacturers. With regard to the materials issue, we can't seem to get all manufacturers to agree that materials are metrologically significant. Paul Glowacki (Murray Equipment) noted that the manufacturers were asked to identify what guidelines and criteria they could accept; however, the manufacturers may be going too far in one direction for the regulators' comfort. He noted that the manufacturers want clarity and also discussion about what defines "metrologically significant" rather than focusing only what is metrologically significant with regard to product families and materials.

Sector Chairman, Mike Keilty (Endress and Hauser), questioned whether this issue should be dropped since it has been on the agenda for an extended period of time without resolution and no data has been provided to move the issue in any direction. Rich Miller (FMC) indicated that they are willing to provide data, but noted that eliminating product subcategories in the product family tables might eliminate some of the issues related to materials.

After discussing this issue at great length and examining various aspects of the points raised earlier in this discussion, the Sector concluded that this issue will not reach resolution by continuing to discuss it at the Sector meetings alone. They agreed that it would be better to form a small work group of interested parties who can focus their attention on trying to come up with a solution to this issue using the expertise available within the various metering technologies. Henry Oppermann (Weights and Measures Consulting) pointed out that this topic is related to the product family topic in Agenda Item 1. The two topics should be discussed together since both are focused on trying to identify and define what constitutes metrologically significant factors.

***Decision: The Sector agreed to form a work group, the "Metrologically Significant Characteristics of Technologies Work Group," to arrive at a uniform, appropriate, and clear approach for initial, subsequent, and additional tests for the performance of a device technology. The following people agreed to serve on the work group:***

<b><i>Chair:</i></b>	<b><i>Rodney Cooper</i></b>
<b><i>Co-Chair:</i></b>	<b><i>Rich Miller</i></b>
<b><i>Work Group Members:</i></b>	<b><i>Marc Buttler</i></b>
	<b><i>Paul Glowacki</i></b>
	<b><i>Mike Guidry</i></b>
	<b><i>Gordon Johnson</i></b>
	<b><i>Dmitri Karimov</i></b>
	<b><i>Henry Oppermann</i></b>
	<b><i>Steve Patoray</i></b>
	<b><i>Dan Reiswig</i></b>

***The work group was tasked to:***

- (1) Create a short list of features/options affecting the metrological characteristics of each device technology by December 15, 2009;***
- (2) Prepare a 1-page analysis that briefly documents and provides the rationale for including each metrological characteristic in the list (referenced in task 1) by December 15, 2009;***
- (3) Review the first draft list of significant constituents and condense that list to only relevant characteristics;***
- (4) Prepare a final list for a work group meeting during the NCWM Interim Meeting by January 15, 2010***

*Should revisions be needed prior to presenting an updated draft of Policy C. to the general Sector membership, the work group could potentially meet again at the July 2010 NCWM Annual Meeting in addition to completing additional work through electronic communication in the interim period.*

#### **4. Add Testing Criteria to NTEP Policy U “Evaluating electronic indicators submitted separate from a measuring element”**

**Source:** California NTEP Lab

**Purpose:** Since 2007, work has been underway to develop a checklist to evaluate electronic indicators submitted separate from a measuring element. This item is included on the Sector agenda to allow for an update on this work and to discuss further action required by the Sector.

**Background:** At its 2007 meeting, the Sector heard that Section U. of the NTEP Policy in NCWM Pub 14 allows for testing an indicator separate from a measuring element. However, specific test criteria had not been developed for this section. The Sector heard a recommendation to develop and add specific criteria for testing an indicator separate from a measuring element to this section. The California NTEP Laboratory recommended using Canada's test criteria as a guideline for developing the tests outlined in 2007 Sector Agenda Appendices A, B, and C.

The Sector agreed the California NTEP laboratory should lead a WG to develop a specific test procedure and ready the document for review at the 2008 Sector meeting. Members of the WG selected at the 2007 meeting were Dave Rajala (Veeder-Root Company), Rich Miller (FMC Technologies), Maurice Forkert (Tuthill Transfer Systems), Dmitri Karimov (Liquid Controls), Rodney Cooper (Actaris Neptune), and Ralph Richter (NIST WMD).

At the 2008 Sector meeting, Dan Reiswig (CA DMS) reported that he had developed and circulated an initial draft of criteria for separate indicators and a lot of additional input was provided by manufacturers and Measurement Canada were significant contributors to the development of the draft (See the 2008 Sector Meeting Summary for details). Sector Chairman Mike Keilty asked for a renewed commitment from the WG volunteers and asked if others were interested in participating. The WG made plans for additional meetings to further develop the draft.

A copy of the draft criteria to date was included as an attachment to the Sector's 2009 meeting agenda and appears as Appendix E to this summary.

**Discussion:** At the 2009 Sector meeting, Dan Reiswig provided an update to the Sector on progress to develop criteria for separate electronic indicators. He reported that the draft checklist provided to the Sector follows the general format of Pub 14 and the main test procedures are at the end of the document. The procedure specifies tests for applying specific pulses over a range of temperatures and the procedure allows the laboratories to simulate the effects of changes in temperature. Dan noted that he has worked with Measurement Canada's type evaluation laboratory and has completely revised the document from the previous versions based on the collaborations with Canada. The current draft should be viewed as a starting point for the NTEP procedure.

Since the Canadian procedure and test criteria are well developed for testing indicators separately, some questioned the needed to undertake a major project to develop criteria for NTEP testing, suggesting that an agreement to accept Canadian test data be pursued instead. Others noted that the turnaround time for Canadian tests are about 6-7 months and the NTEP process is much faster, so pursuing NTEP testing would be beneficial. The Sector discussed how arrangements between NTEP and Measurement Canada for accepting test data are designed to work. Steve Patoray (Consultants on Certification and former NTEP Director) provided information and an explanation on how such arrangements generally work. In the case of a “one-way” agreement, where the Canadian test criteria are more stringent, testing is performed to the more stringent requirements and then the test data is forwarded to NTEP.

Questions were raised about the readiness of the checklist for inclusion in NCWM Pub 14. The Sector agreed that some additional work is needed and suggested that a small work group be formed to further develop the checklist. One additional question to consider is whether or not the checklist would apply to indicators across all technologies and applications.

**Decision:** *The Sector agreed to the following.*

- *A small work group comprised of the following individuals is to further review and discuss the checklist.*

**Work Group Members:** Rodney Cooper (Actaris)  
Maurice Forkert (Tuthill Transfer Systems)  
Dmitri Karimov (Liquid Controls)  
Rich Miller (FMC Technologies)  
Dave Rajala (Veeder-Root)  
Ralph Richter (NIST WMD)

**Checklist Developer:** Dan Reiswig (CA)

- *The work group will provide input to Dan Reiswig (CA) at least one month prior to the March 2010 NTEP Laboratory Meeting. Dan will provide this input to the Measuring Laboratories. One additional question to consider is whether or not the checklist would apply to indicators across all technologies and in all applications.*
- *Following the March 2010 NTEP Laboratory meeting, Dan will modify the draft checklist based on feedback from the NTEP Measuring Labs.*
- *Dan will provide a copy of the draft checklist to the NIST Technical Advisor by the end of August 2010 to allow for distribution to the Sector one month prior to the Fall 2010 Sector Meeting.*
- *Following the fall 2010 Sector meeting, Dan will work with Sector Technical Advisor Tina Butcher (NIST) to update the draft checklist to reflect the comments from the Sector.*
- *Assuming the checklist requires no further modification or review by the Sector, Tina will submit the checklist to the NTEP Committee to consider for inclusion in the 2011 version of NCWM Pub 14.*

## **New Items:**

### **5. Policy C - Product Family Table – Change in Upper Limit for Oxygenated Blends – Note 4**

**Source:** Gordon Johnson, Gilbarco, Inc.

**Purpose:** Underwriters Laboratories (UL) has modified the upper limit for oxygenates in oxygenated fuel blends specified in its standard UL87A Edition 5. A proposal has been submitted by the Sector to change a reference in the “Product Family” tables to correspond with the revised UL upper limit. This item is included on the Sector agenda to allow input and discussion by the Sector on the proposed change.

**Background:** Gordon Johnson (Gilbarco, Inc.) submitted information to the Sector regarding changes to the upper limit specified by UL on oxygenates in oxygenated fuel blends and proposed changes to NCWM Pub 14 to reflect those changes. Gordon noted that UL recently issued UL87A Edition 5. This standard details the tests and specifications needed to list dispensers for Ethanol and Ethanol blends. The 5th edition specifies 3 major gasoline fuel categories:

- a) Gasoline for Use as Automotive Spark-Ignition Engine Fuel, ANSI/ASTM D4806 (Up to E10)- (Current)
- b) Gasoline/ethanol blends with nominal ethanol concentrations up to 25 percent ethanol (E25) (NEW)
- c) Gasoline/ethanol blends with nominal ethanol concentrations above 25 percent (E85) (Current)

When the EPA set the new ethanol limits, "standard gasoline" will include more ethanol. This affects all gasoline motor fuel dispensers currently in use. Typically we see the need to re-calibrate a dispenser's meter when adding ethanol to the motor fuel. The ethanol acts as a solvent washing away gasoline varnish and the meter may shift its calibration point.

The following additional information regarding the fifth issue of UL's Outline Subject 87A is provided for the Sector's reference:

UL SUBJECT 87A  
OUTLINE OF INVESTIGATION FOR POWER-OPERATED DISPENSING DEVICES FOR GASOLINE AND  
GASOLINE/ETHANOL BLENDS WITH NOMINAL ETHANOL CONCENTRATIONS UP TO 85 PERCENT  
(E0 – E85)

Issue Number: 5 AUGUST 10, 2009

Summary of Topics

This Fifth issue of Outline Subject 87A contains requirements pertaining to a new rating option. This new option will include an E25 rating along with the original E85 rating. This addition will allow for products to carry the lower rating when they are not intended for use with higher blends of gasoline/ethanol. New requirements have been added for blending options in dispensers. This required a new test, the Blending Cycling Test, which addresses the cycling of ethanol blends inherent in this type of use. Various editorial changes have also been included to address testing with one sample rather than two when evaluating for the E25 rating and other editorial changes have been made for clarification.

The Sector was asked to review NCWM Pub 14, Technical Policy C. Product Families for Meters, Note 4 in the product families table, which currently states:

**"Gasoline includes oxygenated fuel blends with up to 15% oxygenate"**

(Note: This footnote appears in Table C.2. Product Family Test Table in the revised version of the Tables currently under consideration by the Sector in Agenda Item 1.)

The Sector was asked to consider changing the oxygenated fuel blends from 15% to 25%. The new note 4 would read:

**"Gasoline includes oxygenated fuel blends with up to 25% oxygenate"**

**Discussion:** At the 2009 Sector meeting, Gordon Johnson (Gilbarco) outlined the history of this issue, noting that UL has made several significant changes to UL 87 (to include an alternative fuel standard) as a result of a push by EPA to coincide with a federal mandate to increase the levels of ethanol in vehicle fuel. The old standard for gasoline (15 % oxygenate) was revised this year to specify a 10 % limit. Gordon noted that the old standard of 15% was not selected based on any equipment data. UL also revised the standard to create a third category which allows up to a 25% blend. Gordon stated that his company is currently is recertifying its dispensers up to E85, 10%, and 15% and will mark the dispensers as such. He expressed concern regarding what will happen to existing dispensers when used for deliveries of 25%. Previously, UL put out a statement that it was up to the local fire marshal accept the electrical system for use with 15%. There is a program to buy back some 30 year old equipment. Some dispensers that are currently in use (standard pumps) were never UL rated or weights and measures approved for E85. Gordon stated that ethanol tends to wash out the sediment resulting in the dispenser giving away some product. He proposed changing the current reference in Pub 14 from 15 % standard to 25 %, noting that he has no data to illustrate the impact of the change. He indicated that both Gilbarco and Wayne are completing tests for E85, but no tests have been conducted for 25%. There is not enough ethanol in production at the moment and he foresees a gradual increase in the amount of 25% fuels. He is concerned that the limits will go above 15% and if weights and measures apply the 15% limit currently referenced in NTEP CCs, then all dispensers will be tagged and place out of service.

In its discussion of this issue prior to the 2009 Sector meeting, the NTEP Measuring Laboratories took the position that it is acceptable for a device to be used with product up to 15 % oxygenate with testing of only gasoline; however, for blends above this percent, the device must be retested with the higher percentage blends. Will Wothlie (MD) noted concerns on the part of the labs that there is no data available to illustrate the impact on the dispenser's performance of the higher blends. Jerry Butler (NC) also commented that some in the room believe that higher blends should be considered an alcohol and that alcohol and gasoline are treated differently in the current product tables. Several lab representatives also commented that, if a supporting statement can be obtained from UL, EPA, and other relevant bodies to say there will not be a problem with the existing dispensers, they might be able to accept the 25% limit.

*Decision: After discussing this issue, the Sector was unable to reach agreement on the propose change. The Sector expressed its appreciation to Gordon Johnson for information regarding recent changes to the upper limit that Underwriters Laboratories (UL) has specified for levels of oxygenates in oxygenated fuel blends. The Sector agreed that this should remain an information item on the Sector's agenda.*

## 6. Electronic Linearization for Positive Displacement Meters

**Source:** Maurice Forkert, Tuthill Transfer Systems

**Purpose:** The Sector received a proposal to establish more definitive criteria for electronic linearization internal to positive displacement meters. This item is included on the Sector's agenda to allow for review and discussion of proposed criteria.

**Background/Recommendation:** Maurice Forkert (Tuthill Transfer Systems) submitted a request for the Sector to consider adding criteria to NCWM Pub 14 for electronic linearization internal to positive displacement meters, noting that there is apparently no regulation for this feature. Maurice Forkert suggested considering Measurement Canada's "Approval Procedure for Linearization Functions Incorporated in Measuring Systems" (Document Number VO-AP-037) as the basis for the criteria, provided there is no objection by Measurement Canada or copyright violation by doing so.

A copy of Maurice's letter proposing this addition along with the Measurement Canada document was included as an attachment to the Sector's 2009 Agenda and is included in Appendix F to this Summary.

Maurice suggested the following revisions to the Measurement Canada document:

- **Section 1.2. Scope**

Add paragraph to the "Scope" of the document as shown below. This paragraph would bring electronic output PD meters, turbine meters, etc. that do not have a shaft output on equal requirements as other meters that currently incorporate electronics in the measuring device.

### 1.2 Scope

This procedure applies to pulse processing electronic devices incorporating the linearization of the pulse per unit volume versus pulse frequency. This includes all flow computers, electronic registers, correction devices and supporting software external to the measuring device. The tests verify the proper functioning and accuracy of the linearization schemes.

For processing electronic devices incorporating the linearization of the pulse per unit that is within the measuring device, the results of the device accuracy and endurance tests will verify the complete measuring device capabilities. The linearization electronics of the measuring device must be protected from tampering and fraud utilizing a physical seal. No separate tests on parts of the measuring device are required.

- **2.1. Equipment Requirements.**

This section needs to be reviewed by the work group developing criteria for electronics. When Tuthill tested their linearization board in Canada, they had problems because their Dual Channel Pulser "off" position of the pulse did not go close enough to zero volts. Tuthill furnished a dual channel pulser that goes down to within 0.2 volts in the "off" part of the pulse and then the Measurement Canada counters worked fine.

- **Section 2.5.1. and 2.5.3.**

The word "devices" should be "EUT."

- **Section 2.6.2.1. and 2.6.2.3.**

Do not limit “meter Factors” to 4 or 5 points. See proposed revisions to 2.6.2.5. below as a method to test all points for which the device is capable.

- **Section 2.6.2.5.**

Delete runs number 2 through number 5 and replace with:

2. Select frequencies that result in flow rates that lie between each pair of points programmed in Section 2.6.2.3. Test at each frequency.

Change Run number 6 to number 3.

- **Factor Limit**

The limit of 3 to 5 factors should be changed to cover any number of factors.

**Discussion:** Maurice explained that his company had introduced a meter into the market with a linearization board and was advised by the weights and measures authority that there were no regulations to address that component. He recommended including the feature as allowable in the register and to not require a separate evaluation of this component. He explained that the part could not be removed or modified without breaking a seal. He also requested that the e-linearization feature be considered as part of the meter just as the pulse output component is looked at as part of the meter.

Henry Oppermann (Weights and Measures Consulting) commented that industry wants to be able to use e-linearization as a means to improve the performance of a meter and noted that this has been done for years with scales and load cells. Provided the performance is within acceptable levels, it should not matter how this is accomplished.

In discussing this issue, reference was made to NCWM Pub 14 Policy G. Range of Data Points, which addresses the use of “multi-point calibration.” This policy specifies that “multi-point calibration” must be “blind and integral” which, according to the policy, is intended to mean it is programmed during the manufacture of the device and is not accessible in the field. The policy also prohibits multi-point calibration from being used as a means to establish the minimum turn down ratios of 5:1 or 10:1; however, it does allow the feature to be used to extend the measuring range beyond the minimum ratios. In discussing how this policy is to be applied in conjunction with Maurice’s example, there were questions regarding the use of the term “blind and integral.” Several members noted that a better definition of the term is needed in order to ensure consistent understanding of the term and its use in the application of requirements.

Maurice noted a distinction in his scenario is that they want the e-linearization feature to be considered a part of the meter, much as one would consider other components of the device. Understanding that the e-linearization feature is used to individually program each meter at the factory, some NTEP laboratory representatives expressed concerns about the possibility of interchanging parts in the field and the impact on meter performance and questioned what means would be provided to deter field replacements. Some manufacturers noted that this should be viewed no differently than replacing other metrologically significant parts in the field; for example, meters are not shipped back to the factory for replacement of a rotor and replacement of the e-linearization board should be viewed in the same light. It is up to the user/installer to ensure continued compliance with accuracy and other requirements.

There were also questions during the discussion regarding whether or not the e-linearization feature should be listed as a feature on the CC. Some pointed out that other device types use metrologically significant components that can be replaced in the field when problems are encountered. Repairs, adjustments, or changes to these features are generally obvious or detectable. Steve Patoray (Consultants on Certification) gave several examples of weighing device applications such as load cells (which are not repairable in the field), junction boxes (which can be protected by a security seal), and electronic boards (which are completely replaced when they fail).

The Sector discussed developing language to clarify the application of Policy G., but was unable to reach a conclusion at the meeting. While they did not identify a specific alternative, there was general agreement that the electronic linearization that is programmed during the manufacture of a device should not be readily accessible in the field without breaking an approved seal. The NTEP Labs expressed concern regarding the unique nature of the

programming and how interchange of the e-linearization board would be controlled in the field. The Sector agreed that this issue requires additional work that would best be accomplished by a small work group.

**Decision:** *The Sector agreed that a small work group comprised of the following individuals be established to further develop this issue for the Sector's review.*

**Chairman:** Steve Patoray  
**Work Group Members:** Maurice Forkert  
Mike Frailer  
Mike Guidry  
Dmitri Karimov  
Rich Miller  
Ken Smith

*The work group was tasked with the following:*

- 1) *Clarify Policy G. Range of Data Points by bouncing ideas off of Mike Frailer for:*
  - a. *Defining what is meant by multi-point calibration shall be "blind and integral" to the measuring element.*
  - b. *Clarifying what is meant by multi-point calibration shall be not "accessible" in the field.*
- 2) *Develop Language in Policy G. Range of Data Points to Allow for Uniform Interpretation and Application of the Criteria by the U.S. and Canadian Stakeholders by February 2010, including*
  - a. *Where necessary to clarify the intent of the criteria:*
    - i. *Modify Language*
    - ii. *Define Terminology*
- 3) *Review and Discuss Modifications to Policy G. at the March 2010 NTEP Measuring Lab Meeting*

## 7. Next Meeting

**Source:** NTETC Measuring Sector

**Background/Discussion:** The Sector was asked to develop a proposed date and location for the next meeting. The Sector agreed that holding the meeting in conjunction with the SWMA is still acceptable.

**Decision:** *The Sector agreed to recommend to the NTEP Committee that the next Sector meeting be held in conjunction with the 2010 Southern Weights and Measure Association meeting, which is tentatively scheduled to be held in South Carolina. The NCWM is asked to communicate with the SWMA regarding its past difficulties booking lodgings for the Sector meetings and ask for assistance to prevent these difficulties in the future.*

### **Additional Items as Time Allows:**

The NCWM S&T Committee would appreciate input from the Measuring Sector on the following measuring-related issues on its agenda. If time permits, the Measuring Sector was asked for comments on these issues. In the interest of brevity, the narrative for each item was abbreviated. Full descriptions of the items can be found in the S&T Committee's 2009 Interim Report and 2010 Interim Agenda.

#### **8. G-S.1. Marking (Software)**

**Source:** NCWM S&T Committee

**Purpose:** This item is included on the Sector's agenda to allow for the Sector to review proposed changes to NIST Handbook 44 General Code paragraph G-S.1. Identification and provide comments to assist the NCWM S&T Committee in its deliberations on these proposals.

**Background:** The S&T Committee is considering changes to NIST Handbook 44 General Code paragraph G-S.1. Identification to better address software-based systems. The Committee has considered multiple proposals under this item.

**Recommendation:** A copy of the most recent proposal to modify G-S.1. was included in the 2009 Sector Agenda (see also the 2009 Final S&T Report). The Sector was asked to provide input to the S&T Committee on this issue.

**Discussion:** During the 2009 Sector meeting, Steve Patoray (Consultants on Certification) noted that an updated version of the proposal from the Software Sector is now available. In the more recent version, software-based devices must have a version number for both built-for-purpose and not-built-for purpose devices. The version number can be included in a "look-up" menu. A serial number could be required for a built-for-purpose device. Additional work is being done on definitions and the Sector is encountering a significant amount of opposition from the general weighing industry whose members hold a large number of CCs.

Will Wotthlie (MD) commented that the previous version of the proposal (prior to the one with the most recent modifications) was reasonable. The latest changes by the Software Sector include requirements for hard marking which do not seem reasonable.

**Decision:** *While the Sector briefly discussed this item, it did not have comments to offer the S&T Committee.*

#### **9. G-S.8.1. Access to Calibration and Configuration Adjustments, Proposed Changes to Language**

**Source:** NCWM S&T Committee

**Purpose:** This item is included on the Sector's agenda to allow for the Sector to review proposed changes to NIST Handbook 44 General Code paragraph G-S.8. Sealing and associated paragraphs and provide comments to assist the NCWM S&T Committee in its deliberations on these proposals.

**Background:** The S&T Committee has considered multiple proposals to modify and expand NIST Handbook 44 General Code paragraph G-S.8. Provision for Sealing Electronic Adjustable Components and associated subparagraph G-S.8.1. Multiple Weighing or Measuring Elements that Share a Common Provision for Sealing. The Committee agreed that if a device designed for commercial applications is capable of being "sealed" while leaving available either external or remote access to the calibration or configuration mode, it is clearly in violation of the current G-S.8. Provision for Sealing Electronic Adjustable Components and General Code paragraph G-S.2. Facilitation of Fraud and, therefore, no change to the existing language is needed. However, because of the ongoing disagreement on the interpretation of G-S.8. among the NTEP laboratories, the Committee agreed to make changes to the proposal based on the concerns raised during multiple open hearings.

Although multiple iterations of proposed language have been submitted, reviewed, and discussed, at the 2009 NCWM Interim Meeting, the Committee concluded that the item is not ready for a vote. However, the Committee

decided to maintain the item on its agenda in anticipation that language would be developed by the 2010 Interim Meeting.

During the 2009 NCWM Annual Meeting, the S&T Committee received comments during the open hearing that no action may be needed and that the existing language in HB 44 is sufficient. Additional comments indicated that other proposals are overly complex. Oregon and Maryland believe that amended requirements for sealing are needed by the NTEP labs and field officials in order to consistently interpret and apply sealing requirements.

The Committee believes that all parties agree with the intent of the proposal. Both the WMD and SMA proposals include language that restates the existing language in G-S.8., but is essentially reformatted for clarification. Additionally, both proposals include new requirements for providing indications when a device is in adjustment mode. WMD proposed further language to address devices that may have more than one method of sealing.

**Recommendation:** Proposals considered by the Committee were included in the 2009 Sector agenda (and are also available as part of the S&T Committee's 2009 Interim and Final Reports). The Sector was asked for technical input on this issue that could be provided to the S&T Committee to help them in their assessment of the proposed changes.

**Discussion:** The Sector briefly discussed this issue, giving examples of how the requirements in paragraph G-S.8. have been applied to measuring devices. Steve Patoray (Consultants on Certification) noted that some weighing devices could be left in the calibration mode even though a physical security seal has been affixed and he further commented that the term "effective" has been questioned in discussions on this issue.

Most Sector members agreed that the Sector and NTEP measuring labs have consistently understood and applied the criteria in paragraph G-S.8. Will Wotthlie observed that, if the Sector sends a statement to the S&T Committee, it should say measuring devices either cannot function in the calibration or configuration mode or it should not be possible to seal the device while in that mode. Will gave the example of the mechanical temperature compensators that must be deactivated in order to reapply a security seal; this is considered an acceptable means of security and it complies with paragraph G-S.8. He also noted that the measuring laboratories have been consistently applying this requirement. Will Wotthlie noted that clarification is needed so the weighing labs are consistent in applying these requirements. Even though paragraph G-S.8. is relatively clear, he would suggest only changing a few words for clarification.

**Decision:** *The Sector reviewed the proposed changes to General Code paragraph G-S.8.1. currently under consideration by the NCWM S&T Committee. The Sector agreed that measuring devices with NTEP CCs have been evaluated to either:*

- 1) *not function in the calibration or configuration mode;*
- 2) *not be sealed in the calibration or configuration mode; or*
- 3) *clearly indicate the device is in the calibration or configuration mode.*

*The Sector agreed that these options reflect the intent of General Code paragraph G-S.8. and, because the intent of the paragraph is understood and appropriately applied by the measuring community, the Sector recommends that no changes be proposed to General Code paragraph G-S.8.*

## 10. Temperature Compensation for Liquid Measuring Devices Code

**Source:** NCWM S&T Committee

**Purpose:** This item is included on the Sector's agenda to allow for the Sector to review proposed changes to the NIST Handbook 44 Liquid Measuring Devices Code to address temperature compensation for retail motor-fuel devices and to provide comments to assist the NCWM S&T Committee in its deliberations on these proposals.

**Background:** The NCWM S&T Committee is considering a proposal to modify Section 3.30. Liquid-Measuring Devices (LMD) Code by modifying paragraphs S.2.6., S.2.7.1., S.2.7.3., N.4.1.1.(a) and (b), N.5., UR.3.6.1.1., and UR.3.6.1.2., to add new paragraphs S.1.6.8., S.2.7.2., S.4.3., UR.3.6.1.3., and UR.3.6.4., and to renumber other existing paragraphs as appropriate to recognize temperature compensation for retail devices.

Based on comments heard from the floor at the 2009 NCWM Annual Meeting, the S&T Committee acknowledged that additional work may be needed to specific sections of the proposed changes to the code. Points raised and discussed by the Committee include the following:

- There was a question of whether to reference “15 degrees C” or “15.56 degrees C.” The Committee agreed that industry practice has been to use “15 degrees C” and that this is the reference used internationally; consequently, they believe it should be kept as “15 degrees C.” This is also supported by the L&R Committee’s 2009 Interim Report which references a statement by the Meter Manufacturers’ Association indicating that 15 degrees C is used internationally and industry would likely follow that convention should SI units be used.
- Clarification is needed for the differences between wholesale devices and systems. In question were paragraph S.1.6.8. Representations from Devices with Temperature Compensation and paragraph S.2.7.2. Display of Temperature.
- Clarification is needed for how S.2.7.2. applies to electronic registers that can only indicate in terms of compensated quantities when the compensator is activated; the compensator would need to be activated and an additional run completed in order to view an uncompensated reading.
- Review the use of the term “invoice” and consider if the term is well understood for retail transactions which have typically used terminology such as “printed receipt” or recorded representation.
- Review the language in the VTM code under Item 331-2 and consider where changes might be needed to ensure consistency for the conditions and period of use for this feature.

The Committee decided to keep the status of this item as an “Information” item and acknowledges that some jurisdictions are already facing the imminent possibility of temperature-compensated retail motor-fuel equipment in their jurisdictions. The Committee believes that these standards are necessary whether or not the issue of a model method sale regulation is adopted in NIST Handbook 130 since weights and measures jurisdictions may decide to permit this equipment based upon their individual State laws or regulations.

**Recommendation:** Proposed changes to the Liquid-Measuring Devices Code currently under consideration by the NCWM S&T Committee were included in the 2009 Sector agenda (and are also available as part of the S&T Committee’s 2009 Interim and Final Reports). At its 2009 meeting, the Sector was asked for technical input on this issue that could be provided to the S&T Committee to help them in their assessment of the proposed changes.

**Discussion:** Dmitri Karimov (Liquid Controls) noted that he questioned how paragraph S.2.7.3. would apply with regard to the simultaneous display of net and gross volumes, particularly for equipment that delivers multiple product types and product types under both compensated and uncompensated conditions. Other Sector members agreed that paragraph S.2.7.3. as modified would not require simultaneous display of net and gross volume. The Sector agreed that the gross and net volumes should not be required to be simultaneously displayed.

Will Wotthlie encouraged manufacturers to carefully review the proposed changes to ensure that the changes would not negatively affect their equipment. By identifying changes early in the process, this can avoid having to revisit the requirements after they have already been adopted in Handbook 44.

The Sector also had a great deal of discussion on proposed paragraph UR.3.6.1.1. Use of Automatic Temperature Compensation regarding temperature compensator and nontemperature compensated meters where the delivery is temperature compensated. Will Wotthlie (MD) suggested that a search needs to be done for the terms “retail” and “wholesale” to ensure that they have been inserted or deleted as appropriate to reflect the expanded application. A related question was raised by Henry Oppermann (Weights and Measures Consulting) regarding how revised paragraph UR.3.6.1.3. Recorded Representations (Invoices, Receipts, and Bills of Lading) (formerly numbered UR.3.6.1.2.) was intended to apply in applications where the sale is to the end user.

**Decision:** *The Sector discussed the proposed changes to the LMD Code to recognize temperature compensation for retail motor-fuel devices, particularly paragraph UR.3.6.1.1. Use of Automatic Temperature Compensation; however, it had no specific comments to forward to the S&T Committee.*

### 11. T.2.1. Tolerances – Vehicle-Tank Meters (VTMs)

**Source:** NCWM S&T Committee

**Purpose:** This item is included on the Sector’s agenda to allow for the Sector to review proposed changes to the tolerances in NIST Handbook 44 Vehicle Tank Meters Code paragraph T.2.1. Automatic Temperature-Compensating Systems devices and to provide comments to assist the NCWM S&T Committee in its deliberations on these proposals.

**Background:** The S&T Committee continues to consider the following proposed changes to decrease the ATC tolerances on VTMs.

**T.2.1. Automatic Temperature-Compensating Systems.** – The difference between the meter error (expressed as a percentage) for results determined with and without the automatic temperature-compensating system activated shall not exceed:

- (a) ~~0.40~~0.2 % for mechanical automatic temperature-compensating systems; and
- (b) ~~0.20~~0.1 % for electronic automatic temperature-compensating systems.

The delivered quantities for each test shall be approximately the same size. The results of each test shall be within the applicable acceptance or maintenance tolerance.

**(Amended 201X)**

The Committee requested data (in addition to that provided by the submitter) to be submitted in either support or opposition to the proposed changes. At the 2009 Annual Meeting, the Committee reported that it received additional VTM test data from the State of Maine. This data supports the proposed change to the tolerances; the change would not impact the compliance rate for the devices included in these tests. The Committee noted that to date it has received only data in support of the proposed change.

The Committee heard opposition from the Meter Manufacturers Association and received a letter from David Rajala (Veeder-Root) expressing similar concerns over the proposed change to the tolerances. Both expressed concerns over the test procedures and test equipment that might be used by some jurisdictions, noting that, should non-NIST traceable thermometers or improper test procedures be used, the proposed tolerances would be too small.

**Recommendation:** The Committee asks for additional input from the Measuring Sector regarding these proposed changes. Data in support or opposition of the changes would be appreciated.

**Decision:** *Time did not permit the Sector to discuss these proposed changes. Consequently, the Sector took no position on this proposal.*

### 12. Water Meters – Test Draft Sizes, Repeatability Tests, and Tolerance Values

**Source:** NCWM S&T Committee

**Purpose:** This item is included on the Sector’s agenda to allow for the Sector to review proposed changes to the NIST Handbook 44 Water Meters Code for test draft sizes, repeatability test criteria, and tolerances values and to provide comments to assist the NCWM S&T Committee in its deliberations on these proposals.

**Background:** The S&T Committee has reviewed multiple proposals to modify the test procedures and tolerances associated with testing water meters under NIST Handbook 44 Section 3.36. Water Meters Code. These proposals were included on the Committee’s 2009 agenda under Information Item 336-3 N.3. Test Drafts and N.4. Testing Procedures and Developing Item. The water meter manufacturers who submitted the proposed changes have expressed concerns that the test draft sizes for some tests are not adequate and may result in erroneous test results.

These manufacturers are also proposing that the test procedures and draft sizes be aligned with the standards of the American Water Works Association (AWWA).

At the 2009 NCWM Annual Meeting, the S&T Committee reported receiving additional data from the water meter manufacturers; a comparison of current H44 requirements, AWWA standards, and the proposed changes; comments from NIST WMD; and excerpts from corresponding international standards.

The above information as well as correspondence between the water meter manufacturers and the S&T Committee is available upon request from the Sector technical advisor and S&T Committee technical advisor, Tina Butcher.

The Committee recently received eight additional alternate proposals from five water meter manufacturers. These proposals are being discussed between the five manufacturers, the State of California Division of Measurement Standards (represented on the S&T Committee by Kristin Macey), and several California counties (including 2010 S&T Committee Chairman, Brett Saum, San Luis Obispo County, CA). The S&T Committee anticipates receiving an update of these eight revisions from the fall regional weights and measures associations.

**Recommendation:** The Sector was asked to provide any comments regarding this issue to the S&T Committee.

**Decision:** *Time did not permit the Sector to discuss these proposed changes. Consequently, the Sector took no position on this proposal.*

### 13. Draft Code Section 3.3X. Hydrogen Gas-Measuring Devices

**Source:** NCWM S&T Committee

**Purpose:** This item is included on the Sector's agenda to allow for the Sector to review a draft code being proposed for inclusion in NIST Handbook 44 to address commercial hydrogen gas-measuring devices and to provide comments to assist the NCWM S&T Committee in its deliberations on these proposals.

**Background:** The NCWM S&T Committee's Agenda added a new item to its Developing Item in 2008 to recognize work being done to develop a code for commercial hydrogen gas-measuring devices by the U.S. National Work Group (USNWG) for the Development of Commercial Hydrogen Measurement Standards. The Work Group, which presently includes weights and measures officials, manufacturers and users of hydrogen measuring devices, and federal agency representatives, continues to look for input and participation from the weights and measures community in the development of the code and associated test procedures. The most current version of the draft code can be found on NIST WMD's home page at <http://ts.nist.gov/WeightsAndMeasures/Developing-Commercial-Hydrogen-Measurement-Standards.cfm>. This web page is a resource for the U.S. weights and measures and hydrogen community regarding the latest information and status of ongoing work to develop uniform and appropriate legal metrology standards for commercial hydrogen measurements.

At its August 2009 meeting, the USNWG on Hydrogen agreed that the code is ready to propose for adoption as a tentative code, with the caveat that some additional verification needs to be completed over the coming months to validate the proposed tolerances and test notes.

**Recommendation:** This item was included on the Sector's agenda to make the Sector aware of the work and to encourage input and participation from Sector members. A copy of the most recent draft code was provided to the Sector for reference.

**Decision:** *Time did not permit the Sector to discuss these proposed changes. Consequently, the Sector took no action on this item. This item was included on the Sector's agenda to make the Sector aware of the work and to encourage input and participation from Sector members.*