



**WHPA Goal 2: CQM Standard 180 User Guide (T) Working Group
Tuesday October 24, 2017 Meeting Notes**

Call to Order

The meeting was called to order at 10:02 am PDT by Marc Pickett, Chair.

Roll Call

The Chair considered one member of each organization to be a voting member for this working group. 9 of 16 voting members in attendance would constitute a quorum. 7 voting members, 2 non-voting members, 1 guests and 1 staff were present for a total of 11 attendees.

P = Present at meeting A = Absent from meeting; if proxy has been assigned it will be noted below. Although Voting Members have been designated by Staff, this group acts primarily by consensus.				
CQM User Guide Working Group Voting Members				
ACCA (Air Conditioning Contractors of America)	Donald	Prather	Contractor Association	P
Aire Rite AC & Refrigeration	Don	Langston	Contractor (Nonresidential)	
AMS (American Mechanical Services) Chair	Marc	Pickett	Contractor (Nonresidential)	P
ASHRAE Vice-Chair	Rick	Danks	Engineering Society	P
Charles Segerstrom, Energy Efficiency Consulting	Charles	Segerstrom	Energy Efficiency Program Consultant	
CLEAResult (formerly PECEI)	Todd	Van Osdol	California IOU	
GWP (Goodheart-Willcox Publisher)	Sandy	Clark	Educator, Trainer	
Honeywell E&ES, Commercial Buildings, Trade	Michael	Lawing	Controls (Manufacturer or Distributor)	P
HSE (Honeywell Smart Energy Solutions)	Shayne	Holderby	Energy Efficiency Program Consultant	
National Comfort Institute	Jeff	Sturgeon	Educator, Trainer	P
SCE (Southern California Edison)	Scott	Higa	California IOU	
Tre' Laine Associates	Pepper	Hunziker	Energy Efficiency Program Consultant	P
Western Allied Corporation	Mike	Gallagher	Contractor (Nonresidential)	
XCSpec	Janet	Peterson	Controls (Manufacturer or Distributor)	P
CQM User Guide Working Group Non-Voting Members				
Air Management Industries	April	Yungen	Contractor (Nonresidential)	P
Brownson Technical School	Bill	Brown	Educator, Trainer	
CLEAResult (formerly PECEI)	Michael	Blazey	Energy Efficiency Program Consultant	
FDSI (Field Diagnostic Services Inc.)	Dale	Rossi	Third Party Quality Assurance Providers	
HSGS (Honeywell Smart Grid Solutions)	Steve	Varnum	Energy Efficiency Program Consultant	
PG&E	Christian	Weber	California IOU	
SCE (Southern California Edison)	Steve	Clinton	California IOU	P
Warren Lupson and Associates	Warren	Lupson	Other Stakeholder	
CQM User Guide Working Group Non-Voting Guests				
Adrienne Thomle, Consulting**	Adrienne	Thomle+		
LCE Corporation - Little Caesar's **	Wendy	Gallo+		
SMUD (Sacramento Municipal Utility District)	Brett	Korven	Publicly Owned Utility	P
WHPA Staff (Non-Voting)				
BBI (Better Buildings Inc.)	Mark	Lowry	WHPA Executive Advisor/BBI COO	
BNB Consulting/WHPA Staff	Bob	Sundberg	Energy Efficiency Program Consultant	P (scribe)
Empowered Solutions/WHPA Staff (WHPA Co-Director)	Shea	Dibble	Energy Efficiency Organization	

** Organization is Not a Member of the WHPA; + Individual is NOT Registered with the WHPA; ^(P) after last name = Member/Registrant is Pending Approval from the WHPA Executive Committee

To avoid repetition, the name of the member organization will not be repeated in the body of the minutes past the first identification with the name of the representative participant.



**WHPA Goal 2: CQM Standard 180 User Guide (T) Working Group
Tuesday October 24, 2017 Meeting Notes**

Welcoming and Member Introductions

Brett Korven - SMUD. Brett is the new SMUD representative who will replace Bruce Baccei.

Approve Previous Meeting Draft Notes

The September 12 meeting draft notes were distributed September 30. Members were asked to provide any additional suggested revisions or corrections after which approved and finalized meeting notes would be posted to the WHPA website by Bob Sundberg. All attending voting members approved meeting notes via email vote. Finalized notes will be posted to the WHPA website.

ACTION Items

None.

New Business – Marc Pickett, Chair

None.

AGENDA

Topic	Discussion Leader	Desired Outcome
Welcome, Roll Call, Member Introduction, Approve Past Meeting Notes, Review Action Items, New Business, Meeting Agenda	Bob Sundberg, WHPA Staff Marc Pickett, Chair	Record attendees, welcome any new members, approve previous meeting minutes, review status of any open Action items, planned agenda and bring up any new business items for the WG to consider addressing.
Re-Calibrate 2017 WG Goals	Marc Pickett	Re-confirmed 2017 WG goals.
Goals/Metrics list	Marc Pickett, Chair Bob Sundberg, staff	Review, update goals/metrics draft list
Measurement, Data Collection and Report Making (UG Topic #5)	Marc Pickett, Chair	Agreement on how to pursue this user guide topic, next steps, sequence and assignment for next 3-4 meetings for WG work product
Confirm next meeting date/time, assign actions and proposed agenda and adjourn.	Bob Sundberg, WHPA Staff, for Don Langston, Chair	Clear understanding of member responsibilities for the next meeting. Next meeting date/time established.

Re-Calibrate WG 2017 Goals – Marc Pickett, Chair

Conclusion from 2016 CQM STD 180 User Guide Working Group final report:

This document was made to think through some key parts of Standard 180 and to document the experience of various stakeholders when selling and implementing Standard 180-based maintenance. The next step is to start producing the User Guide. The story arc of the proposed User Guide might be:

1. Introduction to and overview of Standard 180
2. Selling Standard 180-based maintenance
 - a. The value proposition
 - b. Qualifying the customer
 - c. The sales process
3. Making a maintenance program
4. Implementing a maintenance program
- 5. Measurement, data collection, and report making**
6. Validating Standard 180-based maintenance



WHPA Goal 2: CQM Standard 180 User Guide (T) Working Group Tuesday October 24, 2017 Meeting Notes

7. Conclusion

Marc Pickett, Chair – he had reviewed WG meeting notes from earlier in the year and concluded that the WG, since he'd assumed the chair position, had tried to address a far larger portion of the overall user guide plan than the WG had originally decided based on the Roadmap agreed to earlier that year. Of the “chapters” or sections of proposed user guide, the WG had decided in February and early March to focus on chapter 5. Measurement, data collection and report making. This focused goal was detailed in several of the March meeting notes – the following was shared online with meeting attendees.

WG Roadmap

Feb 23 – Finalize work plan and roadmap – stay at higher level and concentrate on “what” rather than “how”

1 - Mar 2 – defining performance objectives for customer facing reporting

2 - Mar 9 – categorize data types

3 - Mar 16 – categorize data collection methods

4 - Mar 23 – categorize useful calculations

5 - Mar 30 – categorize useful outputs and descriptions

6 - Apr 6 – categorize useful comparisons and conclusions

7 - Apr 13 – Write introduction

8 - Apr 20 – Write conclusion

9 - Apr 27 – Final document review and debate

10 - May 4 – Final document review and vote

The earlier efforts of the WG had reached decisions about tackling an annual customer facing report for which maintenance program goals had been established. Also, that unless it was deemed irrelevant, the reporting needed to address at least one performance objective (goal) for each of the purposes (goals) stated in Standard 180 – energy efficiency, thermal comfort and indoor air quality. Additional goals agreed to would also need to be addressed in the annual reporting. This was spelled out in the March 2 meeting notes.

Marc Pickett, Chair – he'd concluded that Step 1 “defining performance objectives” was the initial establishing of maintenance program goals which he believed was already being addressed in Jan Peterson's User Guide Customer Communications WG. He proposed their WG focus on the next five, steps 2 through 6 (bolded above). He thought all of those would fall within the arena of “metrics” and key performance indicators which the WG had been discussing for several meetings. But, this was the structure within which those discussions should have taken place. To move ahead, they needed to begin writing about what specific data they would suggested could support some general and other specific program goals. They'd discussed a lot but hadn't really nailed down what some of those items were.

The WG then looked at details of Standard 180 Section 4 where 4.2 described performance objectives and condition indicators. They confirmed their understanding that the performance objectives related to overall maintenance program goals/objectives. The condition indicators related to HVAC system operation and, more so, to maintenance tasks detailed in Section 5 of the standard.

Jeff Sturgeon, NCI – reminded the group of their earlier review of the CPUC and SCE customer studies conducted in 2011 by EMI which clearly benchmarked and provided priority rankings for benefits/goals of maintenance by building owners as well as facility managers. The standard stated three primary goals needed to be established as a minimum for compliance. But, the EMI studies provided great insight into a broader range of goals most highly regarded by end users and those responsible for facilities. He thought the maintenance program really needed to be based on the goal set of the responsible party. The study revealed that customers wanted to know more about reduction of capital expenditures and goals like lengthening the life of equipment and goals beyond the three primary goals of the standard. Some even wanted to achieve the highest energy efficiency possible. What he thought they needed was a kind of matrix to help determine that specific party's goals. The FORWARD of the standard did address many of those



WHPA Goal 2: CQM Standard 180 User Guide (T) Working Group Tuesday October 24, 2017 Meeting Notes

broader goals but also clarified that going beyond the minimum requirements of the standard was not a requirement of the standard.

Marc Pickett, Chair – he agreed with Jeff and concluded that the group had gotten into some real controversy around just that point. What was required by the standard and what were important goals beyond those minimum requirements which the user guide should or should not address.

Jeff Sturgeon, NCI – meeting the broad goal of achieving energy efficiency or occupant comfort, they would need to provide help in how to establish suggestions for the actual measurements that would be taken and reported on. The pain points and goals of several specific market segments was addressed in the 2016 User Guide WG final report. He thought that the framework for that matrix was already identified.

Rick Danks, ASHRAE – he didn't think that the context for establishing customer goals was the context as complying with the standard. From the ASHRAE perspective, Standard 180 was written as a minimum standard. The examples provided in the appendix section were "non-normative" examples only and not requirements of the standard. There was nothing wrong with the tangential activities of the WG regarding development of a value proposition but, in his opinion, these were not related to compliance with the standard. But, they could be related to the business imperative of the WHPA, which was just fine. The business concerns and establishing other goals for the maintenance plan might not comply with Standard 180 as currently published. Reliability and other goals beyond Standard 180 requirements. The value proposition got into the "how" of a maintenance plan was outside the scope of the standard, in his opinion. Those sorts of suggestions were above and beyond a minimum standard, but there was no requirement to take on those additional goals or practices.

Bob Sundberg, WHPA staff – he asked Rick Danks whether many of the goals, program performance objectives, which Jeff Sturgeon referred to from the EMI studies, would fall under the umbrella of the three larger purposes/goals stated in the standard? Were many of them either directly related to or reasonable outcomes expected from larger goals like energy efficiency or occupant comfort? Energy efficiency was a very broad term. Couldn't equipment reliability fall under that as a more detailed aspect? Keeping equipment running was a basic aspect of having the equipment run efficiently.

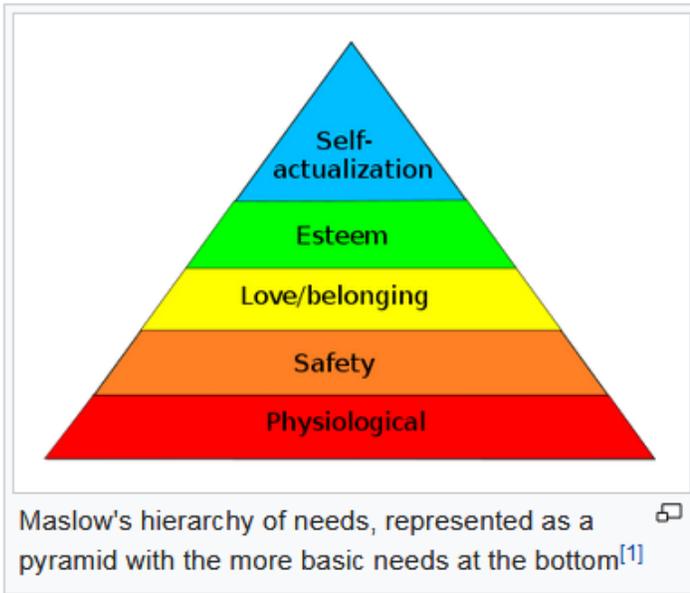
Rick Danks, ASHRAE – the FOREWARD addressed that question. Authors of the standard recognized reliability and similar goals. But, there were no specific goals established that required them to be in compliance with the standard. You'd be fine to establish those additional goals as long as the description in Section 4 was complied with.

Todd Van Osdol, CLEAResult – asked Rick Danks whether the three stated purposes/goals of Standard 180 were prerequisite to establishing other goals?

Rick Danks, ASHRAE – agreed with Todd's statement. There would have to be goals for those three purposes established to comply with the standard. But, additional related goals could be placed under any of those three very broad goals. Reliability was about the stickiest one for him. If the AC system was broken, it didn't provide any energy efficiency, but it also didn't, then, provide any thermal comfort for occupants. Anything more specific goal which addressed one of those three purposes was good. The standard was also silent on any priority of goal achievement. He did not believe that success or equal progress on all goals was the intent of the standard. One or more goals might be considered a higher priority. Incremental progress over each time-period toward other goals not yet achieved was considered compliance.

Bob Sundberg, WHPA staff – the purposes stated in the standard seemed to be fairly broad statements. He asked Rick Danks to help provide the WG with a better understanding of the intended meaning of those purpose statements since they were not formally defined in Section 3 of the standard. Those terms could easily be understood differently by those trying to understand and implement the standard.

Rick Danks, ASHRAE – those terms might be defined in other ASHRAE documents. He'd have to research that to provide an answer. He had in mind that a goal, at the end of a year of tracking, would be to lower the number of BTUs per square foot of occupant space below an established benchmark. This would be an indication of the impact of the maintenance program on the overall efficiency of the HVAC system. He had in mind the sort of pyramid, hierarchy of needs or goals, developed by Abraham Maslow. The more basic needs at the bottom needed to be met before the higher-level needs could be addressed. The hierarchy of needs was often expressed in pyramid form.



https://en.wikipedia.org/wiki/Maslow%27s_hierarchy_of_needs

Rick Danks, ASHRAE – he pictured a similar pyramid with an overall energy efficiency or energy index like BTUs/sqft at the summit with sub-goals underneath at the lower levels. Goals by facility or even by floors in larger tenant or office building. Energy use in year zero could be X, a benchmark, with the goal being to have energy use at the end of a year as X – (lower).

Todd Van Osdol, CLEAResult – asked Rick whether the Standard 180 goals were selected because they were supported by other existing ASHRAE standards? Standard 55 for comfort, 62.1 and 62.2 for IAQ and 90.1 for energy? Todd didn't know of any ASHRAE standards which supported goals like equipment reliability that came up in the EMI studies. He thought it might be useful for the user guide to suggest that implementers refer to other ASHRAE standards for guidance. In that way, other goals, like some referenced in the EMI studies, might be considered in the context of occupant comfort, energy efficiency and IAQ.

Rick Danks - he recalled that in 2006 and 2007 ASHRAE gave Bob Baker and the committee those three goals and impressed on them the urgency to get a standard based on them out. Rick only knew that these had been the goals given to the committee by leadership at that time. He liked the way that Todd was trying to connect the dots. He thought that Todd's was a good approach toward implementing the standard. As a minimum standard, he would not expect anyone to spend extensive effort in trying to detail compliance with those other and more specific new building standards. Keep in mind that those other standards were focused on the design and construction phase of a building life cycle. Those standards might be more applicable during a building HVAC system re-commissioning effort that during normal maintenance activities.



WHPA Goal 2: CQM Standard 180 User Guide (T) Working Group Tuesday October 24, 2017 Meeting Notes

Todd Van Osdol – he thought that many of the EMI study benefits/goals could be rolled up under one or more of the Standard 180 objectives. Lowering utility bills could be linked to improving energy efficiency. Reducing comfort complaints would fit under improving occupant thermal comfort. IAQ and occupant comfort would be overall goals addressed through a more detailed goal like increasing employee productivity. There are other EMI study goals which he wasn't certain could be placed under any of the standard's three purposes. Reducing repair costs might be linked to something like improving comfort conditions or IAQ. But, he'd concluded that adjacent goals like reducing capital expenditures and repair costs should be secondary to primary goals.

Rick Danks – upon reflection, he offered the argument that there was a direct link between reducing repair costs and reducing the carbon footprint of a building which was an indication of energy efficiency. Technicians completing repairs would have an immediate impact on improving system operational efficiency. With sufficient latitude, you could fit any one of the EMI study benefits/goals under one of those three purpose statements.

Mike Lawing, Honeywell E&ES – we should do that. Construct the matrix Jeff had described with one or more of the Standard 180 purposes/goals supporting each of those EMI study benefits/goals.

Marc Pickett, Chair – he proposed adding to their goals the development of a matrix, the listing described by Jeff and Mike to provide a visual display of the linkage between a range of more detailed facility goals and one or more of the three primary purposes/goals stated in Standard 180. That matrix could also be extended to include suggested metrics for those more detailed goals which was in line with the examples being worked on in the User Guide Customer Communications Working Group. Mark motioned to have the group add the metrics, which would later be categorized, to indicate which goals/objectives of the standard they supported.

Jeff Sturgeon, NCI – seconded the motion. Also, seconded by Donald Prather.

Bob Sundberg, WHPA staff – vote results. All voting members in attendance voice voted AYE except for Tre' Laine Associates which abstained. No NAY votes were cast. The motion passed.

DECISION – the group agreed to produce a matrix which would list facility maintenance benefits/goals, state which one or more of the Standard 180 overall goals/purposes it supported and state suggested metrics which might be developed for that goal.

The following draft list had previously been distributed to WG members.

Standard 180 User Guide – Maintenance Program Goal Metrics List

Caution – do NOT confuse maintenance program “performance” goals/metrics with HVAC system/unit “performance” goals/metrics

Maintenance Program Goals (primary sought benefits) - ** = top 5 goals/benefits in EMI 2011 Studies

- Decreased environmental impact / “green company image”
- Decreased repair costs **
- Extended unit life / delayed capital expenditure **
- Improved employee productivity
- Improved equipment reliability / reduced downtime **
- Improved occupant safety / reduced liability
- Improved “customer” environment
- Improved thermal comfort (STD 180)
- Increased indoor air quality (STD 180)
- Improved energy efficiency (STD 180)
- Minimizing the total cost of HVAC ownership
- Lower utility bills (overall, electric, gas, water etc.)

- Reduced energy consumption **
- Reducing the number of unplanned repair calls **

Top Maintenance Program Benefits (Goals) Sought – EMI/SCE Focus Group Study (2011)

- Improved equipment reliability / reduced downtime
- Reduced energy consumption
- Reducing the number of unplanned repair calls
- Extended unit life / delayed capital expenditure
- Decreased repair costs

Maintenance Program Goal Metrics (benchmarking progress)

- Service calls per month (seasonalized)
- Response time from phone call to tech arrival
- Number of repeat calls for similar issues without service company management involvement
- AC down time (count/number of times/yr. or total hours downtime?)
- HVAC system related costs
 - Maintenance contract costs
 - Service/repair costs
 - Replacement/capital expenditure costs
 - HVAC related energy costs
 - System upgrade/improvement costs
- Repair costs (perhaps per season, or perhaps per year)
- Number of serious repairs/yr. (> \$\$\$\$00) (similar to: frequency of unscheduled repairs/serious ones)
- Occupant complaints
 - Temperature complaints – might establish an acceptable temperature range/window for a given space and monitor actual readings over time
 - After hours calls received by property management staff attributable to AC
- HVAC related energy costs
 - Review/compare energy usage/costs over time for previous years to current, raw and normalized for seasonal/weather variation
 - Consider goals for energy consumption (kWh), demand charges (kW) or both

Measurement, Data Collection and Report Making – Marc Pickett, Chair

Marc Pickett, Chair – that decision brought the group full circle back to where the meeting began. The decision to focus their future efforts on Chapter 5 of the proposed user guide:

5. Measurement, data collection, and report making

Once they detailed program performance objectives/goals, linked each to Standard 180 overall purpose statements/goals and added suggested metrics for each, the WG would need to address the details of what data needed to be collected for each metric, how it would be collected, stored and how it would be used in reporting. The group would need to be careful to not confuse maintenance program performance objectives/goals Section 4.2.2.a with Condition Indicators described in Section 4.2.2.b. Condition indicators were intended to identify unacceptable system and HVAC equipment conditions that could lead to HVAC system performance degradation or failure. Both sections used the term “performance” but the WG’s current efforts were focused solely on maintenance program performance objectives, not HVAC system operations, though both needed to have metrics established to be tracked and reported on in some fashion. Marc thought that tackling Section 4.2.2.a was a big enough challenge for the WG to take on.

Rick Danks, ASHRAE – he offered to provide a copy of the Standard 180 draft work in progress for relevant parts of the standard to help reduce confusion. His only condition was to have this document limited to use by this WG and was not to be re-distributed to anyone outside the WG. He knew that the WG had previously decided that their user



WHPA Goal 2: CQM Standard 180 User Guide (T) Working Group Tuesday October 24, 2017 Meeting Notes

guide development efforts would be based on the published 2012 version of the standard. He thought it would be timely and helpful for WG members to gain an understanding of the current intent of the Standard 180 Committee.

The WG was very interested to review the draft copy and its substantial revisions.

ACTION: Rick Danks committed to providing Bob Sundberg with a copy for distribution to WG members/guests. Bob Sundberg committed to distribution of the document to all WG members/guests with a caution that the document was not to be redistributed.

Attendees verbally agreed and thanked Rick for his willingness to provide a document with insights about the current state of the standard.

Closing Comments/Adjournment

Bob Sundberg, WHPA staff – he suggested having a vote regarding this set of meeting notes immediately following their distribution. There was uncertainty about who would be maintaining the WHPA website after termination of the WHPA staff services. If attending members approved these meeting notes after distribution, they could be posted to the WHPA website as a current record of their activity and intentions. He proposed having a meeting notes email vote sent out right after the notes distribution. If four or more of the seven attendees approved the notes, he'd have a finalized copy posted to the WHPA website.

Marc Pickett, Chair – he committed to continuing to chair and lead future WG meetings, manage the WG roster and be the primary author for the WG work product. When and how future meetings would be announced and supported would depend on what resources Don Langston could provide. How meeting notes would be recorded, distributed and posted was yet to be determined. It would depend upon proposals of the new HVAC Stakeholder Engagement Strategy Committee and how the WHPA would evolve without the current IOU funded staff support structure.

He and several other attendees thanked Bob Sundberg for his Working Group support.

No future meetings were scheduled.

The meeting was adjourned at 11:04 am PDT.

* * * * *

Action Items and Key Decisions

October 24, 2017 **DECISION** – the group agreed to produce a matrix which would list facility maintenance benefits/goals, state which one or more of the Standard 180 overall goals/purposes it supported and state suggested metrics which might be developed for that goal.

October 24, 2017 **ACTION:** Rick Danks committed to providing Bob Sundberg with a copy for distribution to WG members/guests. Bob Sundberg committed to distribution of the document to all WG members/guests with a caution that the document was not to be redistributed. **COMPLETED.**



**WHPA Goal 2: CQM Standard 180 User Guide (T) Working Group
Tuesday October 24, 2017 Meeting Notes**