



WHPA Goal 2: CQM Standard 180 User Guide Working Group Thursday February 2, 2017 Meeting Notes

Call to Order

The meeting was called to order at 10:05 am PST by Dale Rossi, Chair of this working group and a representative of Field Diagnostic Services Inc. (FDSI).

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. 8 voting members, 0 non-voting members, 0 guests and 1 staff were present for a total of 9 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	
Air Management Industries	April	Yungen	Contractor (Nonresidential)	
Aire Rite AC & Refrigeration	Don	Langston	Contractor (Nonresidential)	P
AMS (American Mechanical Services)	Marc	Pickett	Contractor (Nonresidential)	
Charles Segerstrom, Energy Efficiency Consulting	Charles	Segerstrom	Energy Efficiency Program Consultant	P
CLEAResult (formerly PECEI)	Todd	Van Osdol	California IOU	P
FDSI (Field Diagnostic Services Inc.)	Dale	Rossi	Third Party Quality Assurance Providers	P
GWP (Goodheart-Willcox Publisher)	Sandy	Clark	Educator, Trainer	P
Honeywell E&ES, Commercial Buildings, Trade	Michael	Lawing	Controls (Manufacturer or Distributor)	P
HSGS (Honeywell Smart Grid Solutions)	Shayne	Holderby	Energy Efficiency Program Consultant	
National Comfort Institute	Jeff	Sturgeon	Educator, Trainer	P
Richard Danks Consulting - FacilityPro	Richard	Danks	Other Stakeholder	
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)	
Warren Lupson and Associates	Warren	Lupson	Other Stakeholder	
CQM User Guide Working Group Non-Voting Members				
BELIMO	Darryl	DeAngelis	Controls (Manufacturer or Distributor)	
BMI (BuildingMetrics, Inc.)	Pete	Jacobs	Energy Efficiency Program Consultant	
CLEAResult (formerly PECEI)	Michael	Blazey	Energy Efficiency Program Consultant	
CLEAResult	Mike	Withers	Energy Efficiency Program Consultant	
HSGS (Honeywell Smart Grid Solutions)	Steve	Varnum	Energy Efficiency Program Consultant	
SCE (Southern California Edison)	Steve	Clinton	California IOU	
UC Davis EEC (Energy Efficiency Center)	Kristin	Heinemeier	Research Organization	
CQM User Guide Working Group Guests (Non-Voting)				
Adrienne Thomle, Consulting**	Adrienne	Thomle+		
Fresno Unified School District	Frank	DiLiddo		
Little Caesar's **	Wendy	Gallo+		
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.



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Welcoming and Member Introductions

Attendees were welcomed. There were no new guests or members.

Approve Previous Meeting Draft Notes

The October 6 meeting draft notes were distributed October 13. Finalized meeting notes would be posted to the WHPA website by Bob Sundberg.

ACTION Items

July 18 ACTION: Todd van Osdol would talk with Scott Higa about how they thought the implementation of AB 802 might have an impact on their program and about how they might consider addressing the energy use reduction sort of performance objective which Dale Rossi described. Ongoing.

Update: Todd indicated that there were ongoing discussions about how to conduct, gather and analyze meter data for program participants. That would require additional program costs. Future program design revisions were still under consideration.

Some online sources on this topic:

http://aceee.org/files/proceedings/2016/data/papers/12_410.pdf

<https://web.stanford.edu/group/peec/cgi-bin/docs/events/2011/becc/presentations/3%20Disaggregation%20The%20Holy%20Grail%20-%20Carrie%20Armel.pdf>

<http://www.kdd.org/kdd2016/papers/files/adp1036-batraA.pdf>

http://nilmworkshop.org/2014/proceedings/perez_nonintrusive1.pdf

New Business – Bob Sundberg

None.

AGENDA

Topic	Discussion Leader	Desired Outcome
Welcome, Roll Call, Member Introduction, Approve Past Meeting Notes, Review Action Items, New Business, Meeting Agenda	Chair, WHPA Staff	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.
ASHRAE STD 180 Committee Meetings Update	Dale Rossi	All members would understand what was discussed and/or decided at the Standard 180 Committee meetings.
User Guide WG 2017 Planning	Dale Rossi	Discuss what sorts of data, valuable evidence and documentation could be provided to clients in support of Standard 180 based maintenance. Frequency of reporting and client meetings.
Confirm last meeting date/time, assign actions and proposed agenda and adjourn.	Dale Rossi, WHPA Staff	Clear understanding of member responsibilities for the next meeting. Next meeting date/time established.

ASHRAE/ACCA Standard 180 Committee January Meeting Update – Dale Rossi

Dale Rossi – a few days before the meeting, committee members were provided with what Dale thought was a completely re-written standard. Dale went to the committee meeting with 22 specific questions regarding the revision draft. It was a large group with lots of discussion and other points raised. All points didn't get discussed or resolved. The questions were sent back to appropriate committee working groups – Section 3 WG and Section 4 WG which was also responsible for the standard's introduction. Don Langston was a lead for the Section 4 group. A goal was established to have a revision draft completed by March, ½ way to the next committee meeting.

Examples:

- There was a portion of Section 4 focused on performance objectives but no clear agreement as to what the term “performance” meant.
- Also, what did “condition mean” in the discussion about condition indicators.

User Guide Working Group Planning – Dale Rossi

Dale Rossi, FDSI and Chair – he proposed a short-term agenda of establishing the long term 2017 objectives for the WG. Their goals would be to complete the outline and some progress milestones by February 28. He understood their 2017 overall task to include:

1. Making a maintenance plan
2. Implementing a maintenance program
3. Measurement, data collection, making progress/status reporting and validation
4. Introduction and conclusions for their work product

Dale Rossi

1. Maintenance plan

- Select a task list from Section 5 tables for each type of equipment
- Create condition indicators for each individual piece of HVAC equipment or groups of similar equipment to determine whether operation is acceptable or not
- Develop the process to be followed when condition indicators indicated unacceptable performance or operation

2. Implementing a maintenance program

- Establish an inventory for the equipment to be maintained with a unique identifier for each piece of equipment and a complete enough description to understand its use and application in order to select the right task list
- Create performance objectives to define what the program was intended to achieve (goals)
- Establish maintenance plans for each individual unit or groups of HVAC equipment
- Establish metrics for how that would be measured, how the data would be collected
- Regularly established client meetings or a reporting process to review and compare program performance against their goals

Don Langston – it remained a big challenge to try and get clients to talk about and establish maintenance program goals and access to energy and other related maintenance costs and not just about contract pricing. To help those discussions, he normally laid out some plan examples to walk through and choose from. He also included examples of included materials and how he proposed to handle fault or unacceptable condition communication as we as examples for goals. He'd recently met with SCE customers who were completing the three-year program. It was especially important to have a record for what they'd achieved with the expiration of the program incentives that subsidized maintenance contract costs. It was a challenge to get customers to re-sign agreements after exiting the subsidized program at full costs.

3. Measurement, data collection, reporting and validation

- Obtaining authorization to access client's building electrical meter data (AMI meter data)

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Dale Rossi – the group would need to decide and write up a description for just what they intended to accomplish for each task, an outline to cover all of them. Whether they were going to provide examples and/or produce templates for “how to” do these things. Then, decide how much time they intended to spend on each area. They might need to de-scope some parts if they discovered the task was much more involved and time-consuming that they’d expected. Their goal would be to have a work product document written at the end of each section or topic.

1. Maintenance Plan – Dale Rossi

Dale Rossi identified what he thought were the essential elements for a maintenance plan.

1. Select a task list from Section 5 tables for each unit or type of equipment
2. Create condition indicators for each individual piece of HVAC equipment or groups of similar equipment to determine whether operation is acceptable or not
3. Develop the process to be followed when condition indicators indicated unacceptable performance or operation

Don Langston added materials covered under the agreement, scoping of the work which included check, clean and inspect. Also, a proposed process when they found faults or faulty operation.

Dale Rossi brought up a topic discussed at the Standard 180 Committee meetings. Whether repairs needed to be covered to be compliant with the standard or not. There were strong opposing opinions. What was maintenance if it didn’t include fixing things. Others argued that with fixed price maintenance agreements, unknown repairs needed to be charged separately. Repairs had to be quoted and approved before additional resources were authorized to complete repairs.

Don Langston summarized that maintenance was, indeed, handled in a variety of ways. Repairs could be included, if that was what was discussed and agreed to with a client under a full coverage contract. Maintenance within the industry was more commonly considered the check, clean and inspect and report lower cost approach. Minor repairs within a set limit might be included as a hybrid approach. Don’s firm came up with their maintenance contract costs by allocating a set amount of time to all the tasks included in the agreement.

Dale Rossi added that the standard was defined as a “minimum standard” which to him meant it could not include any major repairs or equipment replacement upon failure. If repairs were a requirement of the standard, no contractors would meet the standard because few customers would buy it.

Dale Rossi – the maintenance task lists were pretty well established and just needed to be selected as appropriate for each piece of equipment. Not every task in each list might be necessary or appropriate for specific equipment. You really needed to go through the task list and identify which tasks to keep and which were not relevant, like steam traps, for example.

Dale Rossi – each task needed a condition indicator established composed of 1) establishing the type of inspection (visual, measurement, etc.) and 2) how it would be determined if the condition was acceptable or unacceptable.

Don Langston – he shared the condition indicators listed in the standard appendix and that these were examples of fault conditions that needed to be communicated when found. He thought that how you handled fault communication with customers was very important. Customers might want to be contacted via email, on a work ticket, called or some other form. It was important to determine how the customer wanted to be contacted about fault conditions and poor performance.

Dale Rossi – he didn’t see condition indicators in the standard itself, just the examples provided in Appendix B. There were tasks in the RTU Table 5-22 regarding the condenser coil, checking for leaks and another for coil fouling. In his mind a condition indicator might be a metric in a utility program like if the coil was fouled more than 20%, that the condition was now unacceptable. He considered that to be a program issue, but it was not in the standard itself. He asked, where did Don find condition indicators in the standard?

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The group discussed Appendix B. Building pressure was discussed. Abnormally low or high pressure could be considered a condition indicator but by itself it did not establish what was a normal condition and at what measured point the condition would be considered abnormal and unacceptable. The introduction to this section indicated that these statements were not strict requirements of the standard as stated but were simply examples of conditions. Section 4 required that the maintenance plan establish specific and customized condition indicators, visual or measured, for each condition to establish a condition indicator that particular system.

Don Langston – his firm listed those conditions and condition indicator points for unacceptable conditions in their tasking. Their technicians received training on over and under pressurized buildings. You had to start somewhere with customers to provide a framework around these unacceptable conditions and then establish parameters for technicians to follow. He used Appendix B in their training to locate points where they could start talking with their customers about maintenance issues.

Bob Sundberg, WHPA staff – wasn't the point of developing a user guide to flesh out the conditions indicated in Appendix B and provide some concrete examples of how to write condition indicators, those points where a condition had become unacceptable especially for key performance objectives?

The group agreed.

Jeff Sturgeon, NCI – reminded the group of earlier WG efforts where the suggestion was made to attach a sticker or record to each unit once it was brought to a baseline condition to benchmark measurements or visual indications of acceptable conditions and performance. It could list the manufacturer target for no more than X pressure drop across a coil or other similar limit for acceptable conditions. If at follow-on maintenance calls the pressure was measured and found to exceed that manufacturer or other limit, it would be a clear indication of performance degradation. Having that baseline condition documented was a great help when he was a service manager in the field. They created a retro-commissioning document for every piece of equipment they maintained.

Dale Rossi – that sounded like a good way to proceed but also like more of a premium approach. Measuring pressure drops across coils and filters went beyond what he would expect most maintenance plans to include.

Don Langston – before his firm implemented their maintenance programs, they benchmarked the condition of all the units to establish where the equipment was at and an overview of total system performance. Then, they brought all the equipment as close to manufacturer's specifications as possible before setting out to maintain it at that level. That's when they'd place a sticker on each unit identifying baseline conditions to maintain. He liked the idea of retrofitting units in the field to a baseline level of operation and documenting it for ongoing comparison.

Dale Rossi – he agreed that one variation would be to accomplish most of that at the first full maintenance inspection.

Jeff Sturgeon, NCI – for years his firm had to sell that approach to differentiate themselves from the standard, minimalist approach for a maintenance contract which was in place just to satisfy owners.

Charles Segerstrom, Energy Efficiency Consulting – asked about the difference between repair and maintenance. He understood that completing repairs was not included in most standard maintenance agreements. He gave an example about a technician determining there was inadequate airflow.

Dale Rossi – he could think of two ways the standard would address that issue. The first would be if an unacceptable condition was discovered during a maintenance inspection, like low airflow or a refrigerant superheat target temperature, the current standard requires an investigation to determine the cause. The maintenance plan should include a method for remediating the condition, to conduct a repair in answer to the question Charles asked. The second would be where a condition might also have an impact on not achieving a performance objective such as having



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X number of days beyond acceptable space thermal comfort. At the end of some established interval, an investigation would need to be conducted to look into the issue to locate a cause.

Don Langston – there was a lot of flexibility in the standard depending on the scope of the actual agreement. Coil cleaning and other items might or might not be included for various reasons.

Dale Rossi – his service usually didn't include those types of service because he was convinced that condition indicators should determine when coils needed to be cleaned, for example. Cleaning a coil that was effectively transferring heat was not only a waste of a limited maintenance resource but also could affect the life of that coil. Periodic or annual cleaning of all coils was not his firm's approach. He based those types of services on a condition. If there was a higher a condenser over ambient temperature delta than expected, they would look into why. The only four reasons he knew of were a dirty condenser coil, a fan issue, an overcharged condition or non-condensables in the refrigerant. Dale described their fault trouble-shooting routine in detail. There was no point in cleaning coils which had expected and acceptable condition indications or temperatures.

Dale Rossi thought this almost described a Six Sigma process where you proposed a practice with expected results, conducted measurements and reviews through equipment conditions or performance objectives for the building to see if you got expected results and refined the process accordingly. The standard set up a framework to establish an initial plan, see how well it worked and modify the plan as needed. Approaches as well as task frequency could be expected to be modified over time. If objectives of the plan were not being met, the maintenance plan needed to be modified.

Develop the process to be followed when condition indicators indicated unacceptable performance or operation

Don Langston – his firm had a customer communication process in place any time unacceptable conditions were found. They also had a pre-approved budget level to immediately address smaller problems to avoid expensive delays for approval and additional service calls for small dollar repair issues. They gave owners some guidance and choices on the front end of designing their maintenance agreement.

Closing Comments/Adjournment

1. Making a maintenance plan
2. Implementing a maintenance program
3. Measurement, data collection, making progress/status reporting and validation
4. Introduction and conclusions for their work product

Dale thought the group had succeeded in covering the outline for making a maintenance plan but could add more detail later, if needed. They had three more meetings to outline the other three topics.

Dale thanked everyone for attending and suggested they meet the following Thursday February 9 at the same time, 10:00 am PST, to continue their outline planning for 2016.

The meeting was adjourned at 11:01 am PST.

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Action Items and Key Decisions

None.



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