



WHPA Goal 2: CQM Standard 180 User Guide Working Group Thursday August 11, 2015 Meeting Notes

Call to Order

The first planning meeting was called to order at 10:03 am PDT 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 new working group, He intended to work toward consensus on all decisions. 10 of 18 voting members in attendance would constitute a quorum. 7 voting members, 1 non-voting members, 2 guests and 1 staff attended 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 Maintenance Task 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)	Marc	Pickett	Contractor (Nonresidential)	P
BELIMO	Darryl	DeAngelis	Controls (Manufacturer or Distributor)	
BMI (BuildingMetrics, Inc.)	Pete	Jacobs	Energy Efficiency Program Consultant	P
Charles Segerstrom, Energy Efficiency Consulting	Charles	Segerstrom	Energy Efficiency Program Consultant	P
CLEARresult (formerly PECEI)	Michael	Blazey	Energy Efficiency Program Consultant	
FDSI (Field Diagnostic Services Inc.)	Dale	Rossi	Third Party Quality Assurance Providers	P
GWP (Goodheart-Willcox Publisher)	Sandy	Clark	Educator, Trainer	
Honeywell ECC, Commercial Buildings, Trade	Michael	Lawing	Controls (Manufacturer or Distributor)	P
HSGS (Honeywell Smart Grid Solutions)	Shayne	Holderby	Energy Efficiency Program Consultant	P
Marina Mechanical	Denny	Mann	Contractor (Nonresidential)	
National Comfort Institute	Jeff	Sturgeon	Educator, Trainer	
Richard Danks Consulting - FacilityPro	Richard	Danks	Other Stakeholder	
SCE (Southern California Edison)	Steve	Clinton	California IOU	
Tre' Laine Associates	Pepper	Hunziker	Energy Efficiency Program Consultant	
UC Davis EEC (Energy Efficiency Center)	Kristin	Heinemeier	Research Organization	
Western Allied Corporation	Mike	Gallagher	Contractor (Nonresidential)	
Warren Lupson and Associates	Warren	Lupson	Other Stakeholder	
CQM Maintenance Task Working Group Non-Voting Members				
CLEARresult	Mike	Withers	Energy Efficiency Program Consultant	
HSGS (Honeywell Smart Grid Solutions)	Steve	Varnum	Energy Efficiency Program Consultant	
SCE (Southern California Edison)	Todd	Van Osdol	California IOU	P
SCE (Southern California Edison)	Scott	Higa	California IOU	
CQM Maintenance Task Working Group Guests				
Adrienne Thomle, Consulting**	Adrienne	Thomle+		
Fresno Unified School District	Frank	DiLiddo		P
Little Caesar's **	Wendy	Gallo+		
NADCA	April	Yungen+		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.



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Welcoming and Member Introductions

Frank DiLiddo, Fresno Unified School District guest. School district energy manager for the past 15 years.

- The position had evolved from energy conservation through improved space use/behavior to proposing initiatives and measures to improve HVAC system energy efficiency to further reduce utility expenses but also to improve learning environments for students, teachers and staff as a top priority.
- Fourth largest school district in the state. Nearly 7.5 million square feet of conditioned space. Approximately 2500 packaged HVAC units plus chillers, boilers and other HVAC equipment.
- Staff of 14 HVAC union journeymen for 100 school sites and 15 admin buildings.
- PG&E QM program allowed the use of contractor and non-union services because of short duration and policy of not adding full-time staff for limited services like programs of this sort. Required discussion and agreement between all stakeholders.

<https://www.linkedin.com/in/frank-diliddo-48110b86>

Approve Previous Meeting Draft Notes

The August 4 meeting draft notes were distributed August 9. Finalized meeting notes would be posted to the WHPA website by Bob Sundberg.

ACTION Items

May 26 ACTION: Todd Van Osdol, SCE, agreed to get together with Scott Higa to locate and provide the group with examples of the reporting tools which the program provided customers and examples of reports delivered to customers. To be provided at WG meeting dealing with customer facing reporting, topic #5. Ongoing.

June 23 ACTION: Shayne Holderby, HSGS, would invite a school district energy manager to participate on a future WG conference call. He would also try to access that school districts Standard 180 based maintenance program documentation. Completed.

June 30 Key Decision: should the WG develop a second, parallel table of benefits to contracting firms that would result from their proposing maintenance based on Standard 180. Dale Rossi suggested they see if time permitted their addressing this additional market segment player.

STATUS: Not resolved.

New Business.

None.

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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.
Review 8/4 VP Matrix	Dale Rossi	All members would understand what was discussed and/or decided at the previous meeting and provide final revisions or corrections.
VP Matrix – Schools Market Segment (MUSH/institutional segments)	Dale Rossi	Hold a discussion with Frank DiLiddo, Fresno Unified School District regarding an end user’s perspective on possible benefits and barriers to adopting a Standard 180 based approach to commercial maintenance.
Set next 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.

User Guide Summary Outline – Dale Rossi

This working group (WG) decided that it would explore the following Standard 180 related topics. The WG intended to select one highest priority topic to focus on for most of 2016. When completed, they would select a next highest priority topic to pursue during the balance of 2016 or into 2017 dependent on WHPA allocated resources.

1. Understanding performance objectives and condition indicators
2. Making a maintenance plan
3. Investigating unacceptable conditions and performance
4. **Communicating the value proposition – selected as primary deep dive topic for 2016**
5. Customer facing reporting

Review Previous WG Meeting focused on National Accounts – Dale Rossi

No suggested revisions or corrections were offered by attendees.

Schools/institutional Market Segment – Dale Rossi

Market segment characteristics

Q Dale Rossi: the group is working on a group of related institutional market segments called MUSH – which included municipal, university, schools and hospitals. Did Frank believe that those buyers locate and consume HVAC services in a similar way?

A Frank DiLiddo: Yes, with minor exceptions.

- Schools outsourced services when beyond the school of work and budgetary limitations for their function working under public education guidelines. Each of those public entities would follow their own specialized guidelines.
- For schools, if the work, labor + material estimated cost, is below their guidelines, they accomplish the work with in-house staff. If projects were above the guideline limits, they outsourced the work. For this HVAC QM maintenance program, they did go out for bids. This required union consent because it was work which could have been accomplished in-house but was for a temporary program of limited duration. The district did not want to hire a full-time person for a temporary program which, when ended, would terminate those positions.

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- Their next challenge was to locate contractors who were not only capable but willing to dedicate staff to this school district's needs. New England Sheet Metal was selected as their HVAC contractor because of their willingness to expand staff to commit to this program's three-year period.

Decision-makers and the decision process

Q Dale Rossi: how did they go about getting a budget approved for this program?

A Frank DiLiddo: basically, they had to go to the board of education for approval. One of the hurdles was how to estimate costs. They weren't certain how many of all the district units would be addressed since, in a practical sense, they couldn't all be started at the same time. They had to estimate the repair costs or optional upgrades, like DCV (demand control ventilation) for participating units and didn't know for sure what sorts of repairs and upgrade costs they'd need. They had to draft board communication documents months before the work was expected to begin to allow board members time to digest the information and exchange questions and provide answers to issues they raised. Once approved by the board, the purchasing department would proceed with notices of awarded bids and procuring those services. Was the contractor still interested? Could they provide proof of insurance and bonding?

Q Dale Rossi: how did the idea for participating in this type of program come to the school district? What was considered in the decision to participate?

A Frank DiLiddo: the idea came from the PG&E business development rep. They'd previously been involved in the AirCarePlus PG&E program which he'd considered quite a failure. They had no choice in which contractor would perform the work, coordinating access to sites and HVAC equipment and they'd experienced contractors leaving work undone, incomplete, a mess. The contractor didn't have accountability to the district. They don't routinely just hand out access keys because of safety and vandalism issues and some facilities, "winged schools," had separate access staff and keys. They signed up for the program and were just assigned a contractor who'd been screened and approved by the utility – no say in the matter for the school district. In that program, they were "just the customer." In a large district when things don't go right, those issues flew up the chain of command to the top quickly, often skipping over the maintenance department entirely. For an AC issue, the call could end up in the superintendent's lap before anyone else had heard about it. In a pilot phase, they got to participate as both the contractor (HVAC staff) and customer and receive incentives for both to better understand how that structure worked. They realized that their limited staff couldn't undertake this scope of PM work for the entire district. With the contracting work being outsourced for the full program, getting incentives as a district and also the additional PM work performed by the contractor was quite attractive. Without the contractor incentives, this would have been a "no-go."

Q Dale Rossi: who were the decision-makers as well as the champion that made this happen?

A Frank DiLiddo: he was the champion. The ultimate decision-makers were the superintendent and the board of education. He had three levels of management above his position. He worked in Environmental Services, reported to the Service Maintenance Manager who reported to the Director of Maintenance and Operations. They reported to the Assistant Superintendent who reported, in turn, to the Superintendent. Not that many districts had a dedicated energy manager. Most and smaller districts just had a maintenance department where there could be a little friction or tension. Someone was coming in and checking their work which they thought was being done just fine within the resources made available. They wouldn't be as well positioned as an energy manager to champion energy efficiency measures and opportunities since they were directly responsible for operations. School districts would often be broken up into separate departments for electricity, plumbing, HVAC, buildings etc. Without an energy manager, it would be very difficult to vet and assess energy efficiency opportunities. He was in a position to make sure all stakeholders would have their input unlike districts which didn't have this coordinating function. In other districts you'd need to start with that maintenance manager.

Deterrents, barriers, push-back to participation

Q Dale Rossi: what kind of push-back did you experience within your organization?

A Frank DiLiddo: it wasn't so much "pushback" as determining the best way to roll it out, how they could procure it, how could they justify paying for it. It worked as long as the contractor was able to be paid out of the incentives the school district received. They originally arranged to pay a fixed amount per unit to the contractor which was difficult for them. The contractor didn't know what work each unit would need so the liability was sort of unlimited. They also didn't know what incentives the units would get because it depended entirely on what work was required to bring them to baseline condition. One initial contractor concluded that they couldn't see the long term benefit of participating. The cost for repairs was outside the scope of this program which all MUSH organizations would have to take into account. Frank learned that it took about \$300/unit on average to bring each into acceptable operational condition. 50 units would amount to about \$15K in expense just on the repairs, no maintenance or QM incentives applied to this work.

Key benefits to participation

Q Dale Rossi: were the potential energy savings benefits a significant motivator in your case?

A Frank DiLiddo: energy savings was definitely a part of the sales piece. It was a big part of how the program was being presented and sold. In reality, broken units weren't consuming energy or operating the way they should. Some power exhausts were disconnected. Some unit compressors had failed and not been repaired. When they were returned to service, they found that energy consumption actually increased. The savings they anticipated through advanced economizing was offset by having more units back in operation and running when they previously had not been in the past. In looking at real time data, they'd not seen significant savings so far.

Q Dale Rossi: the fact that you aren't seeing significant savings now, would that be an obstacle in the future with going ahead with this more comprehensive approach to maintenance with people in your organization?

A Frank DiLiddo: no. They wanted to be good energy conservation stewards and reduce utility costs. But, they also wanted to improve the learning environment in classrooms. The big piece for them was getting PM done on units. Getting more units running optimally was a bigger factor than the energy savings.

Documentation, resources, tools

Q Dale Rossi: did you have any way to gather data about increased comfort or those other non-energy benefits? Had they found a way to quantify or document those benefits? Had anyone asked him to do that?

A Frank DiLiddo: no, those benefits were tough to quantify because people all responded differently to a given condition. Quantifying feelings was difficult. You were talking about temperature, levels of humidity, rates of recycled air and all those variables.

Q Dale Rossi: he meant for about what % of the time a space might have met the target temperature setpoint. Not how people reacted to that setpoint. Did he have a way to measure and record what temperatures were in all of the classrooms, for instance? If they had a building automation system, did they ever create a metric to gather data against? Would that be of interest to those decision-makers?

A Frank DiLiddo: yes, they had an energy management system. He didn't know how you'd accumulate that data to produce those metrics. He expected there's would be more around how much energy was being used and saved before and after the changes. They could do metrics around comfort by tracking space complaints. But, those were hard to quantify and very subjective. They could track work orders. Again, they might or might not find that there is a real issue. In many cases it was a personal response even when the system was doing what was asked of it.

Q Dale Rossi: this whole approach to more specific performance objectives and data gathering and tracking doesn't seem to have much appeal or need in your case, does it? Do you anticipate someone going back and in detail trying to determine whether this was successful and worth the money?

A Frank DiLiddo: No, it doesn't. If they could have maximized the efficiency of units, over the long haul, maintenance for the unit should go down and it should extend its service life. Those would be costs and projected savings which would be difficult to quantify. They would be tracking units after being brought back to baseline condition to check on the frequency of additional repairs at the end of the three years. There would be a need to collect some data and analyze it. Right now the program was in its infancy and the little data that had wasn't showing any huge energy savings.

Williams standard for health and safety

Q Dale Rossi: was Frank familiar with this standard and how did they attempt to comply with it? Was the district concerned with compliance with it? Did concern about that standard play a role in a decision to participate in this QM program?

A Frank DiLiddo: broadly, if you considered that the standard was effected by efforts to improve their PM (preventive maintenance), yes it did.

Documentation, resources, tools

Q Dale Rossi: what kinds of documentation or record of success or best practices would be most helpful to convince the district to proceed with this approach after the incentives expired? What would help you to more easily sell continuing this practice to your superintendent and school board? Would any particular evidence, examples or case studies be valuable?

A Frank DiLiddo: The savings numbers were initially provided by PG&E. We'd have to see how ours actually came out. But, they did do a one site pilot to see what costs seemed to be for repairs and QM as a test run. The numbers for repairs and QM costs were in line with what they expected so we got agreement that it was something they could get more involved with in the full program.

General Q&A

Q Charles Segerstrom: from what you'd described, Fran, it appeared that the additional costs were covered 100% by the PG&E program incentives. If so, what would the value proposition need to be after three years and the expiration of those incentives to sell continuation of this maintenance approach with your superiors? What would it take to sell this approach on its own merits?

A Frank DiLiddo: maybe this program has brought to light many of the maintenance and service issues they haven't been able to take care of adequately with their current staff. They just didn't currently have the staff to maintain all of the HVAC systems at this level. They'd like to add permanent staff, if possible, and continue those practices outside of the program. The \$300/unit in repairs brought to light that they haven't had enough in-house staff to keep ahead of those necessary repairs which the program uncovered. So far, they'd only gone through 4 to 500 of the 2500 total units. Getting units operating properly, the program has revealed, had taken some of the load off of their current staff. If that practice was continued in-house by hiring more permanent staff, maybe they could reduce or avoid many of those repairs going forward with better maintenance. He didn't think they could ever sell the QM piece, the cost to bring failed units back up to normal operation. He still saw a barrier trying to hire full time journeyman staff for that part-time function for repairs and recommissioning units. He was hopeful that PG&E would continue this program over the next couple of years to allow getting more or all district units up and running. But, without that support, he didn't think the district would or could ever take on the part-time type of project with their limited full-time staff. School districts just couldn't. Their union agreement was to only hire journeymen, no apprentices. They had to know the amount of work was definite before any additional hiring could be approved. They couldn't project a cycle of four years in the future having the need to come back a bring those early program units back up to speed. Hiring more people to do this program internally, he thought that would never happen.

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Q Charles Segerstrom: again asked what value proposition elements would have to be in place for that to happen internally? If, over three years, this could be proven to be a viable long term approach, putting resources up front to work on packaged units proactively rather than reactively, the drivers, energy savings, learning environment and comfort would have to be documented sufficiently before district staff could be expanded.

A Frank DiLiddo: he couldn't anticipate ever hiring enough staff to cover all of the program elements. It was a union hiring issue in his mind. He couldn't anticipate having hired more staff and then, after three years, not having sufficient work to retain them when/if the PG&E program was no longer offered. A school district like theirs just couldn't do that. The program contractor was providing the PM on their behalf. That had taken some of the load off of their technicians who have had to focus almost exclusively on reactive work in the past. During the program, their staff might be able to be more proactive rather than solely reactive. It's almost as if that contractor has become a district employee. They'd provided people who were dedicated to school sites and wouldn't be pulled off their schools to chase someone else's emergency call. All the people New England Sheet metal hired were hired exclusively to serve this district under the PG&E program. Once those units were repaired, he thought most of them should be good for three or four years with only minor exceptions. This PM piece, to get units all caught up in just a few years, was a big selling piece for Jeff Friesen, their maintenance director.

<https://www.linkedin.com/in/jeff-friesen-b9422329>

With the large amount of conditioned space to manage, they did a considerable amount of fire-fighting to avoid having the superintendent being called any more often. People too often just went to the top with their complaint. In three years when a large portion of district units have been repaired (PM), they might just be able to do that tracking and reporting that was being discussed earlier. Frank anticipated that a lot of nuisance, no repairs required, false calls would be eliminated. They'd get to the real problem calls more promptly. Those were the kinds of savings, in addition to energy savings, that he hoped the program would deliver to justify the higher level of QM.

Q Bob Sundberg/WHPA staff: what rough percentage of all 2500 units would you estimate would get through the PM phase in this first three-year period?

A Frank DiLiddo: about two-thirds. He hoped they could get 100% of eligible units through but realistically thought that close to 2000 of the units could go through PM during the first year. Any remaining units would have to start that program entry in a new year if the program was extended. And, the program might be changed. He hoped that coil cleaning would be included in any future revision of the program which was not included in the current program and was pretty important for units to run efficiently. Right now New England was tackling only one school at a time but were ramping up their staff. Maybe they could move up to two schools being managed at one time going forward. Packaged unit counts ranged from five at some schools to over sixty since some schools had central plants and built up systems. That was another challenge of the getting the program started. It had to ramp up from zero. The follow-up annual inspections also were staggered all across the next year.

Q Michael Lawing: Frank, was there a way to correlate student/staff/teacher satisfaction, providing a healthy and comfortable environment, with an attendance metric? Could someone up the ladder be convinced that better IAQ was a contributor to higher attendance which would help justify more thorough maintenance?

A Frank DiLiddo: he knew there were studies out that evaluated the impact of clean environments on attendance. Asthma is an issue in the district as with many others in the valley with all the dust, agriculture and air quality in general. There are health conditions that have a direct impact on absenteeism. If a student is absent, the district loses money. They get paid on ADA – average daily attendance. The staff would probably know about specific classroom issues before it became too big. For that to be one of those soft metrics, we'd have to track ADA before and after at schools which had been brought up to baseline. That could be a correlation or contributing factor, but you couldn't conclude it to be the only cause. There could be other legitimate reasons for a decrease or increase in absenteeism.



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You'd have to conduct this at a significant number of schools and have the same findings at all of them to lend credibility that this one factor had this sort of impact. That would be a big selling point.

General discussion

Dale Rossi had to depart the meeting. Frank DiLiddo indicated that he could spend a few more minutes on the call to answer further questions.

Bob Sundberg, WHPA staff, oriented Frank to the VP Matrix which the group had been populating from a table laid out by Pepper Hunziker a few weeks before. With the detail which Frank was providing, it was obvious that each of the MUSH segments, municipals, universities, schools and hospitals, would have to be provided their own row because of their distinct differences. They also discussed the WG's focus on sections 3 and 4 of Standard 180 where establishing and implementing a maintenance program was dealt with, not section 5 with its more detailed equipment maintenance tasks. The group was developing a user guide intended both for the end user/responsible party and for whoever provided their maintenance services. The WG's intention was to produce a guide which would help translate the standard's intentions into more understandable terms with concrete examples to help users picture how they might benefit from and implement the standard to get the greatest value from it.

ACTION: remaining meeting attendees concluded that schools and each of the MUSH market segments should probably be grouped but given their own rows as the group collected more detailed information on each. The VP Matrix should be revised to reflect these sub-segments.

Frank DiLiddo indicated that it was very difficult to try and quantify really important elements of this program beyond just the energy data. Most schools had just one electric meter which made it difficult to break out the HVAC usage from the rest. And, trust had to be established even with a great contractor. Someone still needed to closely manage the project with all the cooperation needed between the school's staff and contractor's employees. Good communication was critical. He still needed to review and get approval for all proposed repairs. The school always retained the right to not approve them under certain circumstances. There was no carte blanche for PM/repair work. They had separate repair and QM purchase orders for each school because the QM portion was funded by the program incentive reimbursements. Not the case with HVAC repairs which were paid for directly by the district. He expected that in three years they'd be able to prove how much time and money this approach was saving the district on repair costs.

Bob Sundberg agreed and commented that from Franks detailed description, the group was also more aware that there were probably sub-sectors even within the school market segment. There were differences based on size, decision-making and management complexity as well as factors like union and non-union school maintenance staff.

Marc Pickett, AMS, shared that in one school district his firm had worked with on a QM program, the district had insisted that their staff also attend the NATE certification which a contracting firm service provider staff's would attend. He asked Frank whether the Fresno district would value that sort training to help their staff technicians get better qualified?

Frank DiLiddo replied that all school maintenance staff were already journeymen. They did, however, attend the full day of program process and documentation training. How QC worked, the schedules for maintenance and all the reporting requirements. Honeywell (HSGS), the program implementer, also helped conduct the district HVAC inventory and initial evaluations using their QC staff to determine which units were eligible for the program and which were not. The school district just didn't have the manpower to conduct that sort of function. And, they didn't put that work into their RFP which would further burden a prospective contractor with unpaid work. Later, the contractor would conduct more detailed inspections of each unit for which there were program incentives.

Frank indicated that as they made progress getting further into the program, he'd be happy to help this group in any way he could with more complete answers. Maybe he'd have more insights in six months to a year.



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Closing Comments/Adjournment

The next meeting was scheduled for Thursday August 11 at 10 am PDT. The agenda would be to focus on

The meeting was adjourned at 11:33 am PDT.

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Action Items and Key Decisions

August 11 ACTION: remaining meeting attendees concluded that schools and each of the MUSH market segments should probably be grouped but given their own rows as the group collected more detailed information on each. The VP Matrix should be revised to reflect these sub-segments.

August 11 Key Decision: the working group reached consensus that they would limit their 2016 effort by focusing on three key market segments (owner occupied, national accounts, MUSH/institutional) and develop others only as future time and resources allowed.