



Goal 2: Commercial Quality Maintenance Committee Tuesday November 8, 2016 Meeting Notes

Call to Order

The meeting was called to order at 10:04 am PDT by Don Langston, Chair and President of Aire Rite AC and Refrigeration. Meetings are normally scheduled for 60 minutes.

Roll Call

Quorum for voting organizations = 7 of 12. 5 voting members, 5 non-voting members and 4 guest and 1 staff attended this meeting. A total of 15 members, guests and staff attended.

P = present at meeting

A = absent voting member; if proxy has been assigned it will be noted below.

WHPA Goal 2: CQM Committee VOTING Members				Roll Call
ACCA (Air Conditioning Contractors of America)	Donald	Prather	Contractor Association	P
Aire Rite AC & Refrigeration	Don	Langston	Contractor (Nonresidential)	P
CLEAResult	Gretchen	Egging	Energy Efficiency Program Consultant	P
FDSI (Field Diagnostic Services Inc.)	Dale	Rossi	Third Party Quality Assurance Providers	P
Honeywell ECC (Commercial Buildings, Trade Sales)	Mike	Lawing	Controls (Manufacturer or Distributor)	
HSGS (Honeywell Smart Grid Solutions)	Shayne	Holderby	Energy Efficiency Program Consultant	
Marina Mechanical	Denny	Mann	Contractor (Nonresidential)	
PG&E (Pacific Gas and Electric Company)	Jeanne	Duvall	California IOU	
SCE (Southern California Edison)	Scott	Higa	California IOU	
SDG&E (San Diego Gas and Electric Company)	Jeremy	Reefe	California IOU	
Tre' Laine Associates	Pepper	Hunziker	Energy Efficiency Program Consultant	P
Western Allied Corporation	Mike	Gallagher	Contractor (Nonresidential)	
WHPA Goal 2: CQM Committee NON-VOTING Members				Roll Call
ASHRAE			Engineering Society	
BELIMO Aircontrols, Inc	Darryl	DeAngelis	Controls (Manufacturer or Distributor)	
Brownson Technical School	Bill	Brown	Educator, Trainer	
BuildingMetrics Inc. (BMI)	Pete	Jacobs	Energy Efficiency Program Consultant	
Clean Energy Horizons	Norm	Stone	Energy Efficiency Program Consultant	
CLEAResult (formerly PECEI)	Michael	Blazey	Energy Efficiency Program Consultant	
CLEAResult	Elizabeth (Liz)	DeSouza	Energy Efficiency Program Consultant	
CLEAResult (formerly PECEI)	Phil	Jordan	Energy Efficiency Program Consultant	
CLEAResult (formerly PECEI)	Paul	Kyllo	Energy Efficiency Program Consultant	
CLEAResult (formerly PECEI)	Mike	Withers	Energy Efficiency Program Consultant	P
Honeywell Smart Grid Solutions (HSGS)	Steve	Varnum	Energy Efficiency Program Consultant	
PG&E (Pacific Gas and Electric Company)	Christian	Weber	California IOU	
Richard Danks Consulting	Richard	Danks	Other Stakeholder	
SCE (Southern California Edison)	Steve	Clinton	California IOU	P
SDG&E (San Diego Gas and Electric Company)	Robert	Nacke	California IOU	



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SMUD (Sacramento Municipal Utility District)	Bruce	Baccei	Publicly Owned Utility	
Transformative Wave	Joe	Schmutzler	Controls (Manufacturer of Distributor)	P
Transformative Wave	Justin	Sipe	Controls (Manufacturer of Distributor)	
Lupson and Associates	Warren	Lupson	Other Stakeholder	P
XCSpec	Jeff	Aalfs	Controls (Manufacturer of Distributor)	
XCSpec	Janet	Peterson	Controls (Manufacturer of Distributor)	P

WHPA Goal 2: CQM Committee NON-VOTING Guests				Roll Call
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Adrienne Thomle, Consulting **	Adrienne	Thomle +		
AHRI	Garrett	McGuire	HVAC Manufacturer Association	P
Air Management Industries	April	Yungen	Contractor (nonresidential)	
AirTest Technologies	Mike	Schell	HVAC Manufacturer	
American Commissioning Group	Craig	Hofferber	Third Party Quality Assurance Provider	
AMS (American Mechanical Services)	Marc	Pickett	Contractor (Nonresidential)	P
California Public Utilities Commission (CPUC) - Energy Division	Carmen	Best	California PUC	
California Public Utilities Commission (CPUC) - Energy Division	Pete	Skala+	California PUC	
CLEARresult	Richard	Waite	Energy Efficiency Program Consultant	
Fieldpiece Instruments	Russ	Harju	HVAC Manufacturer	
Galawish & Associates	Elsia	Galawish	Energy Efficiency Program Consultant	
ICF (ICF International)	James	Jackson	Energy Efficiency Program Consultant	
Mark Cherniack Emeritus	Mark	Cherniack	Emeritus	
NADCA (National Air Duct Cleaners Association)	Dan	Stradford	Contractor Association	P
NCI (National Comfort Institute)	Rob	Falke	Educator / Trainer	
Pax-Sun Engineering, Inc.	Tom	Paxson	Other Stakeholder	
PG&E (Pacific Gas and Electric Company)	Robert	Davis	California IOU	
SCE (Southern California Edison)	Andres	Fergadiotti+	California IOU	
SCE (Southern California Edison)	Sean	Gouw	California IOU	
ServTEC Air Conditioning	George	Rodriguez	Contractor (Nonresidential)	P
UC Davis Energy Efficiency Center	Kristin	Heinemeier	Research Organization	
STAFF				
BBI (Better Buildings Inc.)	Mark	Lowry	WHPA Executive Advisor/BBI COO	
BNB Consulting/WHPA Staff, host, admin. support & scribe	Bob	Sundberg	WHPA Staff	P
CLEARresult	Paul	Kyllo+	WHPA Senior Advisor	
Empowered LLC	Shea	Dibble	WHPA Co-Director	

** 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



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AGENDA

Topic	Discussion Leader	Desired Outcome
Welcome, roll call, review agenda, approve past meeting minutes and ACTION items	Don Langston and Bob Sundberg/staff	Record meeting attendees, finalize past meeting minutes, review status of meeting action items.
Welcome new members & guests, review new candidates	Don Langston and Bob Sundberg/staff	New members and invited guests welcomed. Decision made on suggested revisions to candidate options and the review process.
NEWS – Regulatory and Legislative Updates	Don Langston, CPUC/ED, CEC & IOU Representatives	Members and guests are kept informed about new regulatory and legislative actions, events and announcements.
CQM Program Updates SCE/PG&E/SDG&E	Gretchen Egging, Shayne Holderby, Jeremy Reeve	Gain a current understanding of IOU CQM program status, progress, developments and issues.
CQM STD 180 User Guide WG Update	Dale Rossi	Members updated on WG status and progress of draft work product and Value Proposition Matrix
Committee Work Product - Customer Interview Process	Don Langston and Janet Peterson	Final member/guest input. Customer interview process intended to uncover and establish Standard 180 based maintenance program objectives and goals and means for measuring and reporting progress and status.
Review meeting Action Items, set next meeting date/time, adjourn	Don Langston	Set next meeting date and confirm time.

Approve Minutes of Previous Meeting

The October 11 meeting draft notes were distributed October 21. Approved meeting notes would be finalized and posted to the CQM Committee site.

Review Status of Action Items from Previous Meeting

September 2016 ACTION: Don Langston would re-organize the existing list of interview questions to use in a client maintenance program discussion later that day. He'd provide that grouped list to Bob Sundberg for distribution to the committee. Completed.

PAST ACTION ITEMS:

September 2015 ACTION: Scott Higa, SCE, would report progress on the testimonials and access to and analysis of customer energy data at the next monthly meeting. Ongoing.

Welcome New Members and Guests; Consider Pending Members

- Christian Weber – PG&E Energy Efficiency Senior Product Manager – California IOU. Christian was unable to attend and would be welcomed at a future meeting.



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New Business - Don Langston & IOU Representatives

Committee Work Products

October 27 planning meeting held to discuss common objectives of the committee work product and the User Guide WG work product. The decision was made to complete each separately to Executive Committee for 2016 and to continue efforts to merge the two efforts as the WG continued its efforts in 2017.

WHPA In-Person Leadership Meetings

The annual in-person meeting of the Executive Committee, Council of Advisors and Committee and Working Group Chairs would be held November 17 and 18 in Pasadena. He planned to inform attendees of all the solid work volunteers on this committee had been doing and an update on their work products. It would be a good opportunity to meet and talk with the other group leaders and to get informed about the other good work which was being accomplished.

NEWS Updates -Regulatory and Legislative - Don Langston, CPUC/ED, CEC & IOU Representatives

CPUC sponsored workshop Nov. 16.

The California Energy Commission will conduct a workshop to discuss and seek comments from interested parties regarding energy data collection to support the implementation of Senate Bill 350 (SB 350, de León, Chapter 547, Statutes of 2015), Assembly Bill 802 (AB 802, Williams, Chapter 590, Statutes of 2015), and improved California energy analytics.

Energy Commission Chair Robert B. Weisenmiller will conduct the meeting jointly with Commissioner Andrew McAllister. Chair Weisenmiller is the Lead Commissioner for electricity and natural gas issues. A quorum of Commissioners may attend but no votes will be taken. The public is invited to attend the workshop held on:

**Wednesday, November 16, 2016
10:00 AM**

California Energy Commission
1516 Ninth Street
Art Rosenfeld Hearing Room (Hearing Room A)
Sacramento, CA 95814
(Wheelchair Accessible)



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Remote Access Available by Computer or Phone via WebEx

Presentations and audio from the meeting will be broadcast via our WebEx web meeting service. For additional details on how to participate via WebEx, please see the notice at: <https://efiling.energy.ca.gov/getdocument.aspx?tn=214375>

Computer Log on with a Direct Phone Number:

Please go to <https://energy.webex.com> and enter the unique meeting number **929 290 672**.

A password is not necessary to join the meeting

For More Information:

<http://www.energy.ca.gov/sb350/energydata/documents/index.html>

IOU CQM Program Updates

SCE CQM program summary (Gretchen Egging of CLEAResult):

Gretchen Egging, CLEAResult, commented that they were getting closer to their 2016 goal of 5.0 kW in energy savings (incentives paid) with their hitting the 4.7 kW level. Their kWh energy savings goal was also on track for being met. She added that a little over half of the RTUs, 56%, participating had economizer system retrofits. And, there were 821 RTUs (units) YTD with demand control ventilation/variable frequency drive fan control upgrades (those with incentives already paid out). It looked like they would have a strong start in 2017 if the trend continued.

SCE CQM HVAC – October

	Oct-16	2016 YTD
New contractors	0	6
New customers - application received	7	71
New buildings – check cut	14	305
% of units w/ economizers	56%	56%
New tonnage – check cut	2,627	32,240
Units w/ CSA – check cut	152	3362
Units w/ DCV/VFD – check cut	15	821
Units w/ ADEC w/ CSA – check cut*	152	1479
kWh – check cut	864,480	12,187,658
kW – check cut	313.85	4,794.35

*does not count units with ADEC pre-existing at CSA or units where ADEC is installed at DCV



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PG&E CQM Program Summary (Jeanne Duvall of PG&E & Shayne Holderby of HSGS)

Most PG&E staff and HSGS staff were involved in planning meetings.

No update.

SDG&E CQM Program Update

No update.

CQM STD 180 User Guide Working Group Update – Dale Rossi

Dale Rossi, FDSI and WG Chair, reported that he continued to work on finalizing the WG's work product. He still had to integrate some comments and then edit/proof read and finalize the document. He reminded committee members that this document was developed as preparation for a user guide. It was not work on an actual user guide, yet. There were certain issues and topics the WG thought had to be worked through first. If a working group was supported in 2017, they would probably tackle developing a user guide first draft. He hoped that they'd have all of 2017 to work on that project, unlike in 2016 when WHPA and all committee and working group activities got off to a late start.

The group had elected to research five topics and decided to focus on #4 in 2016 and #5 as time permitted:

1. Understanding performance objectives and condition indicators
2. Making a maintenance plan
3. Investigating unacceptable conditions and performance
- 4. Communicating the value proposition**
- 5. Customer facing reporting**

Committee Work Product - Translating Performance Objectives into Value Propositions – Don Langston

Don Langston commented that the "user guide" would be made up of several sections. The work product of the full committee was focused on identifying performance objectives, goals. This work was intended to be done in parallel with Dale Rossi's WG effort and he thought would be part of a merged work product once a user guide was worked on the following year.

In his work with prospective clients, Don had worked mostly with larger and multilocation chains. He'd devoted a lot of the initial time trying to determine their real goals and whether they valued the results which a Standard 180 approach could provide where a maintenance program was based on defined goals.

The user guide would include content on how a contractor might work with their client to ferret out what goals were really important and how the maintenance program and contract could be structured to support accomplishing those goals.



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CQM Committee Goal #2

Committee/Working Group: CQM Committee

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Goal #2: Define Key Performance Objectives for Commercial Maintenance Incorporating AB 802 Elements and Translate into Customer Value Propositions. This would be captured in a matrix posted to the WHPA website by December 31, 2016.				
Milestone	Owner	Deliverable	Due Date	Dependencies
1. Define Key Performance Objectives for Commercial Maintenance	Chair and Committee Members	Key Performance Objectives	June 30, 2016	<ul style="list-style-type: none"> Availability of Chairs and Committee Members
2. Define Customer Value Proposition(s) for Each Identified Performance Objective	Chair and Committee Members	Customer Value Propositions	August 31, 2016	<ul style="list-style-type: none"> Availability of Chairs and Committee Members
3. Finalize Draft of Matrix	Chair, Committee Members, and WHPA Staff	Draft of Matrix	October 31, 2016	<ul style="list-style-type: none"> Availability of Chairs, Committee Members, and WHPA Staff
4. Committee Approves Matrix	Chair and Committee Members	Committee-Approved Matrix	October 31, 2016	<ul style="list-style-type: none"> Availability of Chairs and Committee Members
5. EC Approves Matrix	EC, Chair and WHPA Staff	EC-Approved Matrix	November 30, 2016	<ul style="list-style-type: none"> Availability of Chairs and Committee Members Time on Nov EC Meeting Agenda
6. Matrix Posted to WHPA Website	WHPA Staff	Document posted to WHPA Website	December 31, 2016	<ul style="list-style-type: none"> WHPA Staff Availability

Customer Interview Matrix, draft by Jan Peterson, XCSpec

Don Langston stated that he thought Jan had done a great job to collect and organize the many interview questions brought up in committee meetings and put them into flow charts to visually show what topics and issues needed to be addressed by the end user and their service provider. The intro comments and flow charts would help end users and contractors get a better sense of a joint process which was needed in order to get at those important goals.

Bob Sundberg, WHPA staff, commented that the standard stated that developing a set of performance objectives was a key requirement of the “responsible party” or owner to be in compliance with Standard 180. But, as this committee had noted often, the standard did a good job of stating requirements, but not how the requirements were to be met.

Jan Peterson, XCSpec, indicated that all of the questions were ones brought up by committee members. Don had asked her to try and organize them around a few common topics or problems that they were trying to solve. The charts were intended to give a visual overview of groups of related questions. They were not meant to be a script of any strict sequence of questions to be walked through rote. They were, more or less, charts to help give an idea of how you might extract information during a client dialogue. This was a “straw man” early draft. Her intent was to get members to comment and provide suggestions to improve the work product.

There were a number of informational questions that would be good to work through prior to any detailed face-to-face meeting. Background questions about the HVAC system, facility and its use, ownership, how maintenance related expenses were managed, budgeting and various costs including utility bills (energy usage), repairs and the current kind of maintenance plan. This was like homework to address ahead of time. And, there were real



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differences between customers and their building types and uses as Dale Rossi's WG had been working through. These general questions would help focus further client discussions for those more specific market segments.

Getting this information ahead of a face-to-face meeting would help in trying to drill down and determine client objectives. What that customer valued, what were their priorities and how they measured performance or success. Also, how committed they were or weren't financially to HVAC maintenance. Whether they understood the true cost of doing nothing or very little to maintain those systems.

Don Langston commented that a client willingness to gather or help gather the requested information like repair and utility costs ahead of time was an indication of their degree of interest or "skin in the game" regarding maintenance.

She summarized a group of basic questions intended to gather information ahead of a face-to-face meeting.

- Building Use? – Restaurant, office, (Dale Rossi WG building use, market segment breakdown here)
- Owner Occupied or Tenant?
- Building Age? – implies code level as well as age of equipment.
- Number of RTUs – use Google Map here
- What is the square footage of the space or building?
- Who are you talking with? Owner, Property management, Tenant responsible for HVAC service
- How are maintenance utilities paid? Triple Net? Single zoned HVAC?
- Do they know how much electricity bills are?
- Try to get copies of several years of utility bills in advance or to be reviewed at meeting.
- Is there a current maintenance program? Description? Past contract copy to review coverage

FACE to FACE Meeting –

You should have a set of clear objectives for this meeting. What they valued, how committed they were to system performance, how they supported maintaining their system financially and what idea they had about using metrics for evaluating how well their approach worked. Jan developed three flow charts, each around a group of related questions. You also wanted to cover the "cost of doing nothing" which many building owners hadn't considered and didn't know how to address.

There were three groups of questions that should be covered during a face-to-face meeting. Questions which could be addressed in any order or sequence, not like a strict questionnaire.

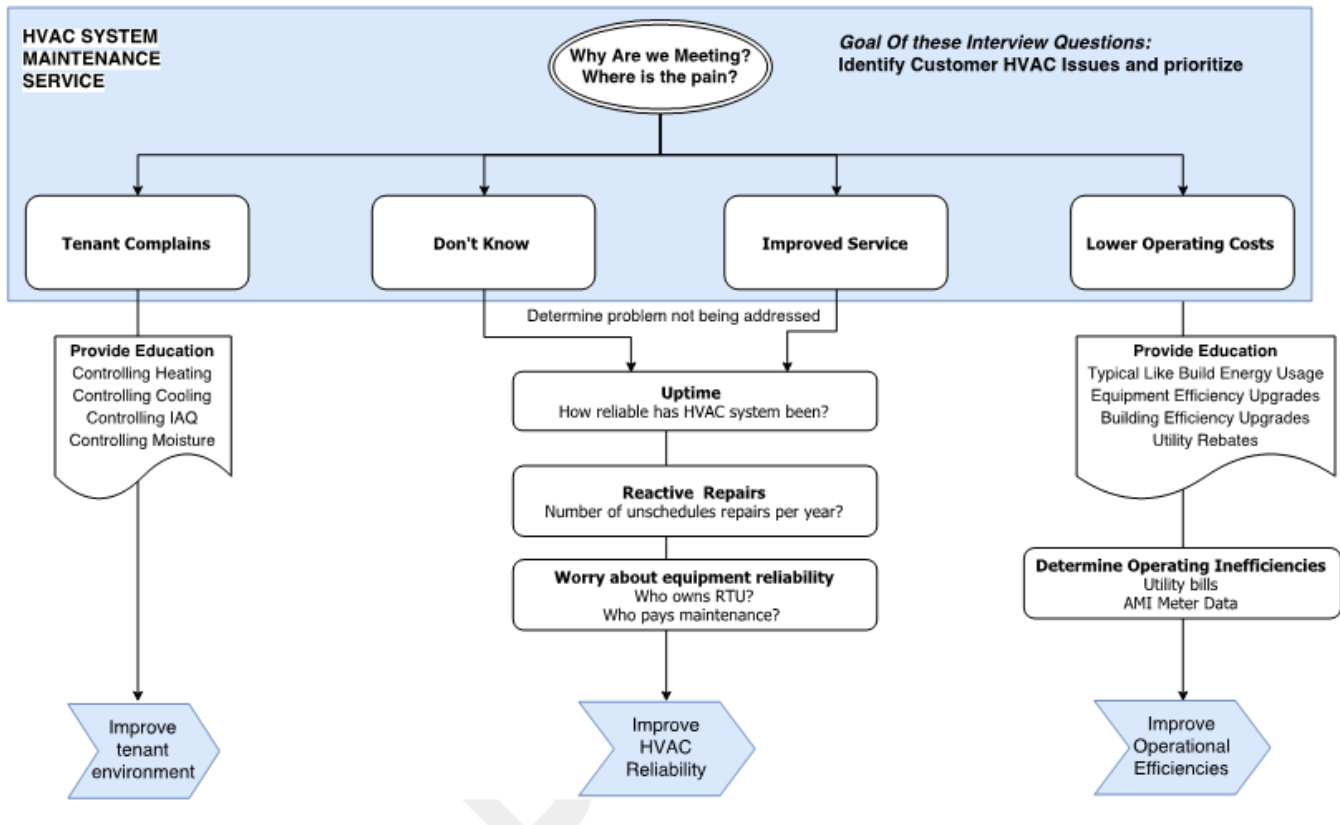
1. Determine customer's HVAC system priorities: The first questions determine customer's objectives and priorities. Coupling this with the information retrieved earlier this should scope the operational situation with the customer.
2. Determine budget and financial commitment: The second set questions determine customers financial objectives, priorities and budgets.
3. Determine customer metrics to measure HVAC performance and program effectiveness: The final set of questions determine the customer's metrics for measuring service success. This helps determine the sophistication of the customer and their system. Coupling this with the information retrieved earlier, this should help define how to set up the metric for a maintenance relationship and capture the data needed to determine the

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applicable evaluation metrics – whether ROI, Uptime, improved occupant comfort and others – for customer to evaluate results against expectations and goals.

1. The first chart set of questions dealt with HVAC system maintenance service priorities. The questions were meant to confirm why they were holding the meeting and whether the client was aware of problems or issues, the “pain.” The questions focused on building occupants and complaints, system reliability issues and HVAC operation related costs. Did they have a formal maintenance program in place now and how comprehensive it was. The goal was to confirm areas of issues and try to prioritize them. The financial questions would also get at how aligned their budget was with their expectations. A direct discussion about what it would take to have a system operate the way the owner wanted. Also, to get at who owned parts of the budget like capital expenses but maybe not utility costs. If someone owned the overall budget, what was its structure and how that organization made HVAC system related decisions.

SLIDE 1 – Identify customer HVAC issues and priorities

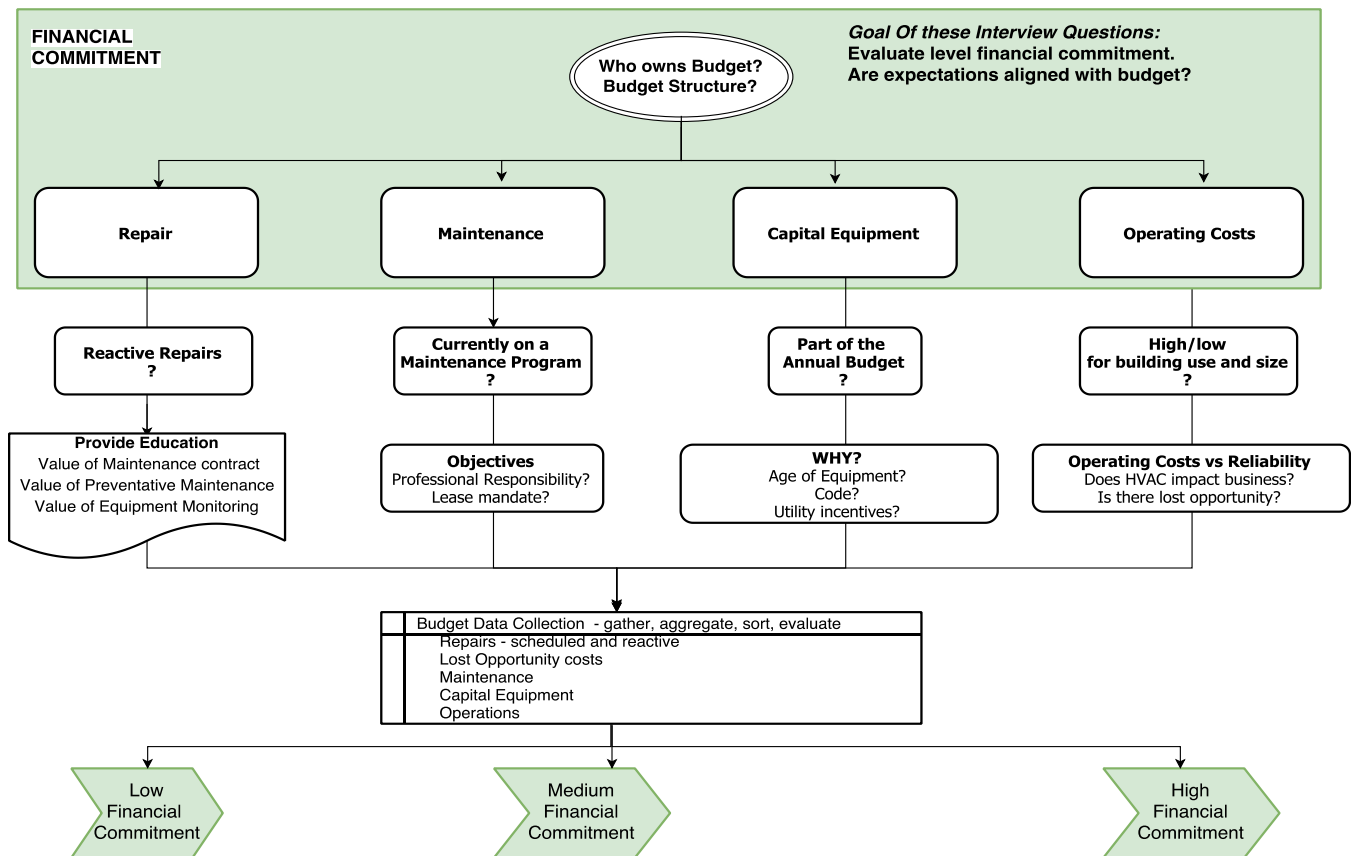


2. The second set of questions tries to get at how much money the customer currently has committed to HVAC system related expenses. Do they even know? How is their budget broken up? Basics are – what is the structure of their budget and who owns each portion? Was the maintenance and the repair budget all one or were they separate. How did they handle equipment failures and replacement? Did they have a separate capital equipment budget? Were they managed by the same people and how did one impact the other, or not? What about who owned that utility budget? Was that a third party or was it managed by one of the others? How did they regard the operating costs for their building? How did those costs

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compare to others of like building size and use? A service provider might have to actually talk to several individuals to get the complete picture and maybe to someone who had overall responsibility for any decisions. It was pretty important to get actual copies of these expenses in order to do any analysis to determine what their pattern for costs has been vs. what they've been spending. Again, to possibly uncover "unknown" costs of their current approach. You'd also want to get a copy of their current maintenance contract to get a better idea just how comprehensive it was or wasn't. Again, to get at their priorities and how much money they've committed to that approach. Were they losing tenants and that revenue as a result of poor HVAC system operation? Could that lost revenue be folded into a formula for a better return on investment by improving their approach to maintenance? This is an attempt to align their budget with the reality of what it delivered, including some lost opportunities.

SLIDE 2 – Identify how HVAC budget is structured, alignment with expectations, level of financial commitment



At the bottom, Jan drew a continuum for how they might place their financial commitment to HVAC system operations.

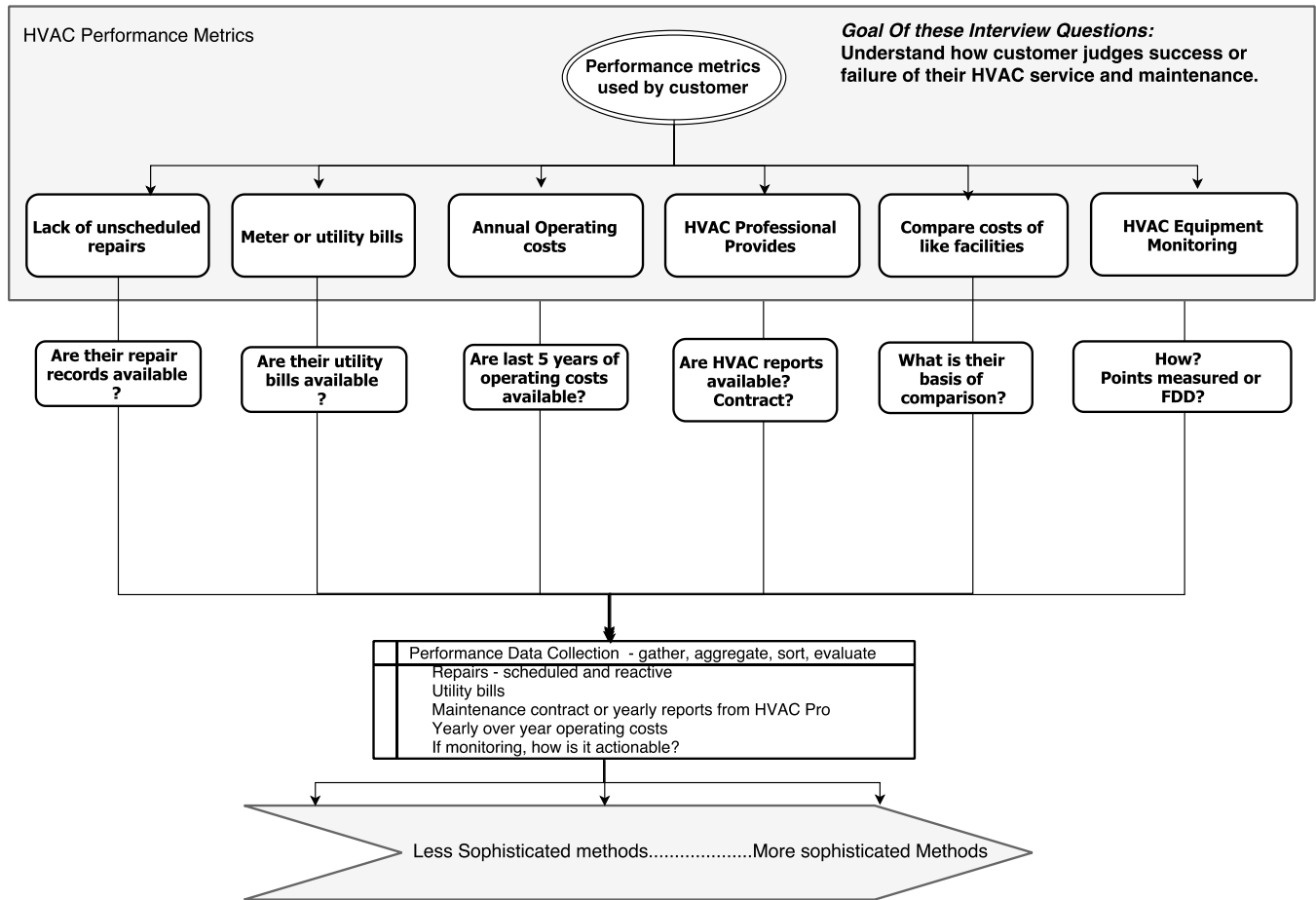
- The last flow chart focused on cost metrics that could be used to measure success and what their return on investment could be for quality maintenance. Did customers measure it at all, currently? Do they look at their meter? Do they note that there seem to be fewer or more unscheduled service calls and expensive

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repairs? What do they currently track, if anything? The service provider has to be concerned with there being ways to measure success if they come in and deliver maintenance.

An arrow continuum indicated the range of client sophistication from little to no maintenance being performed to buildings which could be using monitoring and advanced fault detection and diagnostics.

SLIDE 3 – Maintenance program metrics, how to judge success



SLIDE 1 – Identify customer HVAC issues and priorities – further discussion

Don Langston thanked Jan for the overview. He then referred back to the first chart and indicated that the groups of common questions was a logical progress through key areas which should be covered with that client. Early on in the discussions, he was usually qualifying the client's degree of commitment. If they were just intending to get three bids and pick the lowest one, he'd disqualify them as a candidate. If he or she was found to not be the decision maker but was in a procurement function and was only following up on a task of procuring bids or possible service providers, Don would work to see if they could meet with that decision maker and move ahead.

Mark Pickett, AMS, agreed with Don's statements. If the client was only interest in bottom line dollars, there wasn't much for them to be talking about. Asking for that cost, contract and approach information up front was a



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good approach for seeing if there might be a good fit. Supplying an equipment list, repair history and utility bills would be a pretty good indicator of interest, whether the conversion was worthy to continue.

Don added that if they went ahead to gather that information, they would be more informed for the face-to-face discussion. What he was really concerned about was the current scope of work and frequency of key tasks. He asked for this information, even a copy of the current contract with the service provider info removed and current costs, if they were willing to provide this, in order to provide a contrast to the approach he would describe. To Standard 180, the only national and ASNI recognized approach to commercial maintenance.

Dale Rossi, FDSI, asked whether these questions was all framed around whether the maintenance would be Standard 180 or nothing? Was that the right thing to do for a user guide? How did that dialogue fit with development of this document?

Don described the way Aire Rite AC, his firm, went to business. The more information they could obtain from a potential client, the better they could assess a possible fit with the services his firm offered and with a Standard 180 based program. That dialogue in a user guide could initially be used for the CA utility programs. But, it would also be used by the Standard 180 Committee in their effort to develop a full user manual. Regardless of whether this results in a Standard 180 base program or not, it's valuable dialogue. The intention with development of this user guide would be the determination of whether this client is a candidate for a Standard 180 based maintenance program.

Mark Pickett, AMS, added that his hope was that they were trying to help and educate a customer down the path of what a Standard 180 program would be based on. Part of a holistic approach to clients.

Bob Sundberg, WHPA staff, commented that he'd heard Dale ask this question before. While the contractors intention was to gauge whether this party was a good candidate for Standard 180, the standard was self-described as a minimum standard of maintenance. It was located on a continuum or range of approaches from total neglect, simple filter service, minimal inspections to a Standard 180 approach and then beyond that minimum to more comprehensive maintenance and system upgrade/improvement services, monitoring, possibly building automation. As Mark described their intent to provide a more holistic, comprehensive program. The standard was never intended, as stated in its FORWARD, to limit what a contractor could offer. So, the user guide could potentially be a great tool for helping both parties accurately assess where on that maintenance continuum the client currently stood and where they wanted to be, based on the objectives the dialogue uncovered. Gathering that information and data could help reveal what that client's real objectives were, which might stop well short of even the Standard 180 minimum.

Don responded that even if the client decided that Standard 180 was more than they needed or wanted, he could respond that the standard indicated that it was the minimum which could attempt to provide thermal comfort, energy efficiency and indoor air quality. He thought that the standard added a lot of legitimacy to discuss of an approach. If the customer did not have a spec, contractors would typically provide their own scope of work, proposal and a price. That comparison was frequently an "apples to oranges" comparison in features, not just a difference in price on the same level of service. This dialogue would help to flesh out those program differences and put the Standard 180 approach on more of a level playing field.

Dan Stradford, NADCA, thought the work product was well done, a fine job of condensing down the process, making it simple and visual.



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Don Langston thanked Dan for his comments and participation. He added that, although all customers were interested in the price, discovering what other drivers motivated them was challenging. Was in static pressure issues? Drafty areas? Utility bills? Equipment reliability? They were all different. The earlier interviews can come up with those drivers, the better. A contractor was really the “tip of the spear” in getting key drivers of the owner talked about. That’s how things got done.

SLIDE 2 – Identify how HVAC budget is structured, alignment with expectations, level of financial commitment – further discussion

Jan Peterson, XCSpec, commented that in discussing this interview process, the group was reminded that most commercial maintenance seemed heavily based on bid prices with few details and rarely a plan. It was generally very commoditized, often just a filter service. Very few owners were able to determine their total return from their maintenance investment that resulted from their current approach. So, the conversation needed to dig down into what their annual budget included. How that organization handled HVAC related service and repairs as well as whole unit replacement. How they broke it down and who was responsible for each part.

Don Langston related a recent customer experience, a potential client with a 10K square foot building and about 65 tons of cooling. The hadn’t even gotten to utility bills when the customer indicated that he just didn’t trust the current service provider. The contractor didn’t provide any work documentation or communicate. He didn’t know what they did while there and things tended to break after they left. And, this building was only a few years old with relatively new equipment. He needed better communication, both verbal and written.

Jan Peterson related a similar but opposite customer discussion. One contractor rarely spoke or left reporting for one of their clients. He didn’t want to “bother” them since they maintained the systems well and rarely had anything go wrong. Jan thought that would be the ideal time for the contractor to report what they did and the value of little to nothing serious going wrong.

Dale Rossi, FDSI - Over several years, his firm had been involved with a large number of rooftop upgrades like those to demand control ventilation economizers. They’d found that the results, as found from meter data, appeared to be highly variable. Small things like even one sensor or changeover point set incorrectly could undo the savings of all the other units. He’d seen great successes and spectacular failures. He thought that evaluation and reporting in the short term were really important while there was still time to fix problems. The 15 minute interval data would be available to anyone, contractor or consultant firm, if the building owner simply signed a utility release form.

SLIDE 3 – Maintenance program metrics, how to judge success – further discussion

The group discussed whether they thought fault detection and diagnostic services (FDD) was a component of a maintenance program or not.

Jan Peterson participated on the FDD Committee and they struggled with what sort of metric for ROI could be calculated for fault correction.

Dale Rossi thought many people held an unrealistic or “fantasy” understanding of FDD. That fault detection would go so far as to determine, tell a tech what part needed to be changed. The big benefit of FDD monitoring service was, in his opinion, you could avoid most “truck roll” calls for service to begin with. There might be a comfort complaint call. Often times the space is at the designated target temperature. The service provider



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couldn't correct that. It wasn't a fault, in this case, just a building decision or policy. If it turned out to be a scheduling problem, it could often be fixed without sending out a service truck on an emergency basis. Dale said that their firm had saved about one-third of service truck roles by taking those sorts of actions when remote monitoring for FDD conditions was used. But, if there was a "no heat" condition, even the best techs couldn't know what part was needed to fix it. The order of magnitude for what needed to be checked mechanically and in the sequence of operations was just too complex.

Don Langston brought the conversation back to the point about metrics being important. The FDD component and system monitoring were all related to establishing "condition indicators" after performance objectives were set. The group would continue to explore how these various elements interacted as they moved ahead.

Closing Comments/Adjournment

Don Langston suggested the next full committee meeting be held Tuesday December 13 and asked Bob Sundberg to send out a meeting notice. He also asked Bob Sundberg to send out the most recent committee work product which Jan had drafted and to **feed their comments and suggestions back to Bob No Later Than December 5.** He would relay them onto Jan. She would incorporate ones she received in time to allow a committee vote on them and finalization in order for it to be considered by the Executive Committee at their December 14 meeting.

ACTION: Don Langston request all committee members review the committee's draft work product which Bob Sundberg would send out. He asked that they reply with their comments and suggestions which Bob would relay onto Jan Peterson for incorporation. This would allow for the work product to be finalized, voted on and delivered to the Executive Committee for consideration at their December 14 meeting.

Next meeting tentative agenda items:

- ADMIN
 - New business
 - Industry/IOU/Regulator News
 - Check on SCE report of program customer energy usage and analysis and
- IOU program monthly updates
- CQM User Guide Working Group work product status
- 2017 Goals and working group planning
- Confirm next meeting date/time, ACTION items, agenda, adjourn

The meeting was formally adjourned at 11:06 am PST.

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Summary of NEW Action Items and Key Decisions

November 2016 ACTION: Don Langston request all committee members review the committee's draft work product which Bob Sundberg would send out. He asked that they reply with their comments and suggestions which Bob would relay onto Jan Peterson for incorporation. This would allow for the work product to be finalized, voted on and delivered to the Executive Committee for consideration at their December 14 meeting.

PAST ACTION ITEMS:

September 2015 ACTION: Scott Higa, SCE, would report progress on the testimonials and access to and analysis of customer energy data at the next monthly meeting. Ongoing.



Goal 2: Commercial Quality Maintenance Committee Tuesday November 8, 2016 Meeting Notes