



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday December 23, 2016

Call to Order

The meeting was called to order at 1:02 pm PST by Rob Falke, Chair and President of National Comfort Institute. Meetings are normally scheduled for 60 minutes.

Roll Call

Quorum for voting organizations = 5 of 9. Meeting attendees included: 4 voting members; 3 non-voting members; 0 guest; 1 staff. A total of 8 members and guests attended this meeting.

P = present at meeting

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

WHPA Goal 2: CQI Committee VOTING Members				Roll Call
Air-Tro	Bob	Helbing	Contractor (Nonresidential)	
Aire Rite AC & Refrigeration	Don	Langston	Contractor (Nonresidential)	
All Pro Plbg., Htg. & AC	Michael	Greany	Contractor (Nonresidential)	
BuildingMetrics	Pete	Jacobs	Energy Efficiency Program Consultant	P
Green Link Mechanical	Jerry	Hernandez	Contractor (Nonresidential)	P
Lincus-Solaris	Brian	Mauleon	Energy Efficiency Program Consultant	
National Comfort Institute (NCI)	Rob	Falke	Educator, Trainer	P
Southern California Edison (SCE)	Sean	Gouw	California IOU	
Tre' Laine Associates	Pepper	Hunziker	Other Stakeholder	P
WHPA Goal 2: CQI Committee NON-VOTING Members				Roll Call
Aire Rite AC & Refrigeration	Larry	Smith	Contractor (Nonresidential)	P
AMS	Marc	Pickett	Contractor (Nonresidential)	P
National Comfort Institute (NCI)	Ben	Lipscomb	Educator, Trainer	P
Lupson & Associates LLC	Warren	Lupson	Other Stakeholder	
San Diego Gas & Electric (SDG&E)	Jeremy	Reefe	California IOU	
Southern California Edison (SCE)	Scott	Higa	California IOU	
WHPA Goal 2: CQI Committee Approved Guests and Staff				Roll Call
IC Refrigeration	Rich	Imfeld		
ServTEC AC	George	Rodriguez	Contractor (Nonresidential)	
Southern California Gas Company (SoCalGas)	Pete	Tanios +	California IOU	
STAFF				
BNB Consulting/WHPA Staff, host, admin. support & scribe	Bob	Sundberg	WHPA Staff	P
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	Rob Falke and Bob Sundberg	Record meeting attendees, finalize past meeting minutes, review status of meeting action items.
Welcome members & guests	Rob Falke	Welcome new guests and prospective members.
New Business	Rob Falke	Committee informed on new business topics to be shared or considered.
WHPA In-Person Leadership Meetings Nov. 17 & 18	Rob Falke	Update on meeting agendas and discussion.
EC response to CQI Committee “definitions” work product	Rob Falke	Information sharing. Work product was “adopted” as a WHPA document.
EC response to CQI WG SFDS work product	Pete Jacobs	Information sharing. Work product was “adopted” as a WHPA document.
CQI Committee proposed 2017 Goals	Pete Jacobs	Agreement on proposed 2017 goals. Next step, develop an implementation plan, timing and progress milestones.
Industry activity – ASHRAE SPC 221 coordination	Rob Falke	Update members on recent industry activity.
Coordination of CQI C. and WG meeting frequency & resource	Rob Falke & Pete Jacobs	Decide on sufficient committee meeting frequency to allow WG 2017 progress.
Summarize meeting, assignments/ACTION items, set next meeting date/time, adjourn	Rob Falke and Bob Sundberg	Set next meeting date, confirm time, review any new ACTION items and next meeting agenda items.

Approve Minutes of Previous Meeting

The November 4 meeting notes were distributed November 11. The minutes were finalized, approved and would be posted to this committee's location at the WHPA website.

Review Status of Action Items from Previous Meeting

April 2015 ACTION: Sean Gouw would speak with Andres Fergadiotti about attending the next CQI Committee meeting to help the team better understand current SCE claimed savings efforts and approaches which might be considered for a CQI program. Ongoing.

August 2016 ACTION: Rob Falke would develop a short document which could be presented to the Executive Committee and request approval/adoption to complete their Goal #2 work product. Bob Sundberg would create the work product cover sheet which would summarize the goal, results of the committee vote and a space for the Executive Committee decision and any vote results. Completed.

November 4, 2016 ACTION: Brian Mauleon, Lincus Solaris, volunteered to look into the building age data point 2.9 and provide a suggested rewording. Completed.



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Welcome New Members and Guests

None.

New Business - Rob Falke

None.

EC Response to CQI Committee “Definition” work product - Rob Falke

Rob Falke congratulated all committee members and confirmed that the Executive Committee had approved and adopted their work product which provided a definition for an efficient commercial HVAC installation. He thought this was a pivotal document, especially for the WHPA. They’d recommended a definition for an efficient installation which would be based on field measured whole system delivered performance compared to manufacturer rated equipment performance. Traditionally, contractors sold system installations and consumers bought based on equipment laboratory ratings rather than what portion of that potential capacity was being delivered to the conditioned space. The shift from equipment rated to delivered capacity would be a big change in the industry and put far greater emphasis on equipment selection combined with system design, proper installation and performance verification.

Rob stressed that the committee had decided that it was not their decision to determine what score or percentage of equipment rated capacity would constitute an “efficient installation.” This first step was to establish the framework for how to score the efficiency of the HVAC system. What actual score or efficiency rating would probably be a decision left to regulators, utility program designers or a goal set by installers or end users. There wasn’t very much data for regulator or utility decision-makers to consider for a threshold level or score yet since installation performance measurement was such a new practice and not yet standardized. Most of the work going forward to develop that measurement protocol and methods for calculating performance would be led by Pete Jacob’s data specification working group and parallel efforts by the new ASHRAE SPC 221 Committee.

EC Response to CQI WG Standardized Field Data Specification – Peter Jacobs

Pete Jacobs – the data specification had been sent out for a working group (WG) vote and approved. There were a few editorial comments submitted during that process which were incorporated in the spec. as minor revisions. The finalized specification was delivered to the WHPA Executive Committee (EC) for consideration and a vote for approval at their December 14 meeting. The spec. was approved by the EC and adopted as a WHPA document. The next step would be delivering it to the ASHRAE SPC 221 Committee which was looking forward to reviewing it at their January winter session meeting. Going forward, the WG would take the commercial installation spec. and modify it for commercial maintenance and residential installation applications and forward it to those respective WHPA committees.

Next steps would include work on methods for calculating system performance from the measurements and data collected in the field. Some of that work had already been started during the formation of the SPC 221 Committee. He had scheduled a WG meeting for the following week to step through what those pro forma measurements might look like. In parallel, he expected that the CQM Committee would be forming its own working group to develop a commercial maintenance version of the specification. He’d volunteered to lead the CQM data spec. working group for which there had already been a number of CQM Committee members participating on the CQI working group. He understood that the CQM Committee had a couple of 2016 work products still in the process of being delivered to the EC. So, their data spec. working group might not be formed right after the first of the new year but he expected it to be formed during the first quarter.

Bob Sundberg, WHPA staff, clarified that the two CQM Committee work products had both been finalized and delivered to the EC for consideration at the December meeting. There wasn’t enough time at that meeting to consider all submitted work products so consideration for theirs was postponed to the EC January meeting. He added that each



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committee chair would also need to request and gain approval for 2017 working groups. Some of those requests would probably be considered at the January or February EC meetings.

Industry Activity related to Commercial Installation, ASHRAE SPC 221 - Rob Falke

Rob Falke, NCI – the new ASHRAE SPC 221 Committee had requested a presentation of this commercial installation data specification for their January meeting in order to understand how Pete’s working group intended the spec. to be used to “benchmark” system performance as their work moved forward. They also intended to have that benchmarked performance documented on a unit label, a recommendation made by an earlier CQM Standard 180 Maintenance Task Working Group. That way, during normal maintenance, technicians could take seven or eight minutes to repeat taking some baseline measurements to track key performance indicators of system performance and note any significant changes. Ben Lipscomb, Mel Johnson along with Rob would be making that presentation to the SPC 221 Committee in January. Rob thanked Pete and members of the working group for all their good work to date.

Rob added that a first draft for the ASHRAE standard that supported this performance evaluation method test method would be released the end of the first week in January. That draft would be reviewed at the SPC 221 meeting on January 31. There had been a number of formation meetings but this would be the first face-to-face committee meeting.

The SPC 221 Committee was organized around twelve different task groups. Those groups would take and edit the standard from their various perspectives. Those included:

- ASHRAE language
- Code compliance
- Field technician’s perspective
- Performance calculations and formulas
- Definitions and symbols
- US and European imperial units adaptations for calculations
- Risk and uncertainty for the test method, an ASHRAE requirement

Rob expected that the draft work would be completed by June and then go out for public review. Ben Lipscomb clarified that the draft would have to be approved by the SPC 221 Committee prior to it being released for public review. He wasn’t certain what other ASHRAE approvals might be necessary before it would be released.

CQI Committee 2017 Proposed Goals - Rob Falke

Rob Falke, Chair - WHPA staff had requested the he provide proposed 2017 goals for consideration by the Executive Committee. The goals would need to be agreed to by committee voting members and would remain “proposed goals” until accepted and approved by this committee. Rob introduced a draft for 2017 committee goals which he wanted the committee to walk through together and consider. He began by reading through a proposed committee mission statement.

The mission of the Committee is to support improving the effectiveness and expansion of IOU/municipal commercial performance-based installation (CI) programs with a goal of developing a commercial-performance based installation concept that can be accepted and implemented by the HVAC industry.

Goal One

Propose that the Commercial Quality Installation Committee be terminated and be replaced with a Commercial Performance-Based Installation Committee. The term “quality” refers to an specific industry standard, while the objectives of this committee are to be more inclusive of a variety of standards and protocols. *Q1 2017, see Mission 1*



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Rob's comments:

This was a carryover goal from 2016 which had not yet been accomplished. WHPA records still listed this committee as the Commercial Quality Installation. This committee had concluded that the term "Quality" in the committee name tied the committee to an ACCA standard which was thought of to be primarily residential and didn't not address system delivered performance. Staff had recommended that the current committee and title be terminated and that a new committee be formed with a name like "Commercial Performance-Based Installation."

Discussion:

Jerry Hernandez, Green Link Mechanical – the term "performance-based installation" was a step in the right direction. But, he wanted the committee to also consider that system design was also frequently overlooked or minimized in the purchase and installation process. Very poor installations were the result of not being designed properly. And, it was very common to have equipment selected which was not appropriate to the application. Years ago this was less of a problem. But today, systems were far more complex and proper system design and equipment selection were critical. If the system was designed incorrectly, it didn't matter how well it was installed, you'd still have the wrong application and you'd never get the system efficiency that was needed. He'd seen this over and over. For example, he believed that VAV systems required modulating control. DX cooling was a misapplication, in his opinion because it contributed to premature compressor failure.

Pepper Hunziker, Tre' Laine Associates – performance was a key driver for this committee and she thought it fit well in the committee name.

Marc Pickett, AMS – he thought they were all trying to do a paradigm shift in the way they conducted business. That shift was toward installation being performance based. Whether it was design, application or the way equipment and systems were installed, he thought all of those would be addressed when performance evaluation was the focus. He thought the committee name seemed long at this point. But, if they were trying to re-define an industry, they needed a name which would capture the central concept that could be applied to installation, maintenance or retrofit applications. He was in favor of the committee name change.

Rob Falke asked whether there was anyone opposed to the new proposed committee name.

Goal Two

As AB 802 opened the door to delivered HVAC system savings that could be verified at the meter through commercial installation programs. However, to operationalize this opportunity would require much more than the Assembly Bill provided for including **the need for a pre and post individual system baseline from which initial incentives could be estimated at the completion of the upgrades.** *The Commercial Installation Committee will develop and deliver a work product associated with the Field Data Specification detailing the tasks and test process required to field measure the operating performance of an HVAC system to establish a single system baseline. Q3 2017, see Mission 3 and 4*

Rob Falke proposed that there needed to be a baseline other than code assumed performance levels on which energy savings could be based. If the AB802 based meter reading could detect poor HVAC performance, the reality was that somebody needed to go out to each building to test individual systems, diagnose problems and issues and implement solutions. The meter couldn't provide any detail about what was wrong with any individual system. The data spec. which Pete's WG had been focused on was the foundation for establishing a new type of individual system baseline based on pre and post assessments. The data spec. contributed to operationalizing AB802.

Jerry Hernandez, Green Link Mechanical – his firm was installing HVAC equipment submeters at several sites which would allow them to extrapolate the HVAC portion of the whole building meter energy electrical use and establish a



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baseline for HVAC usage. This was time-consuming and an additional expense but he thought it was very useful information to gather. BACnet DDC system boards controlling unit BACnet boards was another growing issue along with things like humidity control.

Rob Falke – those were exactly the sorts of issues which could not be addressed directly from whole building meter records. And, that was why the individual system evaluation and scoring methodology was so critical. It could help determine which individual systems were the greatest contributors to HVAC energy waste. AB802 was a great step in the right direction vs. all of the current assumptions and modeling. But, to get energy savings, someone had to get down to the individual system level to establish some sort of performance baseline which would allow future comparison and identify serious deviations which indicated serious issues like Jerry had just described. This was the next step following whole building meter reading and evaluation which would allow contractors to correct poor system performance and capture HVAC energy savings. That was the pathway this committee was on.

Pete Jacobs, BMI – AB802 meter readings called out establishing a past baseline for whole building energy usage. The system performance scoring which the committee and working group was focused on was a diagnostic approach to identify system issues and would help point to what needed to be addressed in order to actually get HVAC energy savings. The normalized meter reading approach would be used to verify improved energy usage and savings once the system issues had been addressed. There would be some tension around new CPUC regulations which established new “pay for performance” requirements where you had to wait for savings confirmation before incentives could be paid out. The performance scoring which the working group and the SPC 221 Committee were looking at were instantaneous (snapshot) system performance evaluations. Those assessments could be used to project annual energy usage and probable savings from field test-in, test-out evaluations.

Rob Falke mentioned Adam Scheer of PG&E who was responsible for designing and operationalizing a “pay for performance” utility program and was watching the committee’s progress very closely to see if it succeeded in developing a tool, an approach to help make AB802 work. He thought progress meeting this goal would benefit a number of utility program efforts.

Rob Falke suggested they complete a review of the remaining goals which were carryover ones from 2016.

Goal Three - Field Data Spec Working Group – Expand Field Data Specification

Support the on-going work of the Field Data Specification Working Group to complete and approve a specification to measure and score the performance of installed commercial maintenance and residential installation HVAC systems. *Working with the Commercial Quality Maintenance and Residential Quality Installation committees produce a related Field Data Specification for Commercial Maintenance and Residential Installation. Q1 2017, see Mission 2 and 4*

Rob’s comments:

This goal would extend the initial commercial installation effort to two additional WHPA committees to be adapted to their applications. Both were expecting a version early in 2017.

Goal Four - Field Data Spec Working Group – Develop Calculation Methods

Following the completion of Goal Three, adhering to the parameters set in the completed Standardized Field Data Specification; continue the working group task of **developing a standardized, repeatable performance-based method for system evaluation**. The specific goal would be to develop formulae and calculations required to quantify a system’s efficiency sufficiently to allow accurate projection of annual energy usage. *Develop a performance-based approach for energy savings claims and verification. Q2 2017, see Mission 3 and 4*



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Rob's comments:

This goal was related to the WG effort to determine those calculations needed to develop a standardized protocol, the method for determining that instantaneous evaluation of system performance vs. the equipment rated performance.

Goal Five – Field Data Spec Working Group – Develop Testing Protocols

Following the completion of Goal Four, adhering to the parameters set in the completed Standardized Field Data Specification, continue the working group work by **developing simplified test protocol supporting procedures forming a HVAC system performance assessment process** that could be effectively utilized by HVAC and EM&V professionals in the field to measure and score the performance of installed HVAC systems. *Establish specific system performance test and assessment procedures. Q3 and Q4 2017, see Mission 2 and 4*

Goal Six

As performance-based data becomes available from performance-based field assessment and measurement efforts across the state, gather and publish summary data consistent with the Standardized Field Data Specification **documenting the typical field performance of HVAC systems**. *This data will be used to further define the performance-driven definition for commercial efficient HVAC installations to provide input to establish minimum levels of acceptable system performance. Q4 2017, see Mission 3 and 4*

Rob's comments:

This goal addressed efforts to gather data and to get a profile for performance levels of typical existing California commercial systems. It would contribute to a field measured system performance database from which to establish a more accurate picture of baseline commercial and residential system performance. The committee would take the collected data and produce a paper to document those typical levels of performance. The resulting paper could be provided to regulators in their effort to establish what would be an acceptable score or level of performance for code compliance as well as for utility programs. The information would be collected from IOUs or other contractors who used this test method around the state.

Goal Seven

Support utility development of **CQI program claimed savings work papers** based upon the newly established system performance evaluation protocol and newly developed commercial marketplace performance baseline. *Ongoing, see Mission 1, 2, 3 and 4*

CQI Committee meeting planning – Rob Falke

This committee would be directly responsible for accomplishing mainly goals 2 and 6. He wanted to get input about the number of meetings and type of frequency members thought it would take to accomplish those goals as well as to support the WG efforts. He proposed 12 meetings of one hour each in order to accomplish their work.

He and Pete Jacobs had agreed that for the data spec. WG to accomplish its goals, this would take 18 meetings with each meeting schedule for 1.5 hours.

CQI Committee vote on 2017 Goals - Rob Falke

Rob Falke – there needed to be agreement of committee members before they could move ahead on the proposed goals. He asked whether they could conduct a voice vote at the meeting or whether it would be advisable to conduct an email vote to allow voting members time to digest the proposed goals and ask any questions they had. Rob offered to relay any questions he received back out to all committee members.

Pete Jacobs, BMI – pointed out that they didn't have a quorum of voting members in attendance. They would probably need to conduct an email vote on the 2017 committee goals.



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Jerry Hernandez asked whether they needed to incorporate training goals along with the development of this performance evaluation protocol and scoring method. What they were undertaking was a complex mixture of air side, refrigeration side and controls measurements and data recording. The workforce being asked to undertake this effort was fragmented and normally were specialized only in one area. No matter how good the goal sounded, he was concerned about firms having the staff to implement it properly or at all. He asked how that concern could be approached and whether they needed to include goals to accomplish those ends.

Pepper Hunziker – when it was appropriate and applicable, she thought they could then dig in to help support development and implementation of training curriculum. She looked forward to doing that but thought that getting the tools developed first was a major step in the right direction.

Pete Jacobs – he thought that goal 5, in particular, lent itself to training and curriculum development.

Bob Sundberg, WHPA staff, suggested that this committee might form a working group in the future to help develop a “user guide” once its goals were accomplished and ASHRAE SPC 221 developed a national standard for commercial installation evaluation. It would parallel the efforts of how the CQM Committee had established working groups to support operationalizing ASHRAE/ACCA/ANSI Standard 180 for commercial maintenance.

Rob Falke – the SPC 221 Committee had unusual direction to write a standard from three parallel but distinct languages.

- The first was to write the standard in ASHRAE/standards language.
- The second was to write it in code/compliance language.
- The final perspective, and the one that was slowing them down, was to write a standard in “street language,” so that it could be immediately used in the field.

They referred to that perspective as a “bolt on standard.” It could be bolted on or easily added to Standard 180 or the commissioning standards, air balancing or other standards. .

Closing Comments/Adjournment

Rob Falke and Bob Sundberg would work on a format for a committee email vote on 2017 goals. Committee voting members should expect an email vote during the first two weeks of 2016.

The next meeting was scheduled for Friday January 20, at 10:00 am PST.

The meeting was adjourned at 11:08 pm PST.

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Summary of Pending and New Action Items and Key Decisions