



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday June 10, 2016

Call to Order

The meeting was called to order at 1:03 pm PT by Rob Falke, Chair and President of National Comfort Institute. Meetings are normally scheduled for 60 minutes.

Roll Call

Quorum for voting organizations = 4 of 7. 5 of 7 voting members, 3 non-voting members and 3 guest/staff attended this meeting. A total of 11 members and guests were in attendance.

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)	P
BuildingMetrics	Pete	Jacobs	Energy Efficiency Program Consultant	P
National Comfort Institute (NCI)	Rob	Falke	Educator, Trainer	P
Southern California Edison (SCE)	Sean	Gouw	California IOU	P
San Diego Gas & Electric (SDG&E)	Jeremy	Reefe	California IOU	A
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)	A
American, Inc. **	Darwin	Ward+		A
Lee's AC, Htg. and Bldg. Performance**	Bryan	Lee+	Third Party Quality Assurance Providers	A
JP Gorman, Inc **	Joe	Gorman Jr.+	Controls (Manufacturer or Distributor)	A
National Comfort Institute (NCI)	Ben	Lipscomb	Educator, Trainer	P
Lupson & Associates LLC	Warren	Lupson	Other Stakeholder	P
Southern California Edison (SCE)	Scott	Higa	California IOU	P
Southern California Gas Company (SoCalGas)	Pete	Tanios +	California IOU	
WHPA Goal 2: CQI Committee Approved Guests and Staff				Roll Call
Aire Rite AC & Refrigeration	Don	Langston	Contractor (Nonresidential)	P
All Pro Plbg., Htg. And AC **	Mike	Greany +		P
Green Link Mechanical	Jerry	Hernandez		
IC Refrigeration	Rich	Imfeld		
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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Friday June 10, 2016**

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.
Review proposed 2016 goals and implementation plan	Rob Falke	Better understanding of proposed mission and goals. Solicit responses and suggestions for revision and/or additional goals to consider.
Solicit and discuss any new proposed goals	Rob Falke	Seek and understand any additional goals proposed by committee members.
CQI Data Spec. & Performance Evaluation WG	Pete Jacobs	Update committee on status of WG.
SCE Commercial Installation Program Update	Scott Higa or Sean Gouw	Inform members about current status and plans for this program.
Create a definition for commercial HVAC installations	Rob Falke	Discuss how to define a performance-driven definition for commercial efficiency HVAC installation.
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 April 17 meeting minutes were distributed April 21. No revisions or corrections were received. The minutes would be finalized and posted to this committee's location at the WHPA website.

Review Status of Action Items from Previous Meeting

April ACTION: Pete Jacobs would provide Bob Sundberg with a concise description of his proposed goal regarding a standardized means for IOU program data collection and content which could be added to the final minutes and added to the list of proposed goals.

April 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, including the hybrid one discussed at the April 17 meeting.

April ACTION: Rob Falke would take Bob Helbing's description of field verified performance and try to produce a goal for the committee to consider. Completed.

Welcome New Members and Guests

1. Warren Lupson, Lupson & Associates (WHPA member). Recently retired from AHRI as Director of Education. Past WHPA member as representative for AHRI since Alliance formation and served on the



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday June 10, 2016

Executive Committee. HVAC contractor in Washington D.C. area for 27 years. Very active with ACCA, board member in the 1980s.

2. Michael Greany, All Pro Plbg. Htg. And AC of Ontario, CA (not yet registered). Has been an advocate of system performance since he began working with Rob Falke in 1994. He'd recently been bidding work based on delivered levels of system performance not by manufacturer model or laboratory rated units.
3. Jerry Hernandez, Green Link Mechanical (not yet registered), unable to attend. Bio summary provided by Rob Falke. Jerry had worked for the LA Unified School District. The last 4-5 years he'd worked at Green Link Mechanical commissioning very large school system and other institutional/commercial buildings. He was an advocate for measured installation verification.
4. Ben Lipscomb, NCI Engineering Manager. HVAC industry for 12 years working in research through design/build/installation and with PECCI/CLEAResult supporting IOU commercial programs. Currently working at NCI designing and implementing utility programs.

New Business - Rob Falke

None.

CQI Data Spec./Performance Working Group Update – Pete Jacobs, Chair

Pete Jacobs had been working with Ben and Rob lately on performance calculation techniques to test the CI standardized data specification. They were pushing real installation data through the calculations to make sure they were capturing all the expected output. He hoped to complete the testing the following week after which he'd send out the data spec. to WG members for final input and approval and then out to their group of 20 or so reviewers for their input and suggestions. Pass it by their critical eyes to make sure their data spec. wasn't overlooking some important information. Once approved by the WG members and reviewers it would be delivered to the full CQI Committee for its consideration. Then, moved onto the Executive Committee for their review and adoption.

Rob Falke added that this was a cross-cutting committee effort. The WG intended to write a draft version of the data specification for the RQI and CQM committees to have those groups finalize a like specification customized for their specific application. In the goals which they'd address later in this meeting, the CI working group intended to take the data specification even further into a development of a standardized method for performance evaluation.

SCE Commercial Installation Program Update – Scott Higa, SCE

Scott Higa provided some background information about how the program had previously focused on workforce education and training and the skillset needed for performing a quality installation. The SCE Commercial Quality Renovation program was collecting field measured system data which would be used in the commercial installation program efforts, specifically toward development of a justifiable approach for assessing system performance for before/after installation comparison for calculating savings on CQI measures.

The work paper development for calculating savings was being highly scrutinized by their engineering team at the same time that the program development team was moving the program plan through implementation approach evaluation gates. The work paper development process had resulted in a recommendation to extend field data collection to address uncertainties. They planned to visit an additional nine sites and about fifty units for additional data collection to substantiate a correlation between commercial quality renovation activities and measured energy savings and costs. Their goals included:

1. Energy consumption savings
2. Peak demand savings and
3. Gather cost information for implementation of those treatments/measurements

In the first stage of the data collection, they were gathering existing conditions performance data.



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday June 10, 2016

This would also allow for a couple of layers of oversight. The data gathering would allow the program implementer an opportunity for a high level of quality control (QC) on contractor staffs learning and working through this process. They also had contracted with Polaris to review the technical activities of the program and work paper development. All of these activities were efforts to validate the viability of contractor capability to properly collect the required data in the future program with a high level of repeatability and reproducibility.

They planned to complete these activities and their final analysis by the end of 2016. Following those internal reviews, they would seek approval by the CPUC during the first half of 2017.

Bob Sundberg asked Scott what was the basis or foundation for the energy savings work paper approach. He'd described the work paper approach for their CQM program as originally being an aggregation of many maintenance practices/measures. Later, he'd described efforts toward a dis-aggregated measure approach believing that greater savings might be claimed. What was their approach for commercial installation?

Scott Higa replied that he hesitated to use those two terms because they came with a lot of preconceived notions. He characterized their approach as being system performance based. This would include measurement and evaluation of generated BTUs vs. those finally delivered to the space. A system delivered EER rather than just a unit generated EER. Their challenge was to get to a very defensible methodology for the calculations required for that field measured delivered EER rating.

Bob Helbing asked Scott Higa whether he knew when the commercial renovation program which had been suspended earlier that year might be re-introduced. He thought it had been a great program which allowed him to convince many building owners and property managers to replace old and inefficient equipment.

Scott Higa replied that he was responsible for the commercial QI and QM programs and that Anne Marie Blankenship managed that program. He didn't feel he could comment on the status of that program.

Rob Falke complimented Scott on his report and their program development. Rob offered that he intended for this committee's goals and efforts to work hand in hand with SCE's program development.

Review Committee Proposed Mission Statement and Goals

Executive Committee approved SMART Goal Topics

They are known as SMART Goals.

SMART is a methodology to develop goals that are

- Specific,
- Measurable,
- Action-Oriented,
- Realistic, and
- Time-Based.

CQI (Commercial Quality Installation) Committee

- Chair: Rob Falke

- *2016 SMART Goal Topics:*
 1. Create a performance-driven definition for (commercial) efficient HVAC installations
 2. Provide input into appropriate business plans as requested



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday June 10, 2016

- Proposed Number of Meetings: 6
- CQI Standardized Field Data Spec and Performance Evaluation Method Working Group
Chair: Pete Jacobs

2016 SMART Goal Topics:

- a. Establish technician data collection protocol to align with EM&V approach
- b. Proposed Number of Meetings: 23

Create a Definition for Commercial HVAC Installations – Rob Falke

Rob Falke introduced the committee goals as the next subject to be discussed. He pointed out that most of the more detailed goals which he had formulated for their review had come from a key topic which had been proposed and approved by the Executive Committee:

1. Create a performance-driven definition for (commercial) efficient HVAC installations

The concept of “system performance” had seemed remote from the way California energy savings was being considered for years. He led a discussion for what attendees thought would be a good definition for a performance-driven efficient commercial HVAC installation. What terms or words would they use? He asked Warren Lupson what he thought a manufacturer would call an efficient commercial HVAC installation.

Warren Lupson responded he thought they would consider an efficient installation as one which has been installed according to their installation and operating instructions. As everyone knew, there were many other factors in the installation in addition to the manufacturer’s equipment. Even when really responsible contractors like Don Langston’s firm are installation, he thought there were so many factors involved in getting the equipment installed correctly into the right system, that was one of the main reasons he’d agreed to join this committee to help. He was also making the transition from representing manufacturers to the real world of contracting and found it challenging.

Rob welcomed Warren’s participation. He also mentioned that in his industry discussions, he often brought up the HVAC equipment rated efficiency and capacity ratings. Plans and specs for HVAC installation projects routinely carried the engineering record of the manufacturer’s ratings. Those ratings are based on some amazing laboratory measuring procedures. But, you mention “field” measured efficiency or capacity and most folks in the industry have difficulty relating to such a new concept. They are mostly puzzled. But, when you moved those discussions into field measurements, there was often a lot of opposition. That’s due in great part because there is no existing procedure in standards that talks about this area of field measurement. His concern was for the accountability where the delivered system efficiency might be as low as 50% or 60% of the rated efficiency. Who was helping the consumer see what they were really getting in their installation? The “P” in WHPA stood for performance. But, there was very little being done in the industry to determine whether or how much of the equipment maximum efficiency was being delivered. A field rated scoring system was at the heart of that need. And, that was a primary goal that this committee had been approved to pursue developing.

Bob Helbing, Air-Tro, stated that BTUs delivered vs. kW consumed was the key measure.

Don Langston, Aire Rite AC and Refrigeration, agreed that what they needed was a field rated EER.

Rob Falke wondered if they were going down the road considering the state focus on Title 24 requirements and the current regulatory method for assessing savings? Was a field measured EER the wrong road to take?

Don Langston didn’t think so. Current measures, in his opinion, just didn’t work. Field measured performance would allow them to move forward. Currently, everything which depended upon measurements taken in laboratory



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday June 10, 2016

environment for the equipment. He and many others knew that there were many conditions below the roof line which had a large, and largely ignored, impact on what efficiency was finally delivered to the conditioned environment.

Warren Lupson agreed. What was most important was what delivered efficiency was being measured after a system was installed. The manufacturer lab testing was there to prove that the equipment could produce a rated efficiency under strictly controlled, perfect conditions. In the real world, there were a lot of different conditions and factors which continually had an impact on what efficiency that system could or would deliver.

Bob Sundberg, WHPA staff, noted that they touched on the AHRI laboratory rating and then jumped to the space delivered efficiency. Would there be a benefit to noting a units rated maximum capacity, measuring the installed equipment efficiency once installed and then again taking measurements of the delivered efficiency to the space? Three points of reference rather than just two? That way, you could try to determine where any drop off of efficiency took place. What the installed unit was delivering vs. those manufacturer ratings. Again, compare the installed efficiency vs. the space delivered efficiency to see if the supply/return system or the equipment installation was the culprit?

Bob Helbing was of the opinion that you could completely ignore the manufacturer's rating. You could simply measure the kW the equipment was consuming vs. the BTUs the unit delivered to the space. He stated that one didn't care how a race car engine performed at the factory. What mattered was how the entire race car system performed on the race track.

Rob Falke mentioned that they were collecting more installation data than ever before. Rather than just rated efficiency, they were not more capable of determining what efficiency was being delivered inside the envelope for the first time. In the past, energy savings estimations depended upon building modeling. There were getting to a point where that generalized modeling could be replaced by measurements for every installation rather than deemed or averaged savings estimations. This could completely change the perspective of the industry. He thought that the efficiency delivered to the space was a key part of the definition they were trying to develop.

Ben Lipscomb, NCI, agreed with what had just been said. But, he thought that whenever you tried to give someone a number, say an efficiency rating, they needed a frame of reference for comparison. He wanted to push back a bit on the idea that the manufacture's rating didn't matter.

- He thought it would be valuable to compare what was being delivered to the maximum unit efficiency rating. Otherwise, whatever rating you give them will not have an impact. Was an EER rating of 6 good? Well, vs. what, they'd ask. If you provided a normal range or how a system could be expected to operate if selected and installed properly, then the rating you quoted would mean a lot more.
- He thought that Bob Sundberg had alluded to the additional comparison of the equipment rating which could be compared to delivered efficiency to the space. You could measure the equipment performance and then the space delivered performance. That would tell you something important about how well the system was delivering the equipment output performance to the space, or not. You needed to establish a frame of reference.

Don Langston agreed with Bob Helbing's focus on the importance of delivered performance. But, using equipment performance measurements as well as installed and delivered performance would also help manufacturers. The lab performance could serve as a baseline. Then, take installed equipment measurements as well as delivered space performance. Those three measurements would lead to better discussions as Ben had described. Why was a 10.9 rated unit only delivering a 6 EER to the space. Then, you could have productive conversations with your customer about where the issue existed. If they would only address fixing the supply or return ductwork, or whatever the culprit turned out to be. In his service work they could talk about just making their standard efficiency equipment work properly rather than believing that replacement with new higher efficient equipment was the answer on a 40-year-old building.



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday June 10, 2016

The discussion could include how they get the most out of their current system or move to possible replacement if it was not capable of operating efficiently.

Pepper Hunziker, Tre' Laine Associates, asked whether this definition was intended to be prescriptive or descriptive? Was the definition supposed to be about a process or an outcome? If performance was a process, the process could be consistent but the outcomes would vary. If performance measurement was an outcome, the process could vary if the outcome was within a defined range. Was it a process with varied outcomes or was it outcome specific?

(Prescriptive – determined by long standing custom; giving exact rules, directions or instructions – Merriam-Webster)

Bob Helbing didn't think you could have a prescriptive definition for performance. Performance was actual behavior vs. predicted or design behavior. It had to be descriptive, a result of measurement of the watts consumed and BTUs delivered. One of the reasons manufacturers went with laboratory controlled bench testing was that condition consistency was vital. They were going to be checked by regulators and they were concerned that under those fixed and controlled conditions, the regulators better come up with the same numbers which the manufacturer claimed for their equipment. That's why there is no building, ductwork or space information. Once you got to the real world of installed systems, technicians would get very different results from one day to the next because of the varying load conditions. Performance changed while systems were starting up and winding down and from hour to hour. Technicians also used somewhat different methodologies even from the same fixed procedure. They could start taking measurements from different places and in different sequences because of the huge variation in buildings and their experience. The real world didn't allow for the same sort of consistent procedures which manufacturer testing depended on. That's why he thought it was best to keep the definition as simple as possible. Try to come up with processes which accomplish the goal but don't include a required process in the definition. One process would not address every building.

Rob Falke asked Michael Greany to describe the new style of proposal his firm was using and the type of response they'd received from consumers.

Michael Greany, All Pro Plumbing, Heating and AC, said that he'd brought back a challenge to his firm after the NCI Summit meetings. To talk with their customers about delivered performance rather than SEER ratings of equipment. They would offer different proposals based on different levels of system performance. He was having some good success with this new approach.

Rob Falke indicated he'd been taking copious notes of the comments made regarding this definition of an efficient commercial HVAC installation. Many factors to consider. He wanted to pull his notes together and send out a draft to all members for their comments. He'd incorporate any further input and treat the definition as a living document.

Further Review of Proposed 2016 Goals – Rob Falke

Rob Falke wanted to have the proposed goals sent out after the meeting for members to mark up with their comments and suggestions. They wouldn't have another meeting until August so the committee would need to finalize its 2016 goals via emails. The italicized sentence at the end of each goal was a summary goal statement. All were very parallel to what the committee had been asked to do by the Executive Committee in their approved topics noted earlier.

COPY OF PROPOSED 2016 GOALS PROVIDED BY ROB FALKE IN A SEPARATE DOCUMENT

Commercial Installation Committee Mission

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



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday June 10, 2016

1. *Advocates for CPUC/ED and CI program agreement on measurable, quantifiable performance evaluation methods to be used by program participating contractors in system evaluation as well as by CPUC/ED program evaluation consultants.*
2. *Formalizes what is meant by “verified performance installation” and develop a protocol, in collaboration with utility and CPUC/ED, that, if followed, will ensure that commercial installations done in California meet the agreed quality standards.*
3. *Quantifies the benefits of CI practices and the potential and actually achieved energy savings.*
4. *Supports development of utility "claimed savings" work papers which will lead to greater program financial support, stability, increased participation and program expansion and far more rapid marketplace adoption of CQI as the norm.*

2016 Commercial Installation Committee Goals

Goal One

Support the on-going work of the CI working group to complete and approve a Standardized Field Data Specification to measure and score the performance of installed 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. *Create a performance-driven definition for commercial efficient HVAC installations.*

Goal Two

Following the completion of Goal One, adhering to the parameters set in the completed Standardized Field Data Specification; assemble a working group for the **development of a standardized, repeatable performance-based method for system evaluation**. The specific goal would be how to quantify a system efficiency sufficiently to allow accurate projection of annual energy usage. *Develop a performance-based approach for energy savings claims and verification.*

Goal Three

Following the completion of Goal Two, adhering to the parameters set in the completed Standardized Field Data Specification, assemble another working group for the **development of a simplified test method and supporting procedures forming a commissioning process** that could be effectively utilized by HVAC professionals in the field to measure and score the performance of installed HVAC systems. *Establish technician data collection protocol to align with EM&V approach*

Goal Four

As performance-based data becomes available from performance-based field measurement efforts across the state, gather and publish summary data consistent with the Standardized Field Data Specification **documenting the typical performance of typical and Title 24 compliant HVAC systems**. *This data will be used to further define the performance-driven definition for commercial efficient HVAC installations.*

Goal Five

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.

Goal Six

Collaborate with other WHPA committees seeking similar goals to include RQI, CQM, FDD and Energy Savings and DEER.



Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday June 10, 2016

Closing Comments/Adjournment

Rob Falke suggested that members send their ideas in to him about how to best define an efficient commercial HVAC installation as well as input about the proposed 2016 goals which he asked Bob Sundberg to distribute. Rob would send revisions back and forth in an effort to finalize both prior to their August meeting.

The next meeting was tentatively scheduled for Friday August 12 at 1:00 pm PDT.

The meeting was adjourned at 2:01 pm PDT.

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Summary of Pending and New Action Items and Key Decisions