



## Goal 2: Commercial Quality Installation Committee Meeting Minutes Friday August 19, 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 = 5 of 9. Meeting attendees included: 9 voting members; 5 non-voting members; 1 guest; 1 staff. A total of 16 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)	P
Aire Rite AC & Refrigeration	Don	Langston	Contractor (Nonresidential)	P
All Pro Plbg., Htg. & AC	Michael	Greany	Contractor (Nonresidential)	P
BuildingMetrics	Pete	Jacobs	Energy Efficiency Program Consultant	P
Green Link Mechanical	Jerry	Hernandez	Contractor (Nonresidential)	P
Lincus-Solaris	Brian	Mauleon	Energy Efficiency Program Consultant	P
National Comfort Institute (NCI)	Rob	Falke	Educator, Trainer	P
Southern California Edison (SCE)	Sean	Gouw	California IOU	P
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	A
San Diego Gas & Electric (SDG&E)	Jeremy	Reefe	California IOU	P
Southern California Edison (SCE)	Scott	Higa	California IOU	P
WHPA Goal 2: CQI Committee Approved Guests and Staff				Roll Call
IC Refrigeration	Rich	Imfeld		A
ServTEC AC	George	Rodriguez	Contractor (Nonresidential)	P
Southern California Gas Company (SoCalGas)	Pete	Tanios +	California IOU	A
<b>STAFF</b>				
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

### 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.



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New Business	Rob Falke	Committee informed on new business topics to be shared or considered.
Review 2016 approved 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.
CQI Working Group Update – Field Measured Data Spec. & Performance Evaluation WG	Pete Jacobs	Update committee on status of WG.
Definition – energy efficient commercial installation	Rob Falke	Discuss, develop and seek agreement on goal statement definition.
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 June 10 meeting notes were distributed June 16. 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 2016 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. Completed.

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. Removed.

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**

Rob Falke welcomed the new members and guest and asked them to introduce themselves.

1. Marc Pickett, AMS. Senior account manager at AMS, Anderson Air Conditioning. He was involved in service, maintenance and installation with a primary focus on energy efficiency and sustainability for their customers. He'd been involved in the HVAC industry for 30+ years and was very interested in the direction this committee seemed to be going with its focus on performance as well as quality maintenance and installation. He'd recently joined the full CQM Committee and had started serving on their Standard 180 User Guide Working Group.
2. George Rodriguez, ServTEC AC. His firm worked out of Santa Fe Springs and had been in the industry for over 52 years. His firm held C4, C20 and C38 California contractor licenses.
3. Jerry Hernandez, Green Link Mechanical. HVAC commissioning project manager CPMP. Retired HVAC technical supervisor and project manager with LA Unified School District. Their firm now holds certification from ASHRAE in commissioning. He'd become quite involved in the development of codes and standards and served on the ASHRAE/ACCA/ANSI Standard 180 Committee.



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4. Brian Mauleon, Solaris Technical, subsidiary of Lincus Inc., IOU (including SCE), MOU engineering consultant firm and directly involved in SCE CQI design, development and program launch team as well as the SCE emerging technology team.

### New Business - Rob Falke

None.

### Review Committee Approved Goals and Implementation Plan

Rob shared that the committee's goals and implementation plan had been approved at the recent August 17 Executive Committee meeting. He provided a summary of the goals for the benefit of the new committee members and guests. He also requested that Bob Sundberg send out a copy to all members/guests following the meeting. (Completed)

#### GOAL #1

Goal #1 was basically the formation of the committee itself and the formulation of 2016 goals and an implementation plan which was now completed.

#### GOAL #2

Goal #2 was the development of a definition for an energy efficiency commercial HVAC installation. Rob had distributed a proposed definition after one was discussed at the June meeting and he'd received revision suggestions from members.

#### Background

Rob indicated that the outcome of Pete Jacobs's standardized field measurement data specification and performance methodology working group was intended to be a method for field evaluation and scoring for system energy efficiency. That scoring was intended to represent a percentage of the OEM equipment rated efficiency, which was determined under fixed laboratory conditions, compared to the BTUs which were actually delivered by the entire system to the building. The industry had relied on those factory energy efficiency ratings and capacity ratings for decades. It was those factory equipment ratings which were most often offered to customers in proposals. The problem, as he saw it, was that customers made buying decisions based almost entirely on those equipment efficiency and capacity ratings, not on the efficiency actually delivered by the entire system to their building. He believed the industry was now capable of rating the system efficiency once it was installed. His firm had found that many typical systems only delivered about 60% of the equipment rated efficiency, drastically below what customers believed they were getting. Also, California and many other states relied heavily on those manufacturer ratings in the methods they'd developed for evaluating energy efficiency and savings claims by utility programs. Utility program claimed savings was then discounted by regulator assumptions on individual energy efficiency measures. The result was that program installations were only recognized for attaining a small fraction of the energy efficiency actually delivered. That conclusion of greatly reduced savings and program success hindered further program expansion. The current program evaluation approach did not address the real level of improved performance newly installed systems achieved since there was no system performance evaluation conducted.

The Executive Committee had suggested the committee come up with a definition for what an efficient commercial HVAC installation actually was.

#### Proposed definition

**"An Efficient Commercial Installation is defined as an HVAC system having the delivered system capacity and efficiency field measured into the building envelope that meets or exceeds a predetermined percent of equipment rated efficiency."**



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### Email Explanation provided by Rob Falke prior to the meeting

“Efficient Commercial Installation refers both to the process of field-measuring and documenting the performance of an installed HVAC system; and to the objective of achieving improvements in measured performance. In the case of existing systems, improvements are relative to measured baseline performance. In the case of new systems, improvements are relative to typical levels of performance.”

“The process of field-measuring efficiency is an emerging technology, and details of the definition are still being determined. The WHPA Commercial Installation Field Data Collection Specification will, once complete, define the measurement and calculation process necessary to quantify installed efficiency. As this specification is operationalized, efficiency targets may be developed that various types of installations must achieve to be considered an Efficient Commercial Installation.”

Rob explained that the predetermined percent of equipment rated efficiency, the level which would establish whether it should be considered energy efficient or not, had not yet been determined. But, some reasonably high rating, well above the current typical 60% or so rating, was intended to be proposed in the future. That percentage could be proposed by this committee or others. Rob proposed that one objective of the current meeting was to review the proposed definition, gather any additional suggestions or revisions and finalize the definition for submission to the Executive Committee. This would complete Goal #2 for the committee. Rob stressed that this shift wasn't intended to take anything away from industry equipment ratings which were still very valid. It was intended to extend that method of evaluation to what customers actually received in their building as a more representative metric. Rob believed that this additional method of measurement would have a great impact on how consumers made purchasing decisions being based on what they received and how contractors evaluated equipment and system installations and how they proposed projects.

### Committee discussion

Pete Jacobs, BuildingMetrics Inc., suggested replacing the term “building envelope” with “building conditioned space.” That would be more accurate and avoid considering buffered spaces or unconditioned plenums or portions of a building not maintained by the HVAC system. He thought they should stress that they were really only talking about the BTUs delivered to the occupied and conditioned space.

Don Langston, Aire Rite AC and Refrigeration and others agreed that this was a good revision.

George Rodriguez, ServTEC AC, asked whether this new evaluation method took into account the original or later changed building load. Further, the load on a building changed every hour and day of the year.

Rob Falke responded that there was no consideration of building load in this definition. He agreed that the actual load on a building fluctuated with changing conditions. But, load was left out of consideration in the definition because commercial buildings could have multiple systems installed to meet that total load. Rob posed the situation where Manual N load calculations were followed and Manual S system sizing procedures were followed. If the equipment was able to meet comfort conditions when only operating at about 60% of equipment rated efficiency, that would call into question how the industry had adapted those load calculations to the low actual performance of those systems. That would open up a can of worms. The current definition was limited to what a single system actually delivered compared to what the manufacturer stated and tested it to be capable of delivering. Rob added that within the data specification, there were provisions for normalizing load conditions. And, one of the goals for the specification was the intention to keep it simple enough for technicians in the field. It was never intended to be a laboratory procedure.

Bob Helbing, Air Pro, stated that he believed system efficiency did not depend upon fluctuating conditions and building load. Changes in building load, for instance adding more people or changing the use of the space, could



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certainly effect whether the current system could meet comfort requirements. But, once up and running, system efficiency would remain pretty consistent.

Jeremy Reeve, SDG&E, thought it was a great definition and appreciated committee members coming to consensus.

Marc Pickett agreed that it was an excellent definition.

Rob Falke asked whether there were any more suggested revisions or discussion. None were offered. Rob then proposed they take a vote on the definition with the change of substituting “into the conditioned occupied space” in place of “into the building envelope...” A voice vote was taken. 7 of 9 voting members voted aye. No voting members voted nay. Two members abstained.

- Aye votes were cast by Air-Tro, Aire Rite AC & Refrigeration, All Pro, BuildingMetrics, Green Link Mechanical, National Comfort Institute and SCE.
- No nay votes were cast.
- Lincus-Solaris preferred to abstain as this was the first meeting they’d attended. Tres’ Laine Associates also chose to abstain as they were an IOU consultant.

The vote passed. 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.

**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.

Rob Falke commented that since the working group’s efforts were works in progress, he thought this definition should not be considered to be cast in stone. As work proceeded, there should remain open to ways it might be improved over time.

Pepper Hunziker, Tres’ Laine Associates, questioned whether the industry abbreviation “HVAC” should be retained or might it be more meaningful for those not in the industry if it was spelled out as heating, ventilation and air conditioning (HVAC). Also, whether HVAC was even needed in the definition.

George Rodriguez shared that in the C20 licenses, the state had included and excluded use of the term over time. He recommended researching the need for this industry jargon in a definition. He didn’t believe the abbreviation was used in the California mechanical or building codes. He thought they could just spell it out. The only other consideration he could think of was whether the committee intended this definition to apply only to packaged equipment/rooftop systems, built up commercial systems or both. The definition didn’t address which equipment it was intended for.

Bob Helbing, Air-Tro, commented that he thought they should keep the definition simple, practical and understandable for all parties. This was not intended to be a code or other legal document or an attempt to draft legislation. He thought the definition would apply equally well to packaged and built up systems and didn’t need to distinguish the intention of use for only one or the other. It was being developed as a guideline for utilities to help design their incentive programs.

Rob Falke stated that those considerations would be taken into account. They needed to move on to Goal #3 to keep on schedule.



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### **GOAL #3**

**Support a working group focused specifically on developing a Standardized Field Data Specification to measure the performance of Installed Commercial HVAC Systems by December 31, 2016.**

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

Pete Jacobs stated that with the most recent input, he thought they were really close to a finalized specification, one ready for WG and committee review. He intended to send out a draft to the working group (WG) along with a doodle poll to help schedule their next meeting some time the following week. This would be version 7.

Rob Falke outlined the approval process. The WG would come to consensus on a draft and provide it to another group of subject matter experts for vetting and a request for any additions, revisions or removals. The WG would then process the reviewer input and finalize and vote on the specification. Once approved at the WG level, the specification would be presented to this full committee for discussion, revision and a vote of approval. The CQI Chair and staff would then provide an executive summary and the work product to the Executive Committee for their consideration and seek approval/adoption as a WHPA document. The committee goal was to have the work product approved before the end of 2016.

Rob added that the committee intended to have this approved version adapted by the WG for both residential installation and commercial service applications. The adapted documents would be forward to each of the other WHPA committees to be reviewed, discussed, revised and agreed upon by each, respectively. The revised documents would then be returned to Pete's CQI WG for any final revisions. Then, they'd be presented to the CQI Committee for approval and presented to the Executive Committee for their consideration.

### **GOAL #4**

**Following the parameters determined in the Field Data Specification, develop a standardized, repeatable performance based method for system evaluation to allow accurate projection of annual system energy usage.**

Rob Falke thought of Goal #4 as just an extension of the Goal #3 work. This effort would define that way that the field measurement data would be used, and the calculations which would be required, to determine system annual energy usage. The data would be plugged into agreed upon formulas and methodology for before/after system energy use to calculate the difference, the energy savings.

### **GOAL #5**

**Following the parameters determined in the Field Data Specification, develop a standardized, repeatable performance-based method for and supporting procedures forming a commissioning process that could be effectively utilized by HVAC and M&V professionals in the field to measure and score the performance of installed HVAC systems.**

All of the earlier effort would then be directed toward developing a standardized commissioning process. This protocol could then be used by program contractor participants, IOU program implementers and EM&V consultants as well as evaluators utilized by the regulators to evaluate program claimed savings and by others. This would be the "how to" part of the overall goal.

### **GOAL #6**

**Support IOU efforts of CI program claimed savings work papers.**

Rob Falke indicated that this was a goal the committee received from the Executive Committee to support of IOU efforts to develop their program claimed savings work papers. This committee's focus would be to support SCE and



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any other IOUs on their commercial installation claimed savings work papers. Scott Higa, who had been asked to serve on the WHPA Council of Advisors, had requested that one of their key consultant firms, Solaris Technical, help the committee’s efforts on this and the previous goals since his future time would now be less available.

### **GOAL #7**

**Develop summary data documenting the typical performance of compliant and non-compliant Title 24 HVAC systems.**

This goal was intended to follow all of the earlier developments and collect program and other testing data gathered across the state from utility and other public programs according to the new standardized protocol. It would form a foundation for comparison of typical system performance of Title 24 compliant with non-compliant systems. He hoped that this effort would provide a more accurate assessment of how well Title 24 compliant systems actually worked as well as accumulate data on how well typical system performed. Current CPUC program evaluation operating assumptions included that 100% of installed systems fully complied with Title 24 requirements which formed their baseline of typical system performance. Rob said that he and many others didn’t not believe that this 100% compliance rate was accurate given the known low rate of permitted projects. He hoped that data gathered, analyzed and published during the next year would provide a more accurate representation of typical as well as Title 24 compliant performance levels.

Pete Jacobs thought that trying to completely evaluate fully code compliant jobs would be tough. It might be very difficult to find fully compliant jobs. He suggested gathering data for permitted vs. non-permitted jobs or existing systems would be a far more manageable goal. This would be a fairly unambiguous distinction. Permitted jobs might or might not be found to be fully compliant. Permitted jobs were the ones recognized by the state as being code compliant. In some cases, permitted jobs were never closed out. Evaluating many permitted jobs would provide, assumed to be fully code compliant, would yield some very valuable data on just how good and varied were their performance levels. He suggested they clearly identify permitted jobs as those for which a permit was applied for, inspections completed and the permitted was then closed out.

Ben Lipscomb, NCI, agreed that finding a decent number of fully code compliant systems could be very challenging. Permitted jobs were recognized and assumed by the CEC as being fully compliant, whether they really were or not.

Rob Falke appreciated the suggestions made. The goal statements would need to stand for this year. But, since that work was not intended to start until 2017, the goal wording would be revised for the 2017 implementation plan.

### **Closing Comments/Adjournment**

Rob Falke apologized to members for changing the meeting date from August 12 to August 19 with only a few days advance notice. The WG had a number of items to try and finalize prior to August meeting which would not have been in place by August 12. He committed to providing much greater advance notice when at all possible.

The next meeting was initially planned for the 3<sup>rd</sup> Friday in September which most attendees could attend. Later, Rob considered that since there were only two remaining staff supported committee meetings in 2016, they should postpone the next meeting until Friday October 21 at 1:00 pm PT. This would allow the WG to meet and make progress and a final full committee meeting remaining for evaluation and a vote on the WG work product.

The meeting was adjourned at 2:00 pm PDT.

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### **Summary of Pending and New Action Items and Key Decisions**



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