



**Goal 2: Commercial Quality Installation Committee
Monday April 22, 2016 Meeting Draft Notes**

Call to Order

The meeting was called to order at 1:04 pm PDT by Rob Falke, Chair and President of National Comfort Institute (NCI). Meetings are normally scheduled for 60 minutes.

Roll Call

Quorum for voting organizations = 4 of 6. 4 of 7 voting members, 3 non-voting members and 1 guest/staff attended this meeting. A total of 8 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)	
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	
Tre' Laine Associates	Pepper	Hunziker	Other Stakeholder	P
WHPA Goal 2: CQM Committee NON-VOTING Members				Roll Call
Aire Rite AC & Refrigeration	Larry	Smith	Contractor (Nonresidential)	P
American, Inc. **	Darwin	Ward+		
IC Refrigeration	Rich	Imfeld	Contractor (Nonresidential)	
Lee's AC, Htg. and Bldg. Performance**	Bryan	Lee+	Third Party Quality Assurance Providers	
JP Gorman, Inc **	Joe	Gorman Jr.+	Controls (Manufacturer or Distributor)	
Southern California Edison (SCE)	Tara	Becnel	California IOU	
Southern California Edison (SCE)	Scott	Higa	California IOU	P
Southern California Gas Company (SoCalGas)	Pete	Tanios +	California IOU	P
WHPA Goal 2: CQI Committee Invited Guests and Staff				Roll Call
Aire Rite AC & Refrigeration	Don	Langston	Contractor (Nonresidential)	
California Public Utilities Commission (CPUC) - Energy Division	Lola	Odunlami	California PUC	
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, approve past meeting minutes, review ACTION items and agenda	Rob Falke and Bob Sundberg	Record meeting attendees, finalize past meeting minutes, review status of meeting action items.
Welcome members & guests	Rob Falke	New members and invited guests welcomed.
New Business	Rob Falke	Address any new or critical issues.
Report on previous assignments	Hunziker & Sean Gouw	Standards and training organizations research related to HVAC performance evaluation.
CQI Field Measurement Data Spec. Work Group	Pete Jacobs	Update committee on WG status. Plans for re-launching efforts in 2016. Coordination with chairs of CQM and RQI committees for their application specific data spec.
CQI HVAC Unit/System Performance Evaluation Protocol	Pete Jacobs	Expected timing and participants to move from data spec. to performance evaluation WG effort.
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 February 29 meeting notes were distributed March 4, 2016. Bob Sundberg would have finalized meeting notes posted to the committee's website location.

Welcome New Members and Guests, Membership Status

Rob Falke, Chair, commented that several of their original members had found it difficult to attend the monthly meetings. He expressed an interest to have attendees and current members recommend additional candidates who were interested and able to make valuable contributions to the committee efforts. There were several participants in Pete Jacob's Working Group who might be interested to also participate in the full committee.

ACTION: Rob Falke would provide contact information to Bob Sundberg about several individuals who had expressed interest in joining this committee. Bob Sundberg would then contact those individuals to begin the new member process.

Review Status of Action Items from Previous Meeting

July ACTION: Pepper Hunziker and Sean Gouw would investigate and provide a summary of all known standards which effected HVAC installation and performance as well as all known organizations which provided HVAC training and included training on those standards. Rob Falke delivered a standards summary document for Pepper and Sean to continue with their investigation. Pending.



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December ACTION: Pete Jacobs and Rob Falke would talk with each of the other relevant WHPA committee chairs about how best to proceed with future phases of the data specification working group which would focus on residential installation and commercial maintenance. They would also contact ACCA representatives to discuss future committee goals, the committee name issue and learn about ACCA plans for revision of their Standard 5.

Status: Rob Falke met with Don Langston at ASHRAE/AHRI in January. He'd taken notes from their discussion about coordinating CQI/CQM committee efforts on the data specification effort. He had not discussed further with Don or Dale Rossi since then. He intended to provide Don and Dale with his notes and discuss this further with both of them during the next month. Rob had also contacted Chris Ganimian of the RQI Committee and gotten input about what that committee would be interested in regarding a data specification specific to residential installation. Current thinking was that the commercial installation draft would be submitted to both the CQM and RQI committees so that those groups could customize the CQI draft more specifically to meet their application needs.

March 2016 ACTION: Rob Falke would review and compare the committee's 2015 goals against CQI Committee goals developed by the November 5 WHPA In-Person Meeting breakout group. He would produce a suggested version for 2016 which could be submitted to committee voting members for approval by Friday March 4 and then provided to the Executive Committee for consideration at their March 9 meeting.

New Business - Rob Falke

None.

CQI Standardized Field Measurement Data Specification WG (CQM SFMDS WG) - Pete Jacobs

Pete Jacobs, BuildingMetrics Inc. and chair, reported

Standards & Training Organizations Related to CQI - Sean Gouw and Pepper Hunziker

Sean Gouw, SCE, indicated that he'd not been able to investigate the extent of industry standards training beyond utility programs any further.

Pepper Hunziker, Tre' Laine Associates, added that commercial installation was in quite a different position than some others. There was quite a lot of agreement that ACCA Standards 5 and 9 were a basis for "quality" residential installation. Also, that ASHRAE/ACCA/ANSI Standard 180 was the first and only known industry standard which was attributed by many in industry to have defined the minimum for "quality" maintenance practices. But, there didn't seem to be an industry consensus on whether any single standard defined "quality" commercial installation adequately. There appeared to be quite a number of industry groups which had developed standards for a part of the installation process. But, they hadn't located any single umbrella standard over the entire process. She was unaware of any training outside of what was being provided by SCE that was labeled or referred to as quality installation.

Rob Falke, Chair, commented that a lot of the skill required by many of those individual industry standards was beyond the range of most entry level HVAC technical training programs. Those standards required a lot of advanced testing which was probably only conducted by the more skilled and experienced personnel.

Bob Sundberg, WHPA staff, offered that he understood that the terms "quality installation" and "quality maintenance" had originally been used in guiding documents like the California Long Term Energy Efficiency Strategic Plan, the HVAC Action Plan as well as in formation of the WHPA and its committee names and other documents as a sort of shorthand for installation or maintenance based upon national standards as Pepper had indicated earlier. The actual term "quality" by itself was not specific or further defined. As Pepper indicated, residential quality installation implied that an



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installation was based on and met the requirements of ACCA Standard 5 and 9. Quality maintenance was intended to mean the maintenance was based on a plan developed to comply with ANSI/ASHRAE/ACCA Standard 180.

Attendees all agreed that Pepper and Sean had investigated their action as far as it was likely to go. Commercial quality installation seemed to be an undefined term and not tied to or based on any specific known national standard. The action item was considered completed. Pepper indicated that they might explore the issue more in the future and that she and Sean would get back to the group if they uncovered any new information.

Working Group Update – Pete Jacobs, Chair

The Standardized Data Specification and Performance Evaluation Protocol Working Group (Data Spec. WG for short).

Pete Jacobs, BuildingMetrics Inc., reported that he and Rob had spoken with Jeff Henning and Chris Ganimian of the RQI Committee and also with Don Langston of the CQM Committee on how best to proceed regarding adapting the CI data specification to their specific applications. All were very supportive of the work completed so far but wanted to take more ownership of any further refinement by their respective committees. They would hold separate meetings within the current CI WG to transform the CI spec. into one customized to fit the other two applications. Then, send that application specific draft to each of the other two committees for their further refinement and completion of their data specification work product.

Rob Falke, Chair, explained that most of the work of the committee was being tackled in the working group. As a result, the Executive Committee had allocated considerable staff support for those WG meetings. As a consequence, the resource to support committee meetings had been reduced to about six for the year. The WG had been approved for 23 meeting hours of staff support. That resource could be used to hold meetings of whatever duration and frequency the WG thought most productive.

Pete Jacobs thought that the WG would focus first of all on completing the commercial installation spec., obtain input from its group of reviewers, incorporate that input into the specification and finalize that work product with a WG vote and then a full committee vote. He expected to get a first meeting scheduled within two weeks to continue their work.

Rob Falke offered to send out an article he'd read recently regarding system delivered performance rather than the past and still current focus on equipment EER and SEER factory ratings. The approach suggested a new way of doing business with customers in the future. He knew of several contractors who were already scripting their proposals around HVAC system measured and delivered performance and moving away from only referencing equipment rated maximum efficiency.

CQI Committee Goals - Rob Falke

Bob Sundberg, WHPA staff, shared the following summary of 2016 SMART Goal Topics which had been approved by the Executive Committee (EC) at their April meeting for this committee and its working group online with attendees. The committee was expected to take these topics and develop a reasonable number of more specific goals with progress milestones for resubmission to the EC for approval.

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



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- Proposed Number of Meetings: 6
- COI 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

Rob Falke, Chair, next walked attendees through the goals document he'd developed. His goals document summarized 2015 goals and what progress he'd concluded had been made. He also revised several of the 2015 goals for continued work in 2016. The following is a summary paraphrasing of the goals from Rob's document.

- Goals 1. Support the working group's continued effort to develop a standardized data specification which would identify all of the required measurements required to determine system delivered performance. This working group also intended to produce a draft data specification for residential installation and for maintenance/service applications to be turned over to the respective RQI and CQM committees for refinement and completion as additional work products.
- Goals 2. Utilize the commercial data specification to develop a standardized, repeatable field measurement method for evaluating and benchmarking HVAC full system delivered performance. The purpose for these two goals was to have one standardized performance evaluation method which could be used by IOU program managers to develop claimed savings work papers, be used by program implementers and participants to measure progress in meeting program goals and for program evaluators to confirm program delivered savings.
- Goal 3. Develop a simplified in-field test method for measuring and scoring delivered performance for installed HVAC systems.
- Goal 4. Gather and publish field measured HVAC system data documenting typical/average HVAC system performance levels and that of Title 24 compliant systems.
- Goal 5. Support utility staff development of commercial installation program claimed savings work papers.
- Goal 6. Collaborate with other WHPA committees seeking similar goals. This would include the RQI, CQM, FDD and Energy Savings and DEER committees.

Pete Jacobs commented that the HVAC system delivered performance metric might be a form of delivered efficiency or field adjusted EER. It was intended to be a one-time snapshot efficiency metric. The next challenge would be to project this or several snapshot readings into HVAC annual energy consumption for the building. This would allow for a test in/test out comparison of energy use for both the original system and the retrofitted equipment and modified system. This would be a two-step process. First, to determine an instantaneous performance assessment. The second step would be to extrapolate this assessment into a projection of annual energy usage. Pete also suggested the need for some distinction in Goal 4 about installations which had been permitted and were Title 24 compliant and those which weren't. Some percentage of permitted jobs also were probably not really compliant with Title 24 requirements for one reason or another. And, there were probably unpermitted jobs which were compliant. Being permitted was not a guarantee that the installation was actually compliant and the reverse was probably true as well.

Rob Falke was interested to see the performance of fully Title 24 compliant permitted installations. He'd heard a number being circulated that this might account for only around 3% of system installations.

Scott Higa, SCE, had surmised from the Goal 4 explanation that what Rob's goal was looking for was 1) establishing a level of performance which could be expected from permitted and Title 24 compliant installations as well as the 2) type of market baseline performance which could be expected from the much larger number of unpermitted installations which took place which many thought accounted for over 80% of all HVAC installations.



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Rob Falke agreed that they were interested in establishing the performance levels for those two categories to compare with a commercial installation based on system performance optimization and verification. Each system being evaluated would have to be documented as being assigned to one of those three categories to allow later comparison and to build an expanding database representing the true marketplace baseline for each one.

Rob Falke asked whether Pete Jacobs would be willing to re-write the goals 1 and 2 to more accurately reflect the goals of the working group. Pete agreed.

ACTION: Pete Jacobs would provide a revision of goals 1 and 2 to more accurately reflect goals of his working group.

Rob Falke thought that Goal 5 was especially important given efforts to implement the legislative directives in Assembly Bill 802. He asked Sean Gouw or anyone else for any new information regarding AB 802 and its impact of the new approach allowing energy savings to be determined from building meter data.

Bob Sundberg, WHPA staff, mentioned that he'd just received notification of a CPUC Administrative Law Judge (ALJ) posting of the CPUC ED staff White Paper and request for public comments to be provided during May. This was an effort to gather public comments regarding what the CPUC ED staff proposed energy efficiency baselines as a result of the AB 802 directive.

Copy/paste the following URL into your browser to access the ALJ ruling and two additional related pdf documents.
<http://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&docid=159980778>

Pete Jacobs volunteered to review the publication and lead a Q&A session at the next committee meeting. The AB 802 directive and ED baseline white paper were consistent with a system test-in evaluation to determine the previous system performance establish an energy usage baseline for comparison with a newly installed system. It was important to establish what the ED was addressing in AB 802 and what wasn't covered. He didn't think that establishing of a baseline was essential for determining the difference in building HVAC energy usage. One could conduct an energy usage comparison strictly from before/afterward meter billing records and not test the HVAC system at all.

ACTION: Pete Jacobs volunteered to review the new CPUC ED Staff White Paper on Energy Efficiency Baseline produced in response to AB 802. He provided a summary of highlights and lead a Q&A discussion at the next committee meeting.

Rob Falke thanked Pete. He also added that a meter based approach to confirming energy savings but it was critical to establish a system evaluation methodology in order to determine which units and what part of a unit's delivery system were keeping it from being as efficient as it was designed to be. Somebody still needed to figure out what was wrong, where the problems were and how to repair or fix the system to make it more energy efficient. Then, to retest the system to see whether the changes or repairs had delivered the intended improvement in efficiency.

Pete Jacobs agreed that regarding program implantation just taking meter readings didn't make any sense. Doing the testing to determine problems and impact of repairs and adjustments was the way to get those meter confirmed savings. But, meter reading did make sense in light of AB 802 and the intent to create a new pathway for documenting HVAC energy savings rather than the current approach which focused on isolated energy efficiency measure evaluation based heavily on assumptions, projections, lab test results and building modeling.



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Pete Jacobs also mentioned that DNV GL was conducting an HVAC6 study for the CPUC ED that was to focus on permitted and compliant rates mostly for residential installations. A small part of the study would focus on commercial systems.

In the Search Criteria box, at the bottom insert exact text “hvac6” (do NOT include quotation marks) to get the following results.

<http://www.energydataweb.com/cpuc/search.aspx?did=1495>

Search
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Search Criteria

- ▣ Sector
 - All
- ▣ Stage of Work
 - All
- ▣ Study Type
 - All
- ▣ Technology Type
 - All
- ▣ Deliverable Type
 - All
- ▣ Study Lead
 - All
- ▣ Evaluation Firm
 - All
- ▣ Topics (Pre 2011 Documents)
 - All
- ▣ Portfolio Cycle
 - All
- Energy Efficiency EM&V Plans
 - [Click here to view list](#)

Work Order

From: To:

Publication Date

Search Text (exact match)

Evaluation Studies Public Document Search

05/04/2016

Welcome to the Energy Division's Public Document Area. At this location you can find:

- The current master evaluation plan
- specific research plans
- draft reports, and
- provide comments on active documents

These materials are made available to support California's Evaluation, Measurement, and Verification (EM&V) work. You can also subscribe to an RSS feed to get regular updates. Work products developed by CPUC and/or Program Administrators are available on this site.

Result: 5 documents

Document Title	Publish Date	Comment End Date
Draft Research Plan for HVAC Permit and Code Compliance Market Assessment - HVAC6 Summary: California's Long-Term Energy Efficiency Strategic Plan has set the goal that 50 percent of HVAC installations in existing buildings comply with codes via permits by 2015 and 90 percent of HVAC systems are installed to code and optimally maintained for systems' useful life by 2020. This study plans to investigate standard practices for residential and nonresidential HVAC changeouts in California. More specifically, this study will: 1) estimate the percent of projects that obtained required building permits and comply with building energy efficiency standards (Title 24, Part 6); 2) investigate permitting and compliance separately including whether nonpermitted projects are compliant and if permitted projects are compliant; 3) Evaluate efficacy of HERS raters and if inspected jobs meet Title 24 requirements as well as awareness of code requirements to identify gaps. For more information please contact Paula Gruendling at paula.gruendling@cpuc.ca.gov	01/26/2015 <input type="button" value="View"/> <input type="button" value="Download"/>	02/13/2015 <input type="button" value="Comment"/> My Documents: <input type="checkbox"/>
Final Research Plan for HVAC Permit and Code Compliance Market Assessment (HVAC6) Summary: This is the final research plan. Post public comments and public webinar. For more information please contact Paula Gruendling at paula.gruendling@cpuc.ca.gov	02/25/2015 <input type="button" value="View"/> <input type="button" value="Download"/>	06/01/2015 <input type="button" value="Comment"/> My Documents: <input type="checkbox"/>
HVAC Permit and Code Compliance Market Assessment (HVAC6) research plan- Webinar Slides Summary: Slides for research plan public webinar. Updated with webinar recording instructions for access, available until 03/04/2015. For more information please contact Paula Gruendling at paula.gruendling@cpuc.ca.gov	02/04/2015 <input type="button" value="View"/> <input type="button" value="Download"/>	06/01/2015 <input type="button" value="Comment"/> My Documents: <input type="checkbox"/>
HVAC6 - Memo 1: A Proposed Methodology for Measuring Partial Compliance with Residential HVAC Changeout Code Summary: This is the first planned memo for this study. This memo outlines proposed methods for determining partial compliance for residential HVAC changeouts. This memo is final. For more information please contact Paula Gruendling at paula.gruendling@cpuc.ca.gov	07/31/2015 <input type="button" value="View"/> <input type="button" value="Download"/>	07/31/2015 <input type="button" value="Comment"/> My Documents: <input type="checkbox"/>
Results of HVAC6 Phase One Market Assessment of Residential Permitting and Partial-Compliance Summary: This is the memo outlining findings of the phase one bottom-up analysis. The bottom-up analysis calculates compliance with HVAC changeouts based on results of site inspections for both permitted and unpermitted jobs. The phase one assessed compliance based on site analysis of half of the target sample, or 100 sites. Therefore this memo provides preliminary results. This memo also includes the methods used. Other background information can be found in the research plan (search word HVAC6). Stakeholders are welcome to provide comments but the evaluation team is not planning to revise this memo unless needed. Comments will be inform phase 2 work and the final report. Comments are welcome until May 13-CDB. For more information please contact Paula Gruendling at paula.gruendling@cpuc.ca.gov	04/11/2016 <input type="button" value="View"/> <input type="button" value="Download"/>	05/20/2016 <input type="button" value="Comment"/> My Documents: <input type="checkbox"/>



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Pete Jacobs suggested possibly inviting Amber Watkins of DNV GL to a future meeting to better inform the committee regarding this project. She typically attended the WHPA Compliance Committee meetings.

Rob Falke thought that would be an excellent idea.

ACTION: Pete Jacobs would invite Amber Watkins of DNV GL to the next committee meeting to help inform members about the HVAC Permits and Code Compliance study.

Rob next asked Scott Higa about one additional goal which the Executive Committee has added to their list. To support IOU business plan development. He asked Scott if he could explain what was needed a bit. Had Scott discussed this goal with Jeremy Reeve and the other program managers yet?

Scott Higa explained that the business planning process was quite tenuous and changed frequently for the program planners. He wanted to forewarn the committee that their input would probably be requested late in the process without a lot of time for refinement of their feedback.

Bob Sundberg, WHPA staff, reminded attendees that the CA CCEE had already hosted an online workshop specifically for WHPA members held on March 24. The WHPA had emailed all members an announcement of the event earlier in March.

CPUC directed California Energy Efficiency Coordinating Committee home page:
<http://www.caeecc.org/>

The California Energy Efficiency Coordinating Committee (CAEECC) and its subcommittees were authorized by California Public Utilities Commission [Decision15-10-028](#). This new forum is the venue by which stakeholders can provide early input into the development of the Program Administrators' five-year energy efficiency business plans.

CA CCEE and Subcommittee Meetings summary page:
<http://www.caeecc.org/#!/meetings-1/p1j0q>

CA EECC Commercial Subcommittee site:
<http://www.caeecc.org/#!/commercial/jxqdp>

Most of the above links allow access to meeting notes, IOU sector strategy presentations and comments made by various non-agency organizations.

Closing Comments/Adjournment

Rob Falke asked that Bob Sundberg forward the EC approved topics document to all committee members. He asked that members review the topics and Rob's summary of proposed goals and send their comments back to him and copy Bob by April 29.

Rob Falke suggested they could hold the next meeting on a Friday, June 17 after the WG had the opportunity to hold a couple of their meetings. Bob Sundberg would send out a meeting notice for June 10.

Tentative agenda items for the June meeting would include:

- 2016 goals



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- Working Group update – Pete Jacobs
- CPUC ED Staff White Paper – Baseline issues in light of AB 802 – Pete Jacobs to provide his take and lead Q&A session
- Amber Watkins of DNV GL invited to attend and inform members about the HVAC Permits and code Compliance study

The meeting was adjourned at 2:07 pm PDT.

* * * * *

Summary of Pending and New Action Items and Key Decisions

April 2016 ACTION: Pete Jacobs would provide a revision of goals 1 and 2 to more accurately reflect goals of his working group.

April 2016 ACTION: Pete Jacobs would invite Amber Watkins of DNV GL to the next committee meeting to help inform members about the HVAC Permits and Code Compliance study.

April 2016 ACTION: All members were asked to deliver their comments and suggestions regarding committee 2016 goals to Rob Falke with a copy to Bob Sundberg no later than April 29.

April 2016 ACTION: Pete Jacobs volunteered to review the new CPUC ED Staff White Paper on Energy Efficiency Baseline produced in response to AB 802. He provided a summary of highlights and lead a Q&A discussion at the next committee meeting.