



**Goal 2: CQI FDS (Field Data Spec) Working Group**  
**Thursday, May 18, 2017, Meeting Notes**

**Call to Order**

The meeting was called to order at 11:05 a.m. PDT by Chair Pete Jacobs, BuildingMetrics Inc (BMI). Meeting was scheduled for one hour.

**Agenda**

ITEM	AGENDA TOPICS	DISCUSSION LEADER
3 min	Welcome and Roll Call	Galawish
2 min	Agenda Review	PJacobs
10	Provide Context for the commercial maintenance Spec	PJacobs
40	Review/Discussion: modification of commercial installation spec to apply to commercial maintenance programs	PJacobs
5 min.	Closing Comments/Adjournment	PJacobs
	Next Meeting – TBD	Galawish

**Roll Call**

Organization	First Name	Last Name	WHPA Category	P=Present
ACCA (Air Conditioning Contractors of America)	Donald	Prather	Contractor Association	P
BMI (BuildingMetrics Inc.)	Pete	Jacobs	Energy Efficiency Program Consultant	P
Clean Energy Horizons, LLC	Norm	Stone	Energy Efficiency Program Consultant	P
Daikin Applied	Skip	Ernst	HVAC Manufacturer	P
DNV-GL	David	Cranford	Energy Efficiency Program Consultant	P
Energy Solutions	Jim	Hanna	Energy Efficiency Program Consultant	P
NCI (National Comfort Institute)	Ben	Lipscomb	Educator, Trainer	P
Galawish Consulting Associates (Staff Support)	Elsia	Galawish	Energy Efficiency Program Consultant	P

## Welcome

Chair Pete Jacobs (BMI) welcomed members and reviewed the agenda items for the meeting. Similar to the development of the RQI data specs, the focus of this meeting was to take the lessons learned during the development of the CI data specifications that were approved in January 2017 and produce a “pro-forma” version for consideration by the CQM Committee for their consideration.

## Provide Context for the Commercial Maintenance Spec

Pete Jacobs (BMI) recapped the Working Group’s (WG) activities to date.

Overall objective was to develop a standardized field data collection specification for HVAC programs that enables the collection of data necessary to conduct customer savings calculations and facilitate and improve “evaluability” of programs. The WG produced a data specification for commercial installation (CI), which was approved by the WHPA EC in January 2017. Additional goal is to transform the CI-approved specs for residential installation and commercial maintenance for consideration by those committees. A draft residential installation spec was submitted to the RQI Committee in April for its consideration. Similar to what was done for the RQI Committee, this WG will take what it has learned during the development of the CI spec and modify to make relevant to QM producing a “pro-forma” spec for consideration by the CQM Committee. It will be the role of the CQM Committee to convene a Working Group and review the specs. Pete Jacobs (BMI) noted that there is likely to be significant overlap in participating members in the RI and CI Working Groups.

## Review/Discussion: Modification of CI Spec to Apply to Commercial Maintenance Programs

Pete Jacobs (BMI) – Working closely with CQI Committee’s Chair Rob Falke (NCI) and Ben Lipscomb (NCI), we drafted the initial version of the “pro-forma” QM specs for this Working Group’s review. (He led the WG through the changes made to transform the CI specs to QM specs and welcomed feedback.) The intent was to solicit comments and questions on the edits that were made, incorporate those comments, and submit to the CQM Committee if the CQI FDS WG approves. It must be made clear that the WG is simply producing a basic workable QM specifications framework to be handed over to the CQM Committee for consideration.



Data working group  
meeting 5-18-17.pptx

## *Spec Revision Highlights*

In order to prepare the draft QM spec, there were two principal source documents:

1. CQI Data Spec
2. CQM Maintenance Task Working Group Report (January 2015)

There was a significant amount of overlap and congruence between what we are proposing and the data elements in the January 2015 report. Anything called out in that report was also in the QM spec.

This is a data specification and not a protocol document—the group is not prescribing any particular methods. The development of methods and specific activities, especially in the maintenance realm, can be challenging.

Specific maintenance tasks depend on program design and/or maintenance plans if a Standard 180-based program. Data requirements depend on maintenance tasks, and the industry is subservient to whatever protocols and plans are

laid in place for how programs will proceed. The intent is to bolt this on to the different program designs and maintenance plans that are relevant to any particular activity.

When a new contractor comes on the job, an initial baseline assessment must be conducted whether at the unit level or, in some instances, at the system level. With the specs, we are trying to be inclusive and allow these specs to bolt into a number of different program designs.

Specs cover a range of activities including:

- Maintenance baseline measurement activities to support initial assessment
- Measurements for on-going maintenance depending on program
- Scope of services to include unit and whole system depending on the program and the scope of activities
- Depending on the scope of activities, the measurements could include
  - Refrigerant side (look at state-of-refrigerant cycles and any repairs that may be necessary)
  - Air side measurements (look at outside air situations and pressure drop across coils for cleanliness).

The group was asked to keep in mind how we want to present this specification. Currently the data spec is inclusive of all measurements needed to characterize the system's performance out to the system's level, and it is somewhat redundant with some information in the CI spec.

Two questions were posed for the group to consider while reviewing the draft QM spec.

1. From a usability perspective, do we include all the system-level measurements for CQI spec or make reference to CI spec so people will deal with two documents given the scope of their activities?
2. As we step through the data requirements, what is the best way to call out which particular measurements are applicable to the scope of maintenance activities including both benchmarking and on-going activities. How do we best cross-reference data requirements with maintenance activities?



Proposed Coml  
Maintenance FDS v 1.:

### **Proposed OM Data Collection Specs – Discussion**

Pete Jacobs (BMI) – The intent is to talk through some of the high-level issues and then distribute to the group for review and comments on the details. Pete Jacobs (BMI) presented the draft specification, noting that the outline is similar to the earlier developed specs.

#### **General Utility Info:**

Norm Stone (Clean Energy Horizons) – The electric meter #s are included and I wonder whether the account #s for each site will also be collected.

Pete Jacobs (BMI) – The account #s can be a little tricky when on site when trying to find someone to share the info. The idea is to physically look at a meter and grab the number off the meter; that is a positive link back to the billing data and also to the account. In terms of field data collection, the meter # is critical, particularly for California IOUs. Usually the account number is provided by the utility—the contractor usually does not collect that information. We tried to make this uniform across all the specifications (RI, CI, QM), standard forma for system-level and customer-level information. We proposed collecting general contextual data—building type, vintage, any certification info that ties back to the technician performing the work—this is identical to the installation spec.



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### General System Info: (*Information collected when doing an inventory*)

Donald Prather (ACCA) – Equipment data—collecting information this way, you may get package units reporting both an indoor and outdoor. Depending on how you are collecting the data may cause some confusion.

Pete Jacobs (BMI) – Given that, we should identify whether it is a split or a package unit and only have indoor data applied to split systems.

### Economizer Data:

Skip Ernst (Daikin Applied) – For economizer data, you are also going to get mixed results on packaged units. Every economizer is different.

Pete Jacobs (BMI) – Acknowledged that point and suggested we call out whether an economizer is an accessory economizer vs. one from the factory or a third-party accessory.

Donald Prather (ACCA) – The question is how is the economizer going to be used by the technician doing the measurement? Will they measure whether the economizer is opened or closed? Regardless of what they do, this information needs to be on here.

Pete Jacob (BMI) – This is inventory data. We are looking at specifically what kind of economizer is on the unit. One way it may be used is to look at change-out opportunities, especially the make and models that have difficult reliability records. The data collected here has nothing to do with operations and is simply an inventory at this point.

### Controls (3.38):

Skip Ernst (Daikin Applied) – There can be different interpretations: electrical mechanical vs. DDC; VAV vs. constant volume.

Pete Jacobs (BMI) – The way we address this issue in the RI spec is to call out specific items that you might find in a pick list and where *other* can be an option. However, we need to be more specific here.

### In-Field Airside Benchmarking Data:

Pete Jacobs (BMI) – Specific test data; series of test types depending on particular active and scope of services, whether it is a benchmark for the unit or system; routine and on-going maintenance. This is consistent with the installation spec with some additional test in types included.

### Air-side Pressures:

Pete Jacobs (BMI) – Collecting data to ensure that the state-of-the-distribution system is the same since the last maintenance check. If scope of services includes distribution system (full and not unit), do we want to include for the register both individual and total on the supply and return side? In addition, how frequently does one redo some register-level measurements?

Ben Lipscomb (NCI) – If changes to space, equipment should alert you to any changes. Recommend performing measurement once at commissioning or recommissioning.

Economizer:

Pete Jacobs (BMI) – Basic economizer test data; verifying that the outside air is appropriate. At this point, we plan to be fairly agnostic about which measurement method is used since it will be a task of the CI group. Pete Jacobs (BMI) noted that determining the minimum air position is difficult to quantify.

Outside Air Temperatures: *(It was noted that the economizer damper positions may change over time.)*

Pete Jacobs (BMI) – The positions of the dampers can be tricky. My understanding is that there are more direct drive economizers in the market, not much linkage-based systems. However, Ben Lipscomb (NCI) posited that even direct drives with gears made of plastic can get *messed up* relative to their signal. He offered a solution:

1. Place a mark/sticker on the side of the economizer where the angle of the damper should be for the minimum position or as recommended by another Working Group in 2015.
2. Place a mark/sticker on the opening of the damper where you made a measurement and record that measurement as a data point—from blade to some fixed reference point.

Donald Prather (ACCA) – Given those recommendations, the only thing missing is the bypass and the relief. If they change, that can be the same value or a different value. There could be multiple dampers on a unit (not just one) and the dampers' positions and this changes the air flow. Furthermore, these damper positions are not currently being checked.

Pete Jacobs (BMI) – Agree that marking the damper position is critical and clarified that if outside air is measured once, there is no need to re-measure, unless someone has made changes. This will trigger a re-measurement; we do not want to get too deep into the procedures.

Skip Ernst (Daikin Applied) – The single-point wet bulb measurement is also problematic

Pete Jacobs (BMI) – There will be a healthy discussion on instrumentation/measurement techniques and measurement errors as part of a task undertaken by the CQI Committee. This will also have use across other committees. Currently it is the field instruments that read out wet bulb measurements.

Donald Prather (ACCA) – For damper positions, I recommend placing a mark at the place where the measurement was taken the previous time.

Pete Jacobs (BMI) – Placement bias washing out if you take the measurement the same place each time.

Electrical Data Section: *(Product of the maintenance working group was added to the spec)*

Donald Prather (ACCA) – What happens with the variable speed condensers and compressors on this set up? You can have something running at a lower speed than before and you cannot tell the difference by looking at it.

Pete Jacobs (BMI) – The idea is to set everything in full cooling. Com equipment in the field is probably multi stage; most are constant volume multi-stage or single stage. Have to figure a way to jump into full cooling and full flow for testing purposes.

Donald Prather (ACCA) – That needs to be clearly stated here.

Skip Ernst (Daikin applied) – That needs to add return and exhaust fans.



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### Refrigerant Cycle Data:

Donald Prather (ACCA) – As a good starting point, need to look at Energy Star’s check sheet.

### Combustion System Data:

Norm Stone (Clean Energy Horizons) – Recommends that someone from the California IOUs review this section.

<b>Closing Comments/Adjournment</b>
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### Action Items:

- Pete Jacobs (BMI) to incorporate comments provided in today's meeting and distribute draft document to WG members on 5/19 for their review.
- Members to review draft document and send suggested edits and comments to Pete Jacobs (BMI) no later than Friday, June 2, 2017.
- Pete Jacobs (BMI) will incorporate group’s comments and edits and send a revised spec to the CQM committee.

A follow-up meeting will be scheduled, if needed.

The meeting adjourned at 12:06 p.m. PDT.

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