Jeff Miller - RE: 2013 - elimination of standard flow hoods - answering stakeholder objections/concerns

From: Rick Chitwood <rick@chitwoodenergy.com>
To: 'John Proctor' <john@proctoreng.com>, 'Jeff Miller' <Jmiller@energy.ca.gov>
Date: 1/26/2012 7:44 AM
Subject: RE: 2013 - elimination of standard flow hoods - answering stakeholder objections/concerns
CC: 'Gary Flamm' <gflamm@energy.ca.gov>, 'Martha Brook' <Mbrook@energy.ca.gov>, 'Maziar Shirakh' <Mshirakh@energy.ca.gov>, 'BruceWilcox' <bwilcox@lmi.net>

Jeff,

My comments also inserted.

Rick

From: John Proctor [mailto:john@proctoreng.com]
Sent: Wednesday, January 25, 2012 8:50 PM
To: 'Jeff Miller'; 'Rick Chitwood'
Cc: 'Gary Flamm'; 'Martha Brook'; 'Maziar Shirakh'; 'Bruce Wilcox'
Subject: RE: 2013 - elimination of standard flow hoods - answering stakeholder objections/concerns

Jeff

Below are my thoughts on the matter.

Rick is a good source, so is Iain Walker.

John

From: Jeff Miller [mailto:Jmiller@energy.ca.gov]
Sent: Wednesday, January 25, 2012 7:20 PM
To: Rick Chitwood
Cc: Gary Flamm; Martha Brook; Maziar Shirakh; Bruce Wilcox; John Proctor
Subject: 2013 - elimination of standard flow hoods - answering stakeholder objections/concerns

Rick,
Since we have proposed (for 2013 Standards update) to eliminate use of standard flow hoods from the available system airflow measurement options in RA3.3, we have begun to receive comments from HERS raters expressing opposition to that change.

I met with Bill Pennington and Martha Brook today to discuss our justification for the change, and to discuss a course of action to address the stakeholder concerns, and we thought you might be able to help us. Do you have time to assist with the following topics? Any method of response that is easiest for you is fine - phone/email/webex.

1) Flow Grid: We want to know more about the limitations on use of the flow grid device http://energyconservatory.com/download/trueflow.pdf for measuring air handler (cooling coil) airflow. Is it likely that there are field conditions for which the flow grid cannot not be used? Could you describe some of those field conditions that preclude use of flow grid, and recommend/describe the next best alternatives or adaptations?

For the 2013 RA3.3 airflow measurement protocol for Flow Grid, we have said: "Multiple flow grids may be used for systems with multiple returns (note: probably should change to shall). And If multiple flow grids are used Qgrid is the sum of the flows through the flow grids". From Energy Conservatory True Flow manual: If there are multiple returns in the duct system, the only way to use the TrueFlow Meter is to simultaneously install a TrueFlow Metering Plate at each of the returns. Do you agree that we must require multiple flow grid devices be used for multiple return grill systems?

John – No the flow grid can also be used at the unit and will measure all flows through the unit. HERS raters clearly are expected to go into the attic for many reasons.

Rick – Sometimes the flow grid is tricky at the unit since the return plenum covers the furnace filter slot on many installations. Since the installer will have to measure and record the airflow on a CF-6R they will have to figure this out at time of installation. If there are three returns they may get smart and leave the filter slot accessible – because it will be easier. RA3.3 (which I haven't looked at recently) should say multiple flow grids can be used but must be used simultaneously.

I note in the Energy Conservatory manual, the TrueFlow is said to be "comparable accuracy to the Duct Blaster isolated return method" (plenum pressure matching method).

2) Plenum Pressure Matching (PPM): We hear (from various comments and communications) that the plenum pressure matching method of airflow measurement is not desirable either because it is difficult/clumsy to perform, or does not give consistent results, or is not truly as accurate as the research has reported (recall, we have considered Plenum Pressure Matching to be the most accurate of the methods in RA3.3). We suppose the HERS trainers have not promoted this method, and we thought the Commission could promote more training to be made available so that this method would be better understood/accepted. Since the basic

duct blaster setup for PPM could also be used for the duct leakage protocol, it seems this method is easy to perform => do you have any insight into why raters nonetheless consider this protocol difficult to perform or inaccurate?

John—The pressure matching method is not difficult when you are setting up for a duct sealing test anyway. It does mean you have to get into the attic. It is the most accurate method we know of other than hauling around a set of flow straighteners and ASTM nozzles.

3) Standard Flow Hoods: Do you know of research other than the LBNL research given by the links below that characterizes the accuracy/reliability of standard flow hoods?

http://epb.lbl.gov/publications/lbnl-45959.pdf

http://epb.lbl.gov/publications/lbnl-47382.pdf

http://eetd.lbl.gov/ie/pdf/LBNL-51550.pdf

http://epb.lbl.gov/publications/lbnl-51551.pdf

http://www.aceee.org/proceedings-paper/ss02/panel01/paper27

4) Super accurate Flow Hoods?: Do you know of any make/model flow hood (other than powered flow hood) that is considered to be significantly more accurate than the standard flow hoods generally available? If such a product was available, we may need to understand the criteria by which some flow hoods could be approved for use but other models not approved.

5) Flow Hood Standards: Do you know of any Flow Hood Standards that would support a method of test to certify the accuracy of flow hoods. Iain Walker has proposed doing research to develop such a standard.

Rick – Flow hoods, to be accurate, must be calibrated to the specific grill flow characteristics. To do this you must do a Pitot-tube traverse in a straight smooth duct, determine the air flow, and adjust the flow hood to the measured flow. California residential system never have "straight smooth" duct so there won't ever be a way to use flow hoods accurately. I think it is interesting that my flow hood calibration range is from 0.25 to 1.99 – a big range.

6) Powered Flow Hoods: We are aware of the new product advertised by Energy Conservatory http://energyconservatory.com/download/flowblaster.pdf which is designed to measure supply, return and exhaust flow from 10 to 300 CFM. And the Duct Blaster User Manual describes powered flow hood methods for measuring total system airflow at the return grille by fabrication of a flow capture enclosure out of cardboard - see ch 13 in DB manual: http://energyconservatory.com/download/dbmanual.pdf . We suppose as a starting point, it should be pretty easy for a HERS Rater to make a flow capture enclosure out of cardboard, and perform a powered flow hood airflow measurement at the return grille. Is

this a reasonable expectation? do you have any comments/concerns?

John – They could do that. After a while they would get tired of the clumsiness.

Rick – The FlowBlaster (powered flow hood) is available now for an addition to a DuctBlaster for $1,100.00 – cheaper than any flow hood available. It works great – we have been using a prototype for over a year.

7) Other flow capture device attachments for the duct blaster: I was wondering if Energy Conservatory would provide a powered flow hood attachment for the duct blaster that could be used for measuring full system airflow at the returns (I will inquire). Do you know of any flow capture attachments commercially available that could be easily adapted for use with a duct blaster? Cost? Perhaps a source for replacement flow capture enclosures for standard flow hoods that could be adapted to the duct blaster easily?

John – Flow capture hoods come in all sizes and they can fit a variety of return grilles. However they will never fit all situations.

Rick – The Energy Conservatory has sold (for years) a mounting plate for the DuctBlaster fan to be put at the return – so you can do leakage and flow with one set-up. The fan will only test up to about 1,800 CFM so it may not work on a great 5 ton system – a rarity.

Thanks in advance for any assistance with these topics.
jeff

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