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Commissioner Jackalyne Pfannenstiel  
Commissioner Arthur H. Rosenfeld, Ph.D.  
California Energy Commission  
1515 Ninth Street  
Sacramento, CA 95814-5512

Subject: Comments on Proposed 15-Day Language for Proposed 2008 Standards

Dear Commissioners Pfannenstiel and Rosenfeld:

**1. Residential ACM (RACM) Section 3.11.4:**

Section 3.11.4 in the RACM indicates that the maximum cooling capacity credit must be in combination with verified cooling coil airflow and sealed and tested ducts.

Table RA2-1 of the Reference Residential Appendix RA2 indicates that the maximum cooling capacity credit must be in combination with verified cooling coil airflow, sealed and tested ducts and high EER.

Which requirement is valid?

I think the elimination of the refrigerant charge as an additional compliance requirement is a mistake. The original intent of the additional compliance requirements was to insure the installation quality of both the duct system and the air conditioning equipment. Eliminating the refrigerant charge relaxes the installation quality standard for the air conditioning equipment. The logic seems to be a high EER will substitute for an improperly functioning air conditioner. The higher EER will reduce the air conditioner demand at time of peak but it will not increase the reduced cooling capacity of an air conditioner with an improper refrigerant charge.

**2. RACM Section 3.11.6:**

The requirement for duct design verification by the HERS rater has been eliminated from section 3.11.6 in the RACM.

Section RA3.3.3.2 in the Reference Residential Appendix RA3 requires duct design verification by the HERS rater.

Since duct design is a mandatory measure it would seem appropriate to continue the HERS rater verification of the duct design. The precedent for HERS rater verification of mandatory measures in conjunction with a HERS verifiable measure is already established. A HERS rater is currently required to verify – (1) the proper use of sealants for duct system joints and (2) the improper use of building cavities to convey air – when sealed and tested ducts is used as a compliance measure.

**3. RACM Section 3.11.8:**

Default EER should be increased to correspond with the current 13.0 SEER standard. An appropriate default would probably be something in the range of 10.5 to 10.8 EER. An average quality 13.0 SEER air conditioner should probably have an EER in the range of the proposed default. If the default is not increased, there is a built-in EER credit for just complying with the current 13.0 SEER standard.

4. **RACM Section 3.12.1:**

The requirement for cooling coil airflow verification by the HERS rater has been eliminated from section 3.12.1 in the RACM. There is still a requirement for duct design verification by the HERS rater in this section RACM. The physical verification of the duct design by the HERS rater does not guarantee that the cooling coil airflow will meet the standard. If there is any concern about cooling coil airflow then:

- Either the group of duct system credits described in this section of the RACM should be in combination with verified cooling coil airflow;
- Or, continue the HERS rater verification that the cooling coil airflow meets the standard.

5. **RACM Section 3.12.4:**

Under 2005 Standards, the two buried duct compliance measures must be used in combination with sealed & tested ducts and quality insulation installation.

Section 3.12.4 of the RACM does not specifically require sealed and tested ducts as a requirement for buried ducts. This section indicates that duct systems meeting the requirements for High Insulation Quality and the Procedures for Field Verification and Diagnostic Testing of Air Distribution Systems may take credit for increased effective insulation duct insulation. The Procedures for Field Verification and Diagnostic Testing of Air Distribution Systems contain installation verification and diagnostic testing procedures for sealed & tested ducts and buried ducts, so does this automatically mean the buried ducts must meet the requirements for sealed & tested ducts. Based on this logic, then sealed & tested ducts must meet the requirements for buried ducts.

6. **RACM Chapter 3 - General:**

There are numerous citations of references or sections in references that are invalid.

7. **Reference Residential Appendix (RRA) RA2:**

Specify the sampling rate for new construction when the dwelling unit has a combination of HERS measures that qualify for 1 in 7 and 1 in 30 sampling rate. Example being a dwelling unit that uses sealed & tested ducts, high EER and quality insulation installation to meet the performance standards. Sealed & tested ducts qualify for 1 in 30 sampling if the contractor is a certified Third Party Quality Control Program (TPQCP) contractor. High EER and quality insulation installation are measures that currently do not meet standards to qualify as TPQCP measures. Under these circumstances the dwelling units will be in two different sample groups.

8. **RRA RA3.1 – Section RA3.1.4.2.2:**

The requirement for cooling coil airflow for new construction has been reduced from 400 CFM/Ton to 350 CFM/Ton. If 350 CFM/Ton is now considered sufficient to meet air conditioning standards for new construction, then 350 CFM/Ton should also be the nominal airflow standard for air conditioning for sealed & tested ducts. Although the proposed requirement for cooling coil airflow for alterations is 300 CFM/Ton, it is probably better to use a single standard. So 350 CFM/Ton should be the nominal airflow standard for air conditioning for sealed & tested ducts for both new construction and alterations.

9. **RRA RA3.1 – Section RA3.1.4.3.8:**

The following inspection standards are part of the nonresidential visual inspection standards (Reference Nonresidential Appendix NA2 – Section NA2.3.8.4):

Visually inspect to verify that portions of the duct system that are excessively damaged have been replaced. Ducts that are considered to be excessively damaged are:

- Flex ducts with the vapor barrier split or cracked with a total linear split or crack length greater than 12 inches
- Crushed ducts where cross-sectional area is reduced by 30% or more
- Metal ducts with rust or corrosion resulting in leaks greater than 2 inches in any dimension
- Ducts that have been subject to animal infestation resulting in leaks greater than 2 inches in any dimension

These same visual inspection standards are part of the 2005 residential duct test and verification standards. These visual inspection standards have been eliminated from the proposed 2008 duct test and verification standards. If these visual inspection standards are still appropriate for nonresidential then they certainly should be appropriate for residential, especially considering the density of residential duct systems versus nonresidential duct systems.

The above visual inspection standards should be retained in the residential duct test and verification standards.

**10. RRA RA3.4:**

Include the requirement that the installing HVAC contractor provide the ARI Reference # on the Installation Certificate for high EER compliance.

**11. RRA RA3.5:**

Section 3.5.1 indicates that this quality installation insulation compliance credit is limited to wood frame structures and that the insulation type is limited to mineral fiber and cellulose. Reference Joint Appendix JA7 the field verification procedure for spray polyurethane foam allows for both wood and metal frame structures.

Is the quality installation insulation compliance credit for mineral fiber and cellulose insulation going to remain limited to wood frame structures?

Based on Reference Residential Appendix RA3.5 and Reference Joint Appendix JA7, insulation use for the two quality installation insulation compliance credits is limited to mineral fiber, cellulose and spray polyurethane foam. Based on these standards the newer insulation types used in “Green” construction practices do not qualify for the quality installation insulation compliance credit.

**12. Installation Testing and Verification Standards:**

Reference Residential Appendix RA2 (Section 2.5) indicates that the installation of measures requiring HERS verification or diagnostic testing must be done utilizing the procedures specified in Reference Residential Appendix RA3.

Currently there are 20 measures requiring HERS verification or diagnostic testing. Of those 20 measures only 12 have verification or diagnostic testing procedures in Reference Residential Appendix RA3. Two measures have verification or diagnostic testing procedures in Reference Residential Appendix RA4. One measure has verification or diagnostic testing procedures in Reference Joint Appendix JA7. One measure has verification or diagnostic testing procedures from ASTM. Four measures do not have verification or diagnostic testing procedures, they are as follows:

- All ducts in conditioned space
- Less than 12 lineal feet of ducts in unconditioned space
- Supply duct surface area reduction
- Maximum cooling capacity

**13. The 60% reduction duct testing standard:**

There should be a cap on the allowed leakage rate from the initial duct system test. If the initial duct system test indicates that the duct system leakage rate is in excess of 60% for example, then the duct system must qualify for compliance using the “Seal All Accessible” standard.

HERS rater observation of the initial duct system test is the only way the initial duct system test results can be validated. Under any other circumstances, the initial duct system test results can be fabricated to meet the needs of the final duct system test results.

**14. Verification of Charge Indicator Display (CID):**

As indicated in Reference Residential Appendix RA3.4, the verification of the CID is a visual inspection. The verification protocol limits the HERS rater to only the determination that the CID is installed. This is the same type verification process that created all the problems of improper installation of the TXV.

**15. Reference Nonresidential Appendix NA2:**

The following is a suggested change for of the labeling requirement for nonresidential duct systems (Section NA2.3.8.5):

The leakage of the air distribution ducts was tested using the procedures prescribed in Reference Nonresidential Appendix NA2.

This system (check one):

Has a leakage rate less than 6% leakage for new duct systems or less than 15% leakage or the leakage was reduced by more than 60% for alterations to existing systems. It meets the prescriptive requirements of California Title 24 Energy Efficiency Standards.

Has a leakage rate greater than 15% leakage or the leakage reduction exceeds 60% for altered existing systems. It does NOT meet the prescriptive requirements of the Title 24 standards. However, all accessible ducts were sealed.

The current language that is proposed has several problems:

- First, the language did not include the compliance option of 60% leakage reduction.
- Second, new duct systems must pass the less than 6% standard, there is no exception.

Sincerely,



Steve G. Mohasci