

May 31, 2012

CALIFORNIA ENERGY COMMISSION
Dockets Office, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

DOCKET	
12-BSTD-1	
DATE	<u>MAY 31 2012</u>
RECD.	<u>MAY 31 2012</u>

RE: Docket No. 12-BSTD-1
Adoption of 15-Day Language for the 2013 Energy Efficiency Building Standards

Dear CEC Staff:

UTC Climate, Controls & Security and its Carrier business unit appreciate the opportunity to comment on California Energy Commission's document CEC-400-2012-004-15 Day. Carrier is the world's leader in high technology air conditioning, heating and refrigeration systems, employing 11,000 Americans.

Comment 1 – Certification Requirements for Manufactured Equipment, Products, and Devices (Section 100.0(h)(3)(A) – page 34)

In subsection (h)(3)(A) it seems to state that all central air-conditioning heat pumps and other central air conditioners must be certified. Many of the products are certified, but not all products and capacities are currently certified. Suggest clarifying this point and referencing the appropriate certification programs.

Comment 2 – Integrated Energy Efficiency Ratio (IEER) definition (Section 100.1(b) – pages 54 and 55)

The definition is incomplete. Suggest copying the definition from AHRI 340/360 and clarifying that it applies to products covered by AHRI 210/240, AHRI 340/360, and AHRI 1230.

Comment 3 – Controls for Heat Pumps with Supplementary Electric Resistance Heaters (Section 110.2(b) – page 80)

Agree with this requirement pending clarification of the terminology for “preferential rate control” used in Exception 1.B. Per our interpretation of this requirement, a conventional two-stage thermostat can provide this functionality. If this is not what is intended, then suggest revising the wording accordingly.

Reference – page 80:

(b) **Controls for Heat Pumps with Supplementary Electric Resistance Heaters.** Heat pumps with supplementary electric resistance heaters shall have controls:

1. That prevent supplementary heater operation when the heating load can be met by the heat pump alone; and

2. In which the cut-on temperature for compression heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for compression heating is higher than the cut-off temperature for supplementary heating.

EXCEPTION 1 to Section 110.2(b): The controls may allow supplementary heater operation during:

- A. Defrost; and
- B. Transient periods such as start-ups and following room thermostat setpoint advance, if the controls provide preferential rate control, intelligent recovery, staging, ramping or another control mechanism designed to preclude the unnecessary operation of supplementary heating.

Comment 4 – Electrically Operated Unitary Air Conditioners and Condensing Units – Minimum Efficiency Requirements (Table 110.2-A – page 84)

Table still includes a provision for higher efficiencies for federally covered products after 1/1/2015. This may constitute a violation of federal preemption; accordingly, suggest that it be removed.

Comment 5 – Electrically Operated Unitary Air Conditioners and Condensing Units – Minimum Efficiency Requirements (Table 110.2-A – page 84)

For air conditioners, evaporatively cooled in the size category >65,000 Btu/hr and <7135,000 Btu/h suggest correcting to 65,000 Btu/hr and <135,000 Btu/h.

Comment 6 – Electrically Operated Unitary Air Conditioners and Condensing Units – Minimum Efficiency Requirements (Table 110.2-A – page 84)

Footnote “a” is incorrect. The IEER applies to all products including single stage machines as defined in AHRI 340/360 and AHRI 210/240. Suggest removing this footnote.

Comment 7 – Electrically Operated Variable Refrigerant Flow Air-to-Air and Applied Heat Pumps – Minimum Efficiency Requirements (Table 110.2-I – page 101)

Footnote “a” is still incorrect. The IEER applies to all products including single stage machines as defined in AHRI 1230. Suggest removing this footnote.

Comment 8 – Economizer Fault Detection and Diagnostics (FDD) (Section 120.2(i) – page 139)

Pressure sensors are not required by the standard. Suggest removing the requirements for accuracy.

Comment 9 – Economizer Fault Detection and Diagnostics (FDD) (Section 120.2(i) – pages 139 and 140)

Requirements in item 5 and 8 state the same requirements. Suggest eliminating one of the sections.

Comment 10 – Economizers, (Section 140.4(e)(1) – page 214)

Disagree that 100% of the design supply air for a VAV system is necessary. Building modeling will show that the air terminals are never 100% open during periods when economizers are being used. Requiring that design supply air be the greater of 50% above the minimum outside air or 75% would be more appropriate and avoid over sizing the economizer and exhaust/return fans.

Comment 11 – Economizers, (Section 140.4(e)(4) – page 216)

Defines requirements for economizers for units with capacities greater than 45,000 Btu/h. The requirements of Title 24 only require economizers for units with greater than 54,000 Btu/h. Suggest changing requirements to 54,000 Btu/h.

Comment 12 – Economizers, (Section 140.4(e)(4)(H) – page 217)

Subsection 4.H requires relief systems to be capable of 100% outside air without over-pressurizing the building. This seems to indicate exhaust systems shall be sized to exhaust 100% of the design cfm when combined with the requirements on page 214. For VAV systems 100% exhaust air is not required (see Comment 10 above), and for constant volume systems there is always some leakage from other exhaust systems and the building envelope. Suggest revising to require exhaust systems to be capable of exhausting up to 90% of the maximum required economizer air.

Comment 13 – Zonally Controlled Central Forced Air Systems (Section 150.0(m)(15) – page 295)

Disagree with (1) the mandatory dictation of design requirements that require manufacturers to be limited to a specific CFM per ton ratio and (2) the requirement that all equipment airflow be greater than 350 cfm/nominal ton. The following items are presented for consideration:

- System efficiency optimization and performance may require airflows less than 350cfm/nominal ton.
- The ratio of airflow to capacity (and thus efficiency) changes over time with the change in building designs and equipment designs. Furthermore, different ratios are required for different equipment applications.
- Many manufacturers' current equipment are rated in accordance with AHRI procedures at nominal airflows of 325 CFM/nominal ton or less. This is particularly true for equipment that must operate in both arid and humid applications regardless of the geographical location.
- For systems with multiple zones, not every zone will require airflows greater than 350 cfm/nominal ton.
- This does not allow reasonable means to design, rate and verify equipment with variable speed compressor systems. The wording in the Exception below is in direct conflict with the existing AHRI rating procedures. Furthermore, this requirement provides no standardized method for "demonstration of compliance" on the jobsite, nor does it account for varying duct static pressure conditions.

Reference – page 295:

15. Zonally Controlled Central Forced Air Systems. Zonally controlled Central forced air cooling systems shall be capable of simultaneously delivering demonstrate, in every zonal control mode, an airflow from the dwelling, through the air handler fan and delivered to the dwelling, of greater than 350 CFM per ton of nominal cooling capacity, and operating at an air-handling unit fan efficacy of less than 0.58 W/CFM as confirmed by field verification and diagnostic testing in accordance with the procedures specified in Reference Residential Appendix RA3.

EXCEPTION to 150.0(m)15: Multi-speed compressor systems or variable speed compressor systems shall demonstrate compliance for airflow (cfm/ton) and fan efficacy (Watt/cfm) by operating the system at maximum compressor capacity and maximum system fan speed and with all zones calling for conditioning.

Comment 14 – Field verification of system performance on (Section 150.1(b)(4)(B) – page 304)

Disagree with this requirement for field verification of system performance. There is no proven accurate method of field verification for equipment rated in accordance with DOE / AHRI test procedures. If the intent is to ensure verification of specific manufacturer requirements, such as proper system charging, suggest revising the requirement accordingly.

Reference – page 304

- B. Field verification of installed features, materials, components, manufactured devices, or and system performance shall be documented on applicable Certificates of Installation pursuant to Section 10-103(a)3, and applicable Certificates of Verification pursuant to Section 10-103(a)5, in accordance with the following requirements when applicable:
- i. SEER Rating. When performance compliance requires installation of space a conditioning system with a SEER rating that is greater than the minimum SEER rating required by TABLEable 150.1-A, the installed system shall be field verified in accordance with the procedures specified in Reference Residential Appendix RA3.4.4.1.
 - ii. EER Rating. When performance compliance requires installation of a space conditioning system that meets or exceeds a specified EER rating, the installed system shall be field verified in accordance with the procedures specified in Reference Residential Appendix RA3.4.4.1.
 - iii. Low Leakage Air Handler. When performance compliance requires installation of a low leakage airhandling unit that meets the qualifications in Reference Joint Appendix JA9, the installed air-handling unit shall be field verified in accordance with the procedures specified in Reference Residential Appendix RA3.1.4.3.9.

If you have any questions please feel free to contact me at (615) 225-8152.

Carrier Corporation



Richard Lord