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On 45-day language for Title 24, Part 6 (2019)

Additional submitted attachment is included below.

March 05 2018

Docket No. 17-BTSD-02 – 2019 Building Energy Efficiency Standards – 45 day Language

Mark Alatorre, P.E. / CEC Staff
California Energy Commission - Efficiency Division

Dear Mark / CEC Staff:

Thank you for the opportunity to comment on the 2019 Building Energy Efficiency Standards – 45 day Language. ASHRAE TC8.6 (The Technical Committee for Cooling Towers and Evaporative Condensers) fully supports the increased usage of energy-efficient equipment and systems. ASHRAE Technical Committee TC 8.6 is concerned with cooling towers, evaporative liquid coolers and condensers, spray ponds, and other types of contact type liquid to air exchangers and applications to complete refrigeration systems, including water treatment. Working together with other Industry Stakeholder Organizations, such as the CTI, ASHRAE, and AHRI, TC 8.6 has a strong history of supporting measured increases in the efficiency of heat rejection equipment, inclusion of additional heat rejection equipment in Codes and Standards, and development of certification program for heat transfer equipment.

TC 8.6 appreciates the language in the 45-day draft of Title 24 2019 relative to evaporative heat rejection, including removal of the tighter approach requirements for waterside economizers, strengthening of the air cooled chiller limitation, and inclusion of clarifying language in the Code for the prescriptive requirement for open circuit cooling tower efficiency. We also are pleased that the latest analysis by the CEC Consultant supports a prescriptive minimum efficiency of 60 gpm/hp (except in two climate zones) for axial fan, open circuit cooling towers used in water cooled chiller systems over 300 tons, along with no increase in the current mandatory minimum efficiency of 42.1 gpm/hp. This is substantially less than the original proposal of 80 gpm/hp, which was a level that was certainly a very serious concern for the TC. Although higher than desired for the reasons contained in our comments of October 20 2017, this level will help to minimize potential unintended market shifts to less energy efficient cooling systems due to higher costs, a factor which is often neglected in such analyses. TC 8.6 also supports the harmonization of the minimum efficiency for axial fan closed circuit cooling towers with the value in Standard 90.1 – 2016 (16.1 gpm/hp).

TC 8.6 applauds the efforts of the CEC to include adiabatic condensers in Title 24-2019, which will help with our Technical Committee's efforts to include this class of equipment in Standard 90.1 and the IECC in the future. However, we do have concerns with the proposed Code language in Tables 120.6-B and 120.6-C, which establish a method of minimum sizing for adiabatic condensers based exclusively on the dry bulb and the dry heat rejection efficiency. We firmly believe that the minimum sizing criteria for the equipment should be based on the adiabatic (wet) operating conditions, with the saturated condensing temperature at or below the ambient dry bulb temperature (i.e., 95 °F Saturated Condensing Temperature (SCT), 95°F Outdoor Dry-bulb Temperature, 70 °F Outdoor Wet-bulb Temperature). Adiabatic condensers,

which are widely used in California, are designed to operate in wet-mode during Design Day (i.e. summer) conditions and as such, code requirements should be based on adiabatic criteria, not the dry rating condition. Minimum efficiency levels for both air-cooled and evaporative condensers have a summer condition selected to match their respective design summer-operating mode. For instance, an evaporative condenser is not rated with the spray pump off, nor are cooled condenser ratings based on an adiabatic condition. Proper rating of adiabatic condensers will help to ensure that there is no market confusion resulting from air cooled condensers utilizing the dry rating efficiency for adiabatic condensers for Code compliance yet never operating in the adiabatic mode.

Adiabatic condensers also enable lower system condensing temperatures than systems based on air cooled heat rejection – indeed, as mentioned above, the saturated condensing temperature should be at or below the ambient dry bulb. This will enable large ***system*** energy savings which are not possible with refrigeration systems utilizing air cooled condensers and consequent higher condensing temperatures. Keep in mind that the energy use by the compressors is many times that consumed by the condenser so lower design condensing temperatures are especially beneficial.

In addition, the CEC has proposed acceptance testing in the dry mode only using an air cooled condenser test standard (as there is currently not a test standard specifically for adiabatic condensers). As these units are designed for wet operation, which is where they save the maximum energy, we strongly suggest that adiabatic condensers be tested in the wet (adiabatic) mode. Alternatively, if the CEC desires to not make this modification to the 45-day language, and continues to call for adiabatic condensers to be tested in the dry mode, then the language should clearly state that the adiabatic pads should be removed during dry mode testing. This will place adiabatic designs more on par with air cooled condensers.

CTI Standard 201 also needs to be updated as follows in Section 101.1 and in Appendix 1-A (changes / additions in red):

Section 101.1

CTI STD-201 RS is the Cooling Technology Institute document titled "~~Standard for Thermal~~ Performance Rating ~~Certification~~ of Evaporative Heat Rejection Equipment," ~~2011 2015~~ 2017 (CTI STD-201 RS-17~~15~~).

Add for informative reference:

CTI STD-201 OM is the Cooling Technology Institute document titled "Operations Manual for Thermal Performance Certification of Evaporative Heat Rejection" 2017 (CTI STD-201 OM-17)

Appendix 1-A STANDARDS AND DOCUMENTS INCORPORATED BY REFERENCED IN THE ENERGY EFFICIENCY REGULATIONS

COOLING TECHNOLOGY INSTITUTE

CTI ATC-105-00 Acceptance Test Code for Water Cooling Towers (2000)

CTI STD-201 RS-171504 Standard for the Certification of Water-Cooling Tower Thermal Performance (20042015) Performance Rating of Evaporative Heat Rejection Equipment (2017)

CTI STD-201 OM-17 Operations Manual for Thermal Performance Certification of Evaporative Heat Rejection (2017)

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The reason for the above changes is that STD 201 has been divided into a separate rating standard (RS) and an operations manual (OM) for the certification program. Taken together, they function the same as the original STD 201. Note that Table 110.2-G, *Performance Requirements for Heat Rejection Equipment*, already lists CTI STD-201 RS in the "Test Procedure" column. In addition, the offices of the CTI were also relocated during this time period.

Finally, as mentioned in previous comments, most evaporative heat rejection companies have sales offices throughout the State of California to serve the market. Additionally, two of the three biggest firms in the Industry have large manufacturing facilities in California (in Madera) to serve not only California but markets in the Western United States, Canada, and Asia.

ASHRAE TC8.6 remains highly supportive of California's energy-efficiency initiatives as demonstrated in this and past Stakeholder reviews. Please let us know any questions you may have on our comments.

Sincerely,

ASHRAE TC 8.6 Subcommittee on Codes and Standards

Submitted by Frank Morrison
Chair, ASHRAE TC 8.6 Codes and Standards Subcommittee

cc: Voting Members of the Subcommittee:
Jon Cohen, ChemTreat
Stephen Kline, Baltimore Aircoil Company
Paul Lindahl, SPX Cooling Technologies
Mark Pfeifer, SPX Cooling Technologies
Allyn Troisi, Lakos, ASHRAE TC 8.6 Chair
Joe Vadder, Evapco
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