DOCKETED

Docket Number:	17-BSTD-02
Project Title:	2019 Title 24, Part 6, Building Energy Efficiency Standards Rulemaking
TN #:	223384
Document Title:	ASHRAE Comments Response to Title 24, 15 Day Language
Description:	N/A
Filer:	System
Organization:	ASHRAE
Submitter Role:	Public
Submission Date:	5/8/2018 8:28:06 AM
Docketed Date:	5/8/2018

Comment Received From: ASHRAE
Submitted On: 5/8/2018
Docket Number: 17-BSTD-02

Response to Title 24, 15 Day Language

Additional submitted attachment is included below.

ASHRAE TC08.06 (Cooling Towers and Evaporative Condensers) Response to Title 24 15 Day Language

May 07 2018

TC08.06 continues to applaud efforts to increase energy efficiency and support cost justified increases in minimum efficiency requirements that are in the best interests of our customers, our industry, and society in general. Having previously commented on several sections of the 2019 language in this cycle, we are limiting our comments here to updates to CTI Standards and Codes referenced within Title 24 along with concerns we continue to have relative to the minimum efficiency and rating of adiabatic condensers.

CTI Standards and Codes Update

Page 337 *APPENDIX 1-A STANDARDS AND DOCUMENTS INCORPORATED BY REFERENCED IN THE ENERGY EFFICIENCY REGULATIONS CODE*

COOLING TECHNOLOGY INSTITUTE

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

CTI ATC-105S-11 Acceptance Test Code for Closed Circuit Cooling Towers (2011)

CTI ATC-106-11 Acceptance Test Code for Mechanical Draft Evaporative Vapor Condensers (2011)

~~CTI STD-201-1504 Standard for the Certification of Water-Cooling Tower Thermal Performance (20042015)~~

CTI STD-201RS-17 Standard for the Certification of Water Cooling Tower Thermal Performance (2017)

Available from: Cooling Technology Institute

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SECTION 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION

CTI is the Cooling Technology Institute.

CTI ATC-105 is the Cooling Technology Institute document titled "Acceptance Test Code for Water Cooling Towers," 2000 (CTI ATC-105-00).

CTI ATC-105S ~~(11)~~ is the Cooling Technology Institute document titled "Acceptance Test Code for Closed-Circuit Cooling Towers," 2011 (CTI ATC-105-11).

CTI ATC-106 is the Cooling Technology Institute document titled "Acceptance Test Code for Mechanical Draft Evaporative Vapor Condensers", 2011 (CTI ATC-106 (11)).

CTI STD-201 RS is the Cooling Technology Institute document titled "~~Standard for the Thermal~~ Performance Rating ~~Certification~~ of Evaporative Heat Rejection Equipment," ~~2011~~ ~~2015~~ 2017 (CTI STD-201RS-~~1115~~17).

Note – all of the above standards / codes are referenced in Title 24 – 2019, such as in TABLE 110.2-G PERFORMANCE REQUIREMENTS FOR HEAT REJECTION EQUIPMENT.

Additionally, STD 201 was divided into STD 201 RS (Rating Standard) and STD 201 OM (Operations Manual):

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

STD-201 OM is not required for Title 24 but could be included as informative if desired.

Adiabatic Condensers

In addition to the CTI Standards update, the 15-day language in Table 120.6-C establishes a method of minimum sizing for adiabatic condensers based exclusively on the dry-bulb and the dry heat rejection efficiency. We agree with others in the Industry that minimum sizing criteria for this equipment should be based on adiabatic (wet) operating conditions, with the saturated condensing temperature at or below the ambient dry bulb temperature, for the following reasons:

- Changing this approach (i.e. not using typical design conditions in Title 24 to rate equipment) will create confusion for those designing the system. Adiabatic condensers are designed to operate in wet-mode during Design Day (i.e. summer) conditions, and are sized this way by Consulting Engineers. As such, code requirements should follow based on wet (adiabatic) criteria following the same logic for both evaporative and air cooled condensers. Efficiency criteria for air-cooled and evaporative condensers each have a summer-condition selected to match their respective design summer-operating mode.
- The Code does not establish the criteria for the performance of this equipment operating in the manner in which the CASE study was performed. All of the energy modeling that was performed in the CASE study to demonstrate the excellent benefit of adiabatic condensers to the State was done assuming wet performance in warm weather.
- As a result of establishing criteria based solely on dry performance characteristics of adiabatic condensers, energy consumption in California could actually increase, contrary to the intent of the Code and the potential of this equipment. *Dry criteria could incentivize some in the industry to design units with poor performance, or creatively modify or label air-cooled condensers into adiabatic hybrid units, potentially leading to the opposite outcome from the intent of this regulation.*

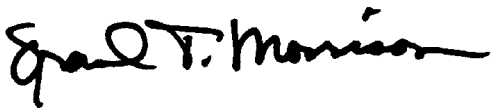
By rating a unit by the proposed method, above, the energy results of the CASE study could be maintained, confusion in the industry would be minimized, and as air-cooled condensers would have no (zero) capacity with this method, air cooled condensers could not be substituted for adiabatic units.

In addition, the 15 day language calls for acceptance testing in dry mode only using an air-cooled condenser test standard. As adiabatic condensers are designed primarily for wet operation, we suggest that adiabatic condensers be tested for compliance in the wet (adiabatic) mode rather than in dry mode as called for in the 15 day language. Should the CEC continue to require testing in the dry mode in the final wording, the final language should clearly state that the adiabatic pads can be removed during dry mode testing. This will place adiabatic designs more on par with air-cooled condensers when operated in dry mode.

We appreciate working with CEC Staff throughout this Code cycle to improve energy efficiency in the State of California in a fair and sustainable manner through Title 24 - 2019. We continue to look forward to bringing forth several meaningful energy saving proposals for the 2022 edition of Title 24 for the Commission's consideration early in the next code cycle.

Please feel free to contact me with any questions on our comments.

Best regards,



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