

DOCKETED

Docket Number:	17-BSTD-01
Project Title:	2019 Building Energy Efficiency Standards PreRulemaking
TN #:	221576
Document Title:	ASHRAE TC8.6 Comments On Draft 2019 Building Energy Efficiency Standards
Description:	N/A
Filer:	System
Organization:	ASHRAE TC8.6
Submitter Role:	Public
Submission Date:	10/20/2017 4:25:16 PM
Docketed Date:	10/20/2017

Comment Received From: ASHRAE TC8.6

Submitted On: 10/20/2017

Docket Number: 17-BSTD-01

On Draft 2019 Building Energy Efficiency Standards

Additional submitted attachment is included below.

October 20 2017

Docket No. 17-BTSD-01 – Draft 2019 Building Energy Efficiency Standards

Mark Alatorre, P.E.
California Energy Commission
Efficiency Division

Dear Mark:

Thank you for the opportunity to comment on the Draft 2019 Building Energy Efficiency Standards, presented by the California Energy Commission (CEC) on October 4, 2017. 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 TC8.6 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. Feel free to visit the TC Website at:

<https://tc0806.ashraetcs.org/>

TC 8.6 has the following comments on the Draft Standards:

Waterside Economizer Proposal – 140.4 (e)

The alignment of the requirements for waterside economizers with the requirements in ASHRAE Standard 90.1 – 2016 is fully supported by TC 8.6. Thank you for responding to the concerns expressed by Stakeholders on the original proposal. Note that we will primarily address our comments on the increase in cooling tower efficiency in the appropriate section below. However, please note that for systems equipped with waterside economizers, the winter (or economizer) design condition predominates on many projects, increasing the size, weight, height, and cost of the cooling tower over that required for only the summer duty. Requiring a further increase in minimum cooling tower efficiency to 80 gpm/hp, which also increases the size, weight, and cost of the cooling tower, increases the likelihood of significant layout issues (height, footprint, weight) on many projects.

Air Cooled Chiller Limitation - 140.4(j)

TC 8.6 appreciates the strengthening of the limitation on the use of air cooled chillers, which has been supported by numerous energy studies over the years. The removal of Exception 3 relieves some of the Industry concern due to the possibility of unintended market shifts

resulting from increases in minimum efficiency for cooling towers. We encourage the CEC to perform further independent studies in the future to expand the air-cooled limitation to limit other less efficient cooling alternatives in favor of more energy efficient technologies.

Encouraging the use of water cooled systems, whether water cooled chillers, water cooled heat pumps, or water cooled VRF not only increases energy efficiency, reduces peak loads, and moves California further toward a NZE future, but also contributes to providing a steady baseline water use that can help improve water quality in the distribution system as well as reduce the overall use of water required for thermoelectric power generation by reducing electricity use. Refer to the article below for additional information on the issues currently being experienced in the water distribution system:

<http://www.voiceofsandiego.org/topics/government/call-anti-drought-water-officials-hope-drive-water-usage/>

Increase in Minimum Efficiency for Axial Fan, Open Circuit Cooling Towers 140.4 (h) 6

Working together with other Industry Stakeholder Organizations, such as the CTI 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 programs for heat rejection and heat transfer equipment. For instance, the proposal to include adiabatic condensers in Title 24 2019 will help our efforts to include this class of equipment in Standard 90.1 and the IECC.

On this basis, we recommend a more measured increase in the minimum efficiency for axial fan, open circuit cooling towers that recognizes the concerns of the Industry. TC 8.6 is currently working on a proposal for Standard 90.1 2019 for an approximate 5% to 10% increase in the minimum efficiency for open circuit cooling towers (along with including other heat rejection equipment under 90.1 such as adiabatic condensers and dry coolers). TC 8.6, along with the Cooling Technology Institute, has taken a leading role in helping to move the Industry forward in the areas of energy efficiency and sustainability.

To summarize our reasoning from our early letter dated July 7 2017:

1. The cost premium is underestimated, significant, and will increase the cost of living and the cost of doing business in California.
2. The prevalent use of variable speed drives on axial fan open circuit cooling towers has not been properly accounted for and significantly reduces the expected savings.
3. The proposal represents a 90% increase in the minimum energy efficiency ratings, to a level nearly double that of ASHRAE 90.1, which would disallow over 50% of currently offered models (as per the latest Case Report), which some may consider a restraint of trade. Having a reduced universe of models to select from will limit the freedom of System Designers.

4. The cost premium of larger cooling towers will place an undue burden on HVAC systems with cooling towers without a corresponding increase in the energy efficiency of competing technologies, especially given that water cooled systems are already the most efficient available today.

Furthermore, we strongly urge that the specific wording of the proposal shown on page 26 of the Case Study be modified as shown below to honor the intent of the stated change and avoid confusion by users of the Code. This proposal only addresses and applies to axial fan, open circuit cooling towers used on chilled water condenser systems as described in the Case Report. The use of centrifugal fan cooling towers is already limited in Title 24 (as in Standard 90.1). There are applications where strict sound criteria must be considered and installations where units must be installed indoors using ductwork (such as for high security installations), both of which are allowed under the exceptions to the open circuit centrifugal cooling tower limitation (140.4 [h] 4). Adding the term “axial fan” will add clarity to any new requirement.

Required changes (shown as bold underline):

6. **Cooling Tower Efficiency.** New or replacement **axial fan**, open-circuit cooling towers serving condenser water systems **for chilled water plants** with a combined rated capacity of 900 gpm at design conditions, shall have a rated efficiency of no less than 80 gpm/hp when rated in accordance to the test procedures and rating conditions as listed in Table 110.2-G.

EXCEPTION 1 to Section 140.4(h)6: Replacement of existing cooling towers that are inside an existing building or on an existing roof.

EXCEPTION 2 to Section 140.4(h)6: Buildings in Climate Zone 1 and 16 that are not connected to a water economizer system

Finally, TC 8.6 recommends that the efficiency in the above paragraph be revised to approximately 48 gpm/hp, recognizing the positive impact of the air cooled chiller limitation in Title 24. Furthermore, in conjunction with this change, we recommend that the minimum efficiency for axial fan, open circuit cooling towers in Table 110.2-G be revised to approximately 44.2 gpm/hp, anticipating an increase in minimum efficiency for this class of equipment in Standard 90.1 2019. The latter change would apply to all axial fan, open circuit cooling towers covered by the Table, not just those used in chilled water condenser systems. Note that this level will be higher than that proposed for Standard 90.1. TC 8.6 has supported a higher efficiency in Title 24 as compared to Standard 90.1 in earlier Code cycles, again recognizing the Title 24 limitation on air cooled chillers. We believe that this combined proposal will offer similar savings compared to the current Case Study proposal.

Finally, note that most evaporative heat rejection companies have sales offices throughout the State of California to serve the market. Additionally, all three largest firms have manufacturing facilities in California (specifically in Madera and Brea) 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. We look forward to continuing to work with the CEC on these proposals.

Sincerely,

ASHRAE TC8.6 Subcommittee on Codes and Standards

A handwritten signature in black ink, appearing to read "Frank Morrison". The signature is fluid and cursive, with a prominent initial "F" and a long, sweeping underline.

Submitted by Frank Morrison, Subcommittee Chair

cc: Paul Lindahl, SPX Cooling Technologies
Mark Pfeifer, SPX Cooling Technologies
Joe Vadder, Evapco
Ron Wood, GSA
Stephen Kline, Baltimore Aircoil Company
Jon Cohen, ChemTreat

Allyn Troisi, Lakos, Chair of TC 8.6