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Comment Received From: ASHRAE TC 8.6 Codes and Standards Subcommittee
Submitted On: 7/14/2017
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on Non-Residential HVAC Measures for 2019 Standards

Additional submitted attachment is included below.

July 14 2017

California Energy Commission
Docket Unit, MS-4
Re: Docket No. 17-BTSD-01
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Docket No. 17-BTSD-01 – Non-Residential HVAC Measures for 2019 Standards

Dear Mark:

Thank you for the opportunity for ASHRAE TC 8.6 to submit comments regarding the proposal for Prescriptive Efficiency Requirements for Cooling Towers. We would now like to submit comments on the Waterside Economizer (WSE) measure also proposed for the 2019 Title 24 Standard, presented in the June 20, 2017 Stakeholder meeting. ASHRAE TC 8.6 (The ASHRAE Technical Committee for Cooling Towers and Evaporative Condensers) is concerned with cooling towers, evaporative liquid coolers and condensers, spray ponds, and other types of contact type liquid to air heat exchangers along with their application, including water treatment.

ASHRAE TC 8.6 fully supports the increased usage of energy-efficient equipment and systems. However, as with the proposal to substantially increase cooling tower efficiency, our TC has serious concerns with the stringency of the proposed requirements for WSE. First and foremost, the decrease in the approach requirements for both the cooling tower and the heat exchanger will result in substantial increases in size, weight, and fan horsepower. The requirement for a minimum efficiency of 80 gpm/HP will temper the increase in fan energy that may result from this proposal, but at the same time further increase the size and weight of the cooling tower. All these factors combine to make it difficult to apply waterside economization on many projects that can benefit from its application.

While cooling towers can be selected for close approach duties, the psychrometric properties of cold air associated with winter duties substantially increases the degree of difficulty to handle close approaches. For instance, a cooling tower selected to cool 95°F water to 85°F at a 78°F wet bulb has a 7°F approach (leaving water temperature from the cooling tower minus the entering air wet bulb). At 49°F wet bulb, the same cooling tower is only capable of a 14°F approach at the same 10°F range. This is why in systems with

waterside economizers, even under the current requirements found in Title 24 and Standard 90.1, the winter duty is often what determines the tower selection, not the summer duty.

Additionally, the study did not separate out the benefits and costs of each part of this proposal. For instance, the use of an integrated economizer versus non-integrated economizer mode will result in a substantial increase in the hours of economization and thus produce greater energy savings (though we believe that Title 24 already requires the use of an integrated economizer based on the current Code language). In addition, the benefits and additional costs of a closer approach and an increase in the minimum efficiency of cooling towers were not individually evaluated. When pointed out to the CASE Team during the Webinar, they committed to reevaluate the study to separate these effects.

It should also be noted that chillers run very efficiently with colder condenser water temperatures so the benefits of an economizer are offset to a large degree in the lower wet bulb regions, including between 45°F and 49°F. Furthermore, the use of supply air temperature reset allows the use of warmer chilled water temperatures, further offsetting the potential savings. Both of these factors must be taken into account in any analysis, which we believe will demonstrate that the proposal is not economical.

As with the minimum efficiency proposal for cooling towers, TC 8.6 continues to have concerns relative to the potential impact of further increases in the first cost of water cooled systems relative to lower efficiency alternative systems. As water cooled systems already provide the most efficient cooling method available, a review of lower efficiency systems would appear to be in order to potentially supplement the current limitation on air cooled chillers rather than trying to further improve the most energy efficient system.

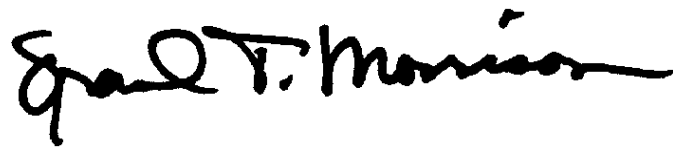
As currently drafted, the WSE proposal significantly increases the size, weight, and cost of both the cooling tower and the heat exchanger which will unfairly burden consumers who chose to utilize waterside economizers either due to preference or utility of function (which are many, including reduced potential for introduction of contaminants inside a building, reduced interior space required for ductwork, etc.). This burden also has the potential to lead to an unexpected market shift away from the use of waterside economizers and possibly water cooled systems in general. A more measured approach, such as the proposal currently being evaluated (but not yet implemented) by SSPC 90.1, should be evaluated. The proposal would call for a more reasonable increase in the required minimum efficiency of axial fan open circuit cooling towers only when used in waterside economizer systems, with no changes to the design temperature requirements for waterside economizers. Such a proposal, which would replace both of the cooling tower changes before the Commission, would reduce the potential for an unintended market shift to higher energy cooling systems

while allowing the Market, the Industry, and the CEC to evaluate any market impact going forward.

TC 8.6 has worked together with the California Energy Commission on energy saving proposals for many years now. We look forward to continuing to work with you and the Title 24 Team to advance energy efficiency in California in a rational and effective manner.

Sincerely,

ASHRAE TC8.6 Subcommittee on Codes and Standards

A handwritten signature in black ink that reads "Frank Morrison". The signature is written in a cursive style with a prominent initial "F" and "M".

Submitted by Frank Morrison, Subcommittee Chair