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July 7, 2017

California Energy Commission
Docket Unit, MS-4
Re: Docket No. 17-AAER-06
1516 Ninth Street
Sacramento, California 95814-5512

Re: AHRI Comments – Title 24-2019 Pre-Rulemaking June 20, 2017 Staff Workshop –
Non-residential Mechanical Proposals [*Docket No. 17-BTSTD-01*]

Dear CEC Staff:

These comments are submitted in response to the California Energy Commission (CEC) Staff Workshop on 2019 Nonresidential Energy Standards held on Tuesday, June 20, 2017, and the draft Codes and Standards Enhancement (CASE) report regarding proposals to update nonresidential measures in California's Building Energy Efficiency Standards (Title 24, Part 6).

AHRI is the trade association representing manufacturers of heating, cooling, water heating, and refrigeration equipment. More than 300 members strong, AHRI is an internationally recognized advocate for the industry, and develops standards for and certifies the performance of many of the products manufactured by our members. In North America, the annual output of the HVACR industry is worth more than \$20 billion. In the United States alone, our members employ approximately 130,000 people, and support some 800,000 dealers, contractors, and technicians. In addition to its activities as a global standards developer, AHRI works closely with other global codes and standards developers as well as utilities to ensure their access to the latest technology and innovation from the HVACR and water heating industry.

These comments include responses to the seven measures proposed by the Statewide CASE Team's to adopt requirements included in *ANSI/ASHRAE/IES Standard 90.1-2016 – Energy Standard for Buildings Except Low-Rise Residential Buildings* (ASHRAE 90.1-2016) as well as several other nonresidential proposals made at the June 20, 2017, staff workshop.

There was a very short deadline to provide comments in response to detailed CASE reports and to staff workshops. AHRI suggests that CEC hold a separate meeting to discuss measures in depth with industry. Additional time would certainly be helpful for industry to supply information requested by the Commission.

Harmonization and Market Impact

While the intent of the nonresidential HVAC proposals is to result in cost-effective enhancements to improve energy efficiency and energy performance in California buildings, it is not possible for California to achieve these goals without (1) including the increased cost of California-specific equipment to consumers or on the manufacturers in the market impact section of the analysis and (2) by proposing ventilation rates far above those in ASHRAE 62.1. The CEC ventilation rate increase of 130-percent above the ASHRAE 62.1 levels will result in a significant increase in energy use. AHRI urges CEC to properly account for the potential increase in cost of California-specific equipment and harmonize completely and thoroughly with ASHRAE standards, including 62.1.

ASHRAE 90.1 Measures

AHRI supports California adopting ASHRAE 90.1 content in a consistent and harmonized manner. While it is understood that ASHRAE 90.1 was developed to suit the nation, reviewing the measures suitable for California, or adapting measures to better suit California's climate zones is logical and appropriate, but to propose significant deviations from proposals developed through ASHRAE's consensus-building process under the umbrella of "ASHRAE 90.1-2016 proposals" is misleading. Several proposals stray far from the intent of the ASHRAE 90.1 measures and, if implemented, would negatively impact manufacturers of HVAC equipment by requiring multiple product design requirements to be implemented in different states.

Fan System Power

AHRI supports updating the fan allowances to be consistent with 90.1, but the total static allowance and fan power calculations should be completely harmonized with ASHRAE 90.1, including the minimum BHP / CFM. CEC's proposal only allows 0.82 BHP/1000 CFM for constant air volume applications while 90.1 requirements are 0.95 BHP/1000 CFM. A similar variation exists on VAV applications. The 90.1 minimums are challenging for packaged rooftop systems requiring exhaust or return fans that operate at design conditions. If rooftop units are unable to meet the minimum horsepower per airflow proposal, then an external exhaust/relief fan would be required. CEC's study does not consider these consequential costs. This situation would be problematic and costly on replacement applications.

Also, during the meeting, CEC stated that the base case in the CEC technical document assumes a MERV 9 filter; however, this is not consistent with the CEC's indoor air quality

proposal for areas exceeding the 2.5 micron (PM_{2.5}) threshold, where MERV 13 filters are being proposed for nonresidential buildings. AHRI urges CEC to update the model to show the energy impact the fan system power with the proposed air-filter level of MERV 13.

AHRI would also like CEC to provide additional information regarding the extent of these the PM 2.5 nonattainment areas which would require enhanced filtration, perhaps by releasing zip codes of affected areas. Lastly, is unclear what filtration level is being proposed for areas with better air quality. CEC should make this proposal clear.

Exhaust Air Heat Recovery

In the mild climate zones of California energy recovery is not cost effective. AHRI urges CEC to conduct a full cost-effective analysis regarding this measure and reconsider the proposal. In a similar study conducted by ASHRAE SSPC 90.1, it was shown that most applications are not cost effective at the 50-percent threshold and CEC's 60-percent proposal will be even less so, with DOAS being a notable exception.

Equipment Efficiencies

AHRI supports CEC adopting equipment efficiencies proposed in 90.1 into Tables 110.2A through 110.2K.

Waterside Economizers

During the June 20th meeting, several issues were raised regarding the proposal to update the waterside economizer requirements. First, a serious technical issue with the flows and temperatures used to conduct the analysis was raised during the Webinar. The CASE team committed to update the analysis with consistent temperatures and flows for the heat exchanger and cooling tower as well as to separately evaluate the impact of the increased cooling tower efficiency requirement from the impact of the closer temperature approaches.

As currently drafted, this 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. This burden also has the potential to lead to an unexpected market shift away from the use of waterside economizers. A more measured approach, such as the proposal currently being evaluated (but not implemented) by SSPC 90.1, should be evaluated. Such a 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.

It was also noted at the meeting that the proposed language inhibits the replacement of unitary equipment utilizing loop heat exchangers. AHRI urges CEC to update the analysis to reflect consistent requirements across all proposals and to fix code language to prevent

the unintended consequence of eliminating replacement equipment options for consumers.

Transfer Air for Exhaust Air Makeup

AHRI supports the proposal to use transfer air to supplement air to spaces that exhaust more than the amount of conditioned air required. While transfer air is usually the most energy efficient and least expensive makeup air source, AHRI urges CEC to focus on two caveats in order to harmonize with ASHRAE Standard 62.1: First, Section 5.9.2 of ASHRAE 62.1-2016 requires that a positive net pressure be maintained. If the rate of air exhausted from a space exceeds the outdoor air supplied to adjacent spaces, the outdoor air rate to the adjacent spaces will generally need to be increased to ensure the net building pressure is positive. Secondly, 62.1 limits the recirculation of lower quality air into spaces that contain air of higher quality.

Demand Controlled Ventilation for Classrooms

No comments.

Occupant Sensor Ventilation Requirements

No comments.

Cooling Tower Efficiency

AHRI is concerned that this proposal goes too far by increasing the minimum efficiency for axial fan, open circuit cooling towers from 42.1 gpm/hp to 80.0 gpm/hp and thus is not harmonized with ASHRAE Standard 90.1-2016. While we are encouraged that the proposal keeps replacement of existing building-mounted systems at 42.1 gpm/hp, we are very concerned with the potential for a market shift to less efficient alternative cooling systems due to the additional first cost and unit size / weight. AHRI is doubtful that the CASE report adequately evaluates the potential financial and site impact. For instance, the structural survey shows a 30 to 40-percent increase in unit weight resulting from this proposal.

Again, AHRI urges CEC to harmonize completely with ASHRAE Standard 90.1.

Economizer FDD for Built-up Air Handlers

No comments.

Conclusion

AHRI continues to urge CEC to harmonize proposals completely with ASHRAE 90.1 and 62.1, for climate zones where it does not have a negative market impact. We reiterate our request for a separate meeting to discuss proposals in depth, as two weeks was not sufficient for complete industry assessment.

AHRI appreciates the opportunity to provide these comments. If you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'LPG' with a stylized flourish.

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