DOCKET
10-BSTD-01
DATE SEP 26 2011
RECD. OCT 03 2011

CAL SMACNA

California Association Sheet Metal and Air Conditioning Contractors National Association

September 26, 2011

Ms. Martha Brook
California Energy Commission
Office of High Performance Buildings and Standards Development
1516 Ninth Street
Sacramento, CA 95814

Re: 2013 Building Energy Efficiency Standards: Proposed Revisions to Non-Residential Standards

Dear Ms. Brook:

On behalf of the members of the California Association of Sheet Metal and Air Conditioning Contractors' National Association (CAL SMACNA), I write to submit initial comments regarding the California Energy Commission's proposed revisions to the Building Energy Efficiency Standards contained in the California Code of Regulations, Title 24, Part 6. CAL SMACNA thanks the Commission for allowing a public workshop process to precede formal rulemaking and allow a full vetting of potential revisions by industry and the general public. We believe such a process is an invaluable forum for a robust consideration of the future of building energy efficiency standards and we deeply appreciate the opportunity to weigh in at this time.

CAL SMACNA is a non-profit trade association representing over 600 union sheet metal and air conditioning contractors who employ more than 25,000 men and women throughout the state of California. These contractors perform commercial and residential heating, ventilating, and air conditioning, manufacturing, and testing and balancing.

CAL SMACNA has performed an initial review of some of the Title 24 revisions that have been presented in the Commission's workshops including related feedback from our member contractors and consultants. At this point in our review, CAL SMACNA has identified four potential revisions we would like to bring to your attention as they have caused our members some concern. Those four revisions, which were originally presented at the Commission's April 11 public workshop, include: Data Center Economizers, Kitchen Ventilation, Laboratory Exhaust, and Outside Air and Demand Control Ventilation.

Please find attached our review of these four revisions, which lists our concerns and recommendations. We look forward to discussing these and other proposed revisions with you and your staff in the near future.

Sincerely,

Cyndi Marshall

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This document outlines the concerns and recommendations of CAL SMACNA with regard to the following four revisions to Title 24 proposed by the California Energy Commission (CEC), dealing with energy efficiency standards:

- Economizers for Data Centers,
- Kitchen Ventilation,
- Laboratory Exhaust, and
- Outdoor Air and Demand Control Ventilation Systems

I. ECONOMIZERS FOR DATA CENTERS

This revision states each cooling fan system serving a computer room must include either an air economizer or waterside economizer.

RECOMMENDATIONS:

1. Adopt a more regionally sensitive approach to encouraging waterside economizers, and
2. Clarify how the revision classifies new generation systems, such as direct (DX) and indirect (evaporative) cooling.

While we understand the general benefit to energy efficiency that economizers are capable of providing, CAL SMACNA is concerned that waterside economizers (WSE) are particularly sensitive to climatic conditions. In particular, studies have shown WSE provide minimal energy savings in warmer climates, such as in Southern California, or in higher-humidity climates, such as in the San Francisco Bay Area. On a statewide basis, air-side economizers consistently outperform WSE, leaving WSE to present superior energy savings only in relatively unique climatic settings. CAL SMACNA therefore urges a more regional approach to encouraging WSE.

CAL SMACNA also feels that the revision is unclear as to how new generation systems, such as DX and evaporative cooling, could be classified.

II. KITCHEN VENTILATION

Due to the multifaceted nature of this revision, CAL SMACNA's outline of concerns and recommendations is broken into five sections, each addressing one of the five proposals contained in the revision.

Proposal 1

This revision would clarify that kitchen ventilation is not an exempt process and should be addressed in Title 24.

RECOMMENDATION: None.

CAL SMACNA agrees that kitchen ventilation should not be an exempt process and that this topic should be addressed in Title 24.

Proposal 2

The revision would prohibit replacement air introduced directly into the hood cavity of kitchen exhaust hoods from exceeding 10 percent of the hood exhaust flow rate. CEC has explained that direct supply of greater than 10 percent in short circuit hoods can reduce capture and containment, requiring generally higher exhaust rates and higher room makeup rates to offset higher exhaust rates.

RECOMMENDATION: Title 24 should allow kitchen operators to use short circuit hoods.

Our experience suggests that short circuit hoods are not a common technology in California, as CEC also attests in its presentation of the revision. Where short circuit hoods are in use, commercial kitchens have generally found them to be the best option to suit their particular ventilation needs. Those needs typically include minimizing the energy costs and avoiding potential grease buildup that result from over-exhausting transfer air in some kitchen environments. In certain kitchen settings, short-circuit hoods have demonstrated the potential to provide superior efficiency by minimizing removal of conditioned makeup air. In fact, numerous models that are commonly used in today's market, and approved by independent testing and certification organizations such as United Laboratories and the National Sanitation Foundation, have been shown in tests to supply up to 70 or 80 percent non-conditioned makeup air internally into the hood capture area. This capability reduces heating and cooling costs of transfer air and more efficiently captures and contains grease and humidity.

Further, CAL SMACNA is not convinced that direct supply of makeup air leads to over-exhaust. Exhaust rates are prescribed by code based on square footage of the hood and type of cooking, among other factors. Whether a kitchen uses a non-short-circuiting hood or short circuit hood, the exhaust rate does not change. The presumption that short circuit hoods automatically lead to higher rates of exhaust underlie CEC's Life-Cycle Analysis, presented as part of CEC's presentation of this proposal, that compares the costs of a non-short-circuiting hood system with the costs of a short circuit hood system; the analysis arbitrarily doubles the exhaust from a short circuit hood relative to a non-short circuit hood. As a result, the presentation draws a clear picture of how CEC's flawed presumption that short circuit hoods over-exhaust led to the proposed prohibition of short circuit hoods.

In those relatively few kitchens that use short circuit hoods, CAL SMACNA believes reducing short circuit makeup air to 10 percent or less may require kitchens to condition the balance of the makeup air that is not directly introduced into the exhaust hood. CAL SMACNA therefore requests that CEC allow kitchen operators in those rare instances to seek the exhaust option that best suits their needs.

Proposal 3

The revision would prohibit mechanically cooled or heated makeup air delivered to any space with a kitchen hood from exceeding the supply flow required to meet the space heating and cooling load, or the hood exhaust flow minus the available transfer air from adjacent spaces, whichever is greater. "Available transfer air" is defined to mean that portion of outdoor ventilation air serving adjacent spaces not required to satisfy other exhaust needs, such as restrooms, not required to maintain pressurization of adjacent spaces, and that would otherwise be relieved from the building.

RECOMMENDATION: Transfer air in the dining or restroom areas should not be used in substantial amounts to cool the preparation area. While we appreciate CEC's inquiry to reducing energy costs associated with cooling and heating makeup air, we are concerned that measures to capture what is defined as "available transfer air" would disrupt the air balance between the preparation area and dining area of commercial kitchen, contributing to possible customer discomfort, contamination of the cooking area, and inefficiencies that end up costing more in energy. CAL SMACNA believes prudent kitchen

ventilation is premised on a separation of the preparation area and dining area as two distinct environments. Breaking the seal between these environments with substantial air transfers could compromise customer comfort, sanitation, and energy efficiency. Although we understand CEC's attempt to reduce energy use by moving conditioned air from the dining area to the preparation area, CAL SMACNA believes this revision may require air transfers that are much too large and the large quantities of transferred air may have adverse effects that far outweigh whatever energy savings may accrue.

Title 24 and ASHRAE Standard 62 currently do allow air transfers from the dining area to the preparation area. However, the amount of these air transfers is typically calculated to avoid contamination of the preparation area and increased cooling load in the dining area, and generally is around 5 percent. By proposing that a very large amount of air be transferred from the dining area to the preparation area using the required outside air from the air conditioning units, this revision neglects those priorities. With regard to energy efficiency in particular, the part of the revision exempting dining areas that use these air transfers from demand-control ventilation requirements implies a tacit admission that air balance in the dining area would be significantly and unpredictably impacted.

In addition to these potentially adverse effects of the revision, CAL SMACNA questions whether dining area air conditioners can substantially affect kitchen temperatures. The air that flows from the dining room air conditioning units to the preparation area would be approximately 75 degrees. Because a commercial kitchen requires a large quantity of air exhaust and makeup air due to the amount of heat and humidity produced during operation, dining area air conditioning units are unlikely to provide a substantial cooling effect to the kitchen. CAL SMACNA questions whether it is prudent to compromise comfort of customers, sanitation of food, and efficiencies of air balance, for the minor, if any, cooling effect that these air transfer can provide.

CAL SMACNA also questions how, under this revision, air will flow from the dining area to the preparation area. While typical coffee shops have pass thru windows, too much air passing through will cool foods and potentially reduce customer satisfaction. Additionally, high-end and buffet restaurants tend to have very little open passage for air to transfer from the dining area to the preparation area.

Proposal 4

The revision would place limitations on exhaust hood airflow rates. Specifically, this revision would establish maximum net exhaust flow rates per linear foot of hood length for each of a number of types of hoods, with each hood type's maximum rate depending on the kitchen equipment duty, which is also specified.

RECOMMENDATION: Keep regulation of cfm for kitchen hoods in the California Mechanical Code for consistency.

Previous versions of the California Energy Code have not addressed cfm for kitchen hoods, but the California Mechanical Code has requirements for Type 1 kitchen hoods. In the interest of simplicity and consistency, CAL SMACNA recommends CEC leave this matter for the Mechanical Code instead of adding different criteria in a different code. If the requirements in the Mechanical Code are incorrect, CAL SMACNA recommends changing that code instead of adding separate criteria to the Energy Code.

Proposal 5

This revision would establish requirements for controls for demand control ventilation or energy recovery.

RECOMMENDATION: Allow flexibility for the owner, kitchen designer, and mechanical engineer to agree on controls for demand control ventilation or energy recovery that work best for each building's unique needs.

The Energy Code should allow this as an option but not require it. CAL SMACNA recommends that the codes should not mandate the type of system or the type of controls required, but the requirements for the different types. The type of system or type of controls should be a discussion between the owner, kitchen designer, and mechanical engineer to agree on what works best for the building's needs.

III. LABORATORY EXHAUST

This revision states that buildings with laboratory exhaust systems where the minimum circulation rate to comply with code or accreditation standards is ten air changes per hour (ACH) or less, or less than the design exhaust airflow, must be capable of using variable air volume (VAV). The revision provides an exception that hoods can remain constant air volume (CAV) where required by code, the authority having jurisdiction, or the facility Environmental Health and Safety department guidelines.

RECOMMENDATION: Add an exception to the VAV requirement for certain types of laboratory hoods and biohazard applications that may be better served by CAV bypass hoods or fixed air balance.

While CAL SMACNA appreciates the exception being made for laboratory facilities with code, jurisdiction, or guidelines requiring CAV, we request an additional exception that explicitly addresses safety issues associated with certain types of lab hoods and biohazard applications that are better served by CAV bypass hoods or fixed air balance.

In addition to requiring VAV for certain laboratory facilities, CEC also contemplates requiring a project to include run around coils to precondition makeup air from laboratory exhaust systems within a prescribed range of total exhaust rate and minimum air change rate. CEC also contemplates prescribing a level of acceptable effectiveness of run around coils. CAL SMACNA appreciates the approach that CEC is taking which is sensitive to varying climate zones. Energy simulations that CAL SMACNA has performed on past energy projects demonstrate run around coils typically show limited benefit in Southern California. Where there is a number of intake and exhaust air ducts that must be piped for run around coils, the relatively warmer climates of Southern California may cause the benefits of run around coils to fall short of offsetting the higher fan and pump energy costs.

IV. OUTSIDE AIR AND DEMAND CONTROL VENTILATION SYSTEMS

This revision would change the nonresidential compliance manual and MECH-2A and MECH-6A acceptance testing forms to eliminate the field calibration option for CO2 sensors, add field verification of CO2 sensors to acceptance testing, confirm dynamic control of outside air, confirm pre-occupancy purge for all system types, verify proper location of outdoor air ducts in plenum systems, add guidance for measuring outdoor air flow, and correct CO2 sensor mounting height in compliance manual.

RECOMMENDATION: Forgo adopting the revision as it is overly prescriptive and would add significant costs without significant energy efficiency benefits.

We recognize the importance of thorough acceptance testing for demand-controlled ventilation, however CAL SMACNA believes these changes are overly prescriptive and could add unnecessary cost and complexity to the installation of air handling units. SMACNA contractors already take responsibility for the accuracy of their installed CO2 sensors and energy cost savings associated with demand-controlled ventilation. While SMACNA contractors already take the precautions outlined in this revision for most LEED-certified buildings, imposing these prescriptive requirements uniformly on air handling units could diminish the ability of SMACNA contractors to deliver their characteristic quality of work at fair costs.