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Serious Concerns with Proposal's Cooling Tower Energy Efficiency Requirements

See BAC's attached comments to the proposals, which I submitted to Stefan Gracik of Integral Group in March after participating in the Stakeholders meeting. Per the letter, we fully support initiatives to improve energy efficiency but have serious concerns with the proposal. After reviewing the CASE report, it appears that the following items in my attached letter have not been adequately addressed, including the following:

- There appear to be loop-holes for air-cooled and VRF systems, allowing their participation in projects for buildings greater than 900gpm. If loopholes are used, then the proposed increase to 80gpm/hp will disadvantage evaporative cooling in favor of less energy-efficient technology. Additionally, only evaporative cooling equipment has been addressed in this proposal while omitting other high-energy equipment, like boilers and electric heaters. The 80gpm/hp requirement may unfairly benefit alternate technologies and penalize those that would like to use evaporative cooling equipment to save energy, since it is inherently a very energy-efficient solution.
- Page v in CASE report: Incremental price premium for towers that meet 80gpm/hp is generally 15-20% compared to the current requirement of 40.2gpm/hp; it is very rare that the premium is less than 10%.
- Page 19 in CASE report: The weight increase seems unusually low and appears to be the installed weight rather than the operating weight. On a 2000gpm tower, the weight would increase from 25,000 lbs to 34,000 lbs, or a 9,000 lb increase. This would be close to a \$9,000 cost add, when scaling the listed numbers (current example indicates \$2,000 for 2,000 lbs). I do not feel that these are minimal costs and may discourage the use of water-cooled technologies or discourage construction in CA.

Additional incremental costs were not addressed, including the following:

- Increased height for barrier walls
- Water treatment chemicals and devices
- Replacement of parts, including higher volume of heat transfer material (fill)
- Increased maintenance costs due to larger units and basins

Similar to other comments, we propose the adoption of a more reasonable ratings requirement (e.g. ASHRAE 90.1 ratings). Thank you for your time, and please do not hesitate to contact me with any questions.

Additional submitted attachment is included below.



March 29, 2017

Stefan Gracik
Integral Group

Stefan,

Thank you for the opportunity to respond to your proposals for Prescriptive Efficiency Requirements for Cooling Towers and for Waterside Economizers. As a manufacturer of highly-efficient cooling towers, we fully support the increased usage of energy-efficient equipment. However, we would like address several concerns related to the significant increase in efficiency from 42.1gpm/hp to 80gpm/hp.

Efficiency Requirements for Cooling Towers

1. Proposed Efficiency Rating for Cooling Towers will Reduce System Efficiency

- a. The proposal represents a 90% increase in the minimum energy efficiency ratings, to a level nearly double that of ASHRAE Standard 90.1, which would disallow approximately 50% of offered models. Our current flexibility allows engineers to optimize energy usage for the entire system, including the chiller and pumps. By focusing on cooling towers only, the proposal does not consider chiller energy usage, which accounts for the vast majority of cooling system energy usage. This proposal will encourage the use of larger, more expensive towers with relatively low energy savings when compared to the energy usage of the cooling system. What will keep a system designer from using a lower cost, less efficient chiller to help offset the added cost of the cooling towers installation? Therefore, we recommend that the efficiency rating remain at 42.1gpm/hp, which is currently 5% higher than ASHRAE Standard 90.1. We can consider a nominal increase due to the air-cooled system limitation; however any efficiency increase will reduce flexibility to optimize system efficiency.

2. Cost Premium is Significant and will Increase Cost-of-Living and Cost-of-Doing Business

- a. Per comments during the stakeholder meeting, a 90% increase in efficiency requirements can increase first costs to owners and contractors by more than 25% on galvanized units. Although the proposal's estimates indicate a 15% increase, alternate conditions, particularly for some larger towers, can result in significant premiums in both percentage and dollar terms. As a manufacturer with a plant based on California, we are sensitive to the cost of doing business in California, and this may generate additional discouragement from locating facilities in California. Per my comments during the Stakeholder meeting, cooling tower manufacturers would be very pleased to sell larger, more efficient



equipment, but this will ultimately increase cost-of-living and cost of doing business in California.

- b. The proposal reviewed the premium for galvanized units. However, much of the equipment shipped to California is constructed of stainless steel in order to improve the longevity of the equipment, especially in corrosive coastal environments or in areas of poor water quality. Since the stainless steel cost premium in dollar terms will be much higher per ton (estimated at 50% to 75% more than galvanized steel), this will add significant costs in dollar terms.
- c. Additional installation cost premiums will include additional structural steel for support, and higher enclosure walls. This real cost was neglected in the analysis.
- d. Additional maintenance costs may include maintaining additional drive components (e.g. more motors, belts), cleaning more fill, and cleaning additional basins.
- e. Additional water treatment chemicals will be required for larger basins and additional cells under this proposal.
- f. A small footprint is a very common need due to building space limitations, and requiring a building energy analysis, when required, will be costly.

3. Cost Premium will Place Undue Burden on Cooling Tower and Must be Applied to Other Technologies

- a. Evaporative cooling is already the most efficient cooling solution on the market. If these regulations are imposed on evaporative cooling systems, then similar restrictions should be placed on all technologies to ensure that this does not arbitrarily favor less efficient technologies. Also, per comments above, efficiency of the entire system should be considered and evaluated, not only the cooling towers.
- b. Strengthening the limitation on air cooled chillers by eliminating loopholes and enforcement issues would help to negate some of the issues the Industry has with this onerous increase. Other technologies, such as VRF, should be added to the limitation to help mitigate any market shift from higher efficiency, higher cost water cooled systems to lower cost, less energy efficient cooling systems.

Waterside Economizer

1. The 3degF Approach Requirement Will Increase Tower Size and Cost Premium
 - a. In addition to a higher efficiency rating, the 3degF approach requirement will further increase the size of the cooling tower, raising the cost premium more. Since the industry is currently proposing 60gpm/hp through ASHRAE Standard 90.1 when used with Waterside Economizers, a reduction in approach may further increase the cost burden on the contractor, owner, and tenants.
2. The 3degF Approach Requirement is Impractical Due to Level of Accuracy Required



- a. CTI certification states a minimum approach of 5degF, due to inaccuracy at levels below this.

Again, we strongly support California's energy-efficiency initiatives, and we were the first cooling tower manufacturer to brand "extremely energy efficient" cooling towers, defined as at least twice the ASHRAE Standard 90.1 minimum efficiency rating, or 80.4 gpm/HP. However, this branding was meant to educate customers and encourage them to consider more energy-efficient units. We believe that mandating this will make California a less competitive state in which to live, work, and do business. Therefore, we propose a more reasonable and incremental efficiency increase, if the state continues to deviate from the ASHRAE Standard 90.1 ratings, which we believe to allow flexibility for the highest system efficiency possible.

Sincerely,

BALTIMORE AIRCOIL COMPANY

Ben S. Cohen
Manager of Product Marketing, North America