

## DOCKETED

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<b>Document Title:</b>	Taylor Engineering Comments on Title 24 2019-NR-ASHRAE90.1-D Proposals Based on ASHRAE 90.1-2016
<b>Description:</b>	Comments on Title 24 2019-NR-ASHRAE90.1-D Proposals Based on ASHRAE 90.1-2016 â€œ Draft Report Waterside Economizers
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*Comment Received From: Steven Taylor*

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**Comments on Title 24 2019-NR-ASHRAE90.1-D Proposals Based on ASHRAE 90.1-2016 – Draft Report Waterside Economizers**

Please see attached

*Additional submitted attachment is included below.*



To: Statewide Codes and Standards Team  
From: Steve Taylor  
Subject: Comments on Title 24 2019-NR-ASHRAE90.1-D  
Proposals Based on ASHRAE 90.1-2016 – Draft Report  
Waterside Economizers  
Date: July 7, 2017

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I oppose the Waterside Economizer proposal in its current form because it is not well researched and technically incorrect. Please consider the following comments:

1. The analysis justifying the increase from 45F outdoor air wetbulb temperature to 49F is in error. It seems to fail to adjust for:
  - a. Cooling tower approach degradation as load and ambient wetbulb temperature decrease.
  - b. Limitations on supply air temperature reset that would allow warmer CHW temperatures to meet the load.

I am a longtime member of SSPC 90.1 and one of the most common complaints we have had over the years is that the current requirement is already too stringent! Please see "Waterside Economizers & 90.1" by Daniel Nall, ASHRAE Journal August 2014. This much more thorough analysis demonstrates the difficulty of meeting the current requirement. The change from 45F wetbulb to 49F wetbulb temperature is not practical and should be rejected.

2. The author of these revisions fails to understand that Title 24 (and Standard 90.1) already require integrated economizer design and have for more than 20 years. The language in 140.4(e)2B requires what is essentially called "integrated" operation. Thus the entire analysis is flawed because the baseline is assumed to be non-integrated, which is incorrect.
  2. If an economizer is required by Section 140.4(e)1 it shall be:
    - A. Designed and equipped with controls so that economizer operation does not increase the building heating energy use during normal operation; and  
**EXCEPTION to Section 140.4(e)2A:** Systems that provide 75 percent of the annual energy used for mechanical heating from site-recovered energy or a site-solar energy source.
    - B. Capable of providing partial cooling even when additional mechanical cooling is required to meet the remainder of the cooling load.



3. The structure of the requirement does not match the ultimate format of 90.1 Addendum du (below) and no rationale was provided the revision.
  2. Chilled-water cooling systems without a fan or that use induced airflow, where the total capacity of these systems is less than 1,000,000 Btu/h (295 kW) in Climate Zones 0, 1b, and 2 through 4; less than 1,400,000 Btu/h (410 kW) in Climate Zones 5 through 8; or any size in Climate Zone 1a.

I am in favor of the gist of the proposed changes relating to waterside economizers and am willing to work with the authors of this proposal to fix the language.