DOCKETED	
Docket Number:	24-BSTD-01
Project Title:	2025 Energy Code Rulemaking
TN #:	256359
Document Title:	CTI Comments on 45-Day Title 24 Language
Description:	N/A
Filer:	System
Organization:	CTI/Paul Lindahl
Submitter Role:	Public
Submission Date:	5/13/2024 6:14:34 PM
Docketed Date:	5/14/2024

Comment Received From: Paul Lindahl
Submitted On: 5/13/2024
Docket Number: 24-BSTD-01

CTI Comments on 45-Day Title 24 Language

Document atttached - converted to searchable.

Additional submitted attachment is included below.

COOLING TECHNOLOGY INSTITUTE

PO Box 681807, Houston, TX 77268 / 3845 Cypress Creek Parkway, #420, / Houston, TX 77068
Phone: 281.583.4087 / Fax: 281.537.1721 / email: vmanser@cti.org / http://www.cti.org

May 13, 2024

To: CEC Docket 24-BSTD-01
(https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-BSTD-01)

Dear CEC Staff:

Thank you for the opportunity to provide comments on the 45-Day Title 24 language related to cooling towers informed by both the 2025 Staff Supplement to the 2025 Case Report on Cooling Towers issued March 28, 2024, and the CA Utility CASE Team and Compliance Improvement Team Comment on 45-Day Express Terms dated May 3, 2024. The Cooling Technology Institute (CTI) continues to understand and support the California Energy Commission's goals to improve building energy efficiency and reduce overall water use, while also decreasing carbon emissions. As per our Mission statement, the CTI supports all environmentally friendly, sustainable heat rejection technologies including evaporative heat rejection which continues to be one of the most energy efficient cooling methods available.

The Cooling Technology Institute (www.CTI.org), based in Houston, Texas, is an independent, not-for-profit organization dedicated to advocating and promoting, for the benefit of the public, the use of all environmentally responsible and energy efficient cooling technologies, such as wet cooling towers, air-cooled condensers, dry coolers, adiabatic coolers and condensers, indirect cooling, and hybrid wet/dry systems by encouraging education, research and development, independent performance verification and certification programs, the exchange of technical information and technology and dialog with government agencies and organizations. The CTI has a broad based, global membership of individuals and organizations interested in environmentally responsible heat transfer systems, including owner/operators, manufacturers and suppliers to the industry.

We thank the CEC Staff for responding to Industry feedback on the Final Case Report on Cooling Towers and recognize the changes that were made to accommodate our input. Based on the 45-Day Language and the Supplemental Case Report, we would like to provide the following additional input on the two measures relative to cooling towers:

Cooling Tower Minimum Efficiency

The CTI appreciates the reduction in the minimum efficiency of axial fan open circuit cooling towers used on chiller plants over 300 tons from a level of 90 gpm/hp to a maximum of 80 gpm/hp in the 45-Day Language. This change will definitely help to minimize potential negative consequences as detailed in our previous letter of September 5, 2023, including intended market shifts to less energy efficient cooling technologies, increased cooling system costs, potential market shifts to less efficient cooling systems, and difficulty in applying these larger, heavier cells per manufacturer's guidelines on many sites.

Because of the issues recently identified with the proper control of cooling tower fan speed (and hence energy) per code requirements in many energy modeling programs, the CTI suggests that further study be undertaken on this subject in the future once these issues have been corrected. As we are sure you are aware, the vast majority of cooling towers utilize variable speed fan control which significantly reduces the annual fan energy usage, and we believe this is not properly reflected in the energy models. Additionally, the modelling programs appear not able to model staging of multiple cell cooling tower installations per ASHRAE Standard 90.1. This also has a significant impact on energy efficiency on an annual basis. Further, there are relatively few single cooling tower cell installations over 300 tons, making the lack of staging in the single cell modelling that was performed even more in error as compared to actual installations.

We also request that the minimum efficiency for all Climate Zones be checked for proportionality as some have increased from the values shown in the First Draft of the Case Study. No justification has been offered in the subsequent reports for these increases.

Cooling Tower Blowdown Controls

As stated in our previous comments, the CTI believes in the "wise use of the world's water resources." As part of this, the minimization of blowdown is a key goal of our water treatment members, while keeping scale, fouling, corrosion and microbial growth under control. Increasing cycles of concentration and reducing blowdown must be done carefully to avoid negative, unintended consequences which can detrimentally impact the performance and energy efficiency of not just the evaporative heat rejection unit, but the entire cooling system.

We offer the following comments on this section:

1. The CTI agrees with the change to the metric for conductivity, micro-siemens/cm.
2. Additionally, we suggest the following changes for clarity (our markup of the language in underline and strikethrough in red):

110.2 (e) 2. ...

The maximum cycles of concentrations are based on the local water supply quality as reported by the local water supplier, and shall be the minimum of:
A. 2970 divided by the conductivity of the entering make-up water in micro-siemens/cm
B. 1845 divided by the total dissolved solids of the entering make-up water in ppm
C. 540 divided by the M-alkalinity excluding galvanized steel of the entering make-up water in ppm
D. 450 divided by the M-alkalinity including galvanized steel of the entering make-up water in ppm
E. 540 divided by the calcium hardness of the entering make-up water in ppm
F. 270 divided by the chlorides of the entering make-up water in ppm
G. 225 divided by the sulfates of the entering make-up water in ppm
H. 135 divided by the silica of the entering make-up water in ppm
I. LSI ~~10^((-1/2.038895)*(Log(M-alkalinity excluding galvanized steel of the entering make-up water *0.9*1.219)-0.061105*Log(calcium hardness of the entering make-up water *M-alkalinity excluding galvanized steel of the entering make-up water)+0.0050325*max skin temp-5.95)~~

Defining the units of measure for each parameter will add clarity. We also suggest replacing "I" with LSI as this parameter, as shown, is confusing and likely not a proper way to establish cycles of concentration. We also would be supportive of the recommendations by the CA Utility CASE Team and Compliance Improvement Team to delete this specific section in favor of relying on the values in Table 110.2-A-1 for determining the maximum achievable cycles of concentration which simplifies the language and would improve compliance in our opinion.

3. For a cooling tower, there will be a limiting parameter that defines the need to initiate blowdown. In a conductivity-controlled system, the conductivity is set to maintain that controlling parameter such as TDS or chlorides. This setting may be less than the value of conductivity shown in Table 110.2-A-1. We suggest that a note to this effect be added to the Table to avoid confusion when the required conductivity setting is lower than the maximum conductivity value shown in the Table.
4. Revise Appendix 1-A as follows:

COOLING TECHNOLOGY INSTITUTE
CTI ATC-105(22) Acceptance Test Code for Cooling Towers
CTI ATC-105DS (18) Acceptance Test Code for Dry Fluid Coolers
CTI ATC-105S (11) Acceptance Test Code for Closed-Circuit Cooling Towers
CTI ATC-106 (11) Acceptance Test Code for Mechanical Draft Evaporative Vapor Condensers
CTI STD-201-RS (21) Standard for the Certification of Water-Cooling Tower Thermal Performance

Available from:

Cooling Technology Institute
3845 Cypress Creek Parkway, Suite 420
Houston, Texas 77068
PO Box 681807

Houston, TX 77268
(281) 583-4087

Summary

The CTI appreciates the opportunity to provide further input to the CEC and will continue to monitor the 2025 Development Process closely through publication. Our members would be happy to assist with additional input to the CEC Staff, as well as answer any specific questions that may arise relative to our comments or cooling towers in general.

Please feel free to contact me at any time.

Sincerely,

James Baker, President
Cooling Technology Institute

cc: Ken Mortensen, CTI Past President
CTI Board of Directors
Vicky Manser, CTI Administrator
CTI Regulatory Response Committee, Paul Lindahl, Chair
Haile Bucaneg (Haile.Bucaneg@energy.ca.gov)