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Air-Conditioning, Heating, and Refrigeration Institute

August 31, 2011

California Energy Commission
Dockets Office, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Docket No. 10-BSTD-01

To Whom it may Concern,

These comments are submitted by the Air-Conditioning, Heating and Refrigeration Institute (AHRI) in response to the information presented at the August 17, 2011 Staff Workshop on Draft Revisions for Nonresidential Buildings for Possible Inclusion in the 2013 Building Energy Efficiency Standards. In particular, we are addressing the Draft Measure Information Template – Commercial Boilers and associated draft revisions to Title 24.

The proposed changes to Title 24 regarding the commercial boilers are inappropriate and the analysis done for this proposed measures has significant flaws. We recommend that none of the proposed "commercial boiler" measures be included in the proposed 2013 edition of the Title 24. The energy savings have been overestimated and the costs underestimated.

The Draft Measure Information Template for Commercial Boilers was extrapolated from the template developed for process boilers. The following are major differences that indicate that such an extrapolation is not appropriate.

Process Boilers currently are not covered by either federal efficiency regulations or CEC Title 20 appliance efficiency regulations. Commercial boilers have been subject to efficiency regulations for at least the past 20 years. Thus these two products have different baselines for measuring the benefits of efficiency improvement measures.

Process boilers are significantly different in design and function compared to commercial boilers. The operating parameters (e.g. outlet and return water temperatures) and the load of a process heater are determined by the specific application. For commercial boilers these values are defined by either the applicable test procedures or heating load calculations based on climatic conditions. Similarly, the range of inputs for typical process boilers is very different than the range of inputs for commercial boilers.

The California Title 24 requirements include requirements covering the hydronic heating system or the service hot water distribution system which improve the efficiency of the system, subsequently reducing the consumption of the boiler. There are no corresponding efficiency regulations for the system that is connected to the process boiler.

The emission regulations applicable to commercial boilers in various Air Quality Management Districts in California have a secondary effect of promoting designs that better control the combustion process. This is not the case with process boilers which use pollution control devices to comply with emission regulations.

There are more stringent federal minimum efficiency standards for commercial boilers that become effective on March 2, 2012 (A copy of these new minimum efficiency requirements is attached). The template for commercial boilers does not address, let alone, acknowledge the effect of these increased efficiency requirements. As noted, there are no existing or pending federal efficiency requirements for process boilers.

The cumulative effect of these differences is to render the commercial boiler analysis invalid.

In addition, the analysis and proposed revisions have the following errors:

Flue Damper

The analysis identifies this as beneficial only for natural draft boilers yet the proposal presented at the webinar applies it to both natural and forced draft boilers.

The flue damper must be open when the burner is firing so it provides no benefit in this mode of operation. The assumed 2% energy savings benefit is based on the typical difference between the combustion efficiency and thermal efficiency when the burner is on. The 2722 hours of operation in the analysis includes the times when the burner is on. There is no energy benefit from the flue damper during those hours. If figure 17 is correct, the benefit is overestimated by almost a factor of 2. The standby loss when the burner is off is only some percentage of the energy contained in the boiler during periods when the burner is off. This value will depend on the particular design but it is significantly less than 2% of the boiler's input.

The provision addressing two or more boilers connected to the same stack has not been analyzed relative to the common control strategies that are employed on modular boiler systems or the

practice for certain commercial installations to have a back-up boiler that is only operated sporadically.

The analysis has not considered the actual installations variations of commercial boilers. Is the boiler in the conditioned space, is it outdoors, or is it in a separate boiler room that has a dedicated supply of combustion air. Each of those circumstances presents a different situation as to the benefit of reduced "standby" loss.

Fan VFD

The combustion air fan is an integral part of the burner control system of a boiler. The operation of this fan affects the efficiency of the burner and completeness of the combustion process. This component approach to energy savings does not recognize the overall effect of the fan on the safe and efficient operation of the boiler. A similar proposal was rejected by the ASHRAE 90.1 Standing Standards project Committee because the proposal was a design restriction of a component of a product for which minimum efficiency requirements are specified. Fans that are part of burner/boiler assemblies serve the purpose of mixing the fuel and air to provide a combustible mixture. If the burner/boiler assembly is designed to operate at more than one firing rate, the fan also helps provide safe combustion and efficient operation at those other firing rates. As a component of the burner/boiler assembly, the performance of the fan is effectively addressed by the minimum efficiency requirements specified for commercial boilers as well as the safety requirements and other regulations that limit emissions from the combustions process.

The analysis of boiler run-times is not adequately explained to evaluate its accuracy.

The analysis does not consider current designs of boilers that employ multi-speed conventional combustion fan motors.

Parallel Position Control

Figure 16 is based on a 1991 book on the control of boilers. Boiler control strategies have evolved to such a degree in the past 20 years that this figure showing the relationship of combustion efficiency and excess air should be updated to reflect current boiler designs.

This analysis starts from a baseline of a boiler whose efficiency is unregulated. While true for process boilers, it does not apply to commercial boilers. The benefit of this measure for commercial boilers must be analyzed in terms of the current efficiencies and corresponding excess air levels of commercial boilers. It must also assess the influence of California emission regulations.

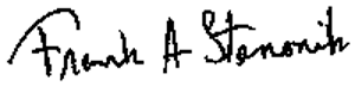
The use of parallel positioning controls on commercial boilers is not a common practice. Accordingly, the cost estimates to implement this measure should be further scrutinized, particularly the maintenance costs.

The statement that parallel positioning control is standard with low and ultra-low NOx burners may be true for process boilers, but we are not aware of its widespread use in commercial boilers complying with NOx emission regulations in California.

The attempt to develop commercial boiler measures based on the process boiler analysis is incomplete and inadequate. The measures that were presented at the August 17 workshop should not be considered further in this process to develop the 2013 edition of Title 24.

We appreciate this opportunity to submit comments. If you have any questions or require additional information, please contact us.

Respectfully submitted,



Frank A. Stanonik
Chief Technical Advisor

Attachment

regulatory actions. The purpose of the bulletin is to enhance the quality and credibility of the Government's scientific information. Under the Bulletin, the energy conservation standards rulemakings analyses are ''influential scientific information.'' The Bulletin defines ''influential scientific information'' as ''scientific information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions.'' 70 FR 2664, 2667 (Jan. 14, 2005).

In response to OMB's Bulletin, DOE conducted formal peer reviews of the energy conservation standards development process and analyses, and then prepared a Peer Review Report pertaining to the energy conservation standards rulemaking analyses. Generation of this report involved a rigorous, formal, and documented evaluation process using objective criteria and qualified and independent reviewers to make a judgment as to the technical/scientific/business merit, the actual or anticipated results, and the productivity and management effectiveness of programs and/or projects. The ''Energy Conservation Standards Rulemaking Peer Review Report,'' dated February 2007, has been disseminated and is available at *http://www.eere.energy.gov/buildings/appliance_standards/peer_review.html.*

N. Congressional Notification

As required by 5 U.S.C. 801, DOE will submit to Congress a report regarding the issuance of today's final rule prior to the effective date set forth at the outset of this notice. The report will state that it has been determined that the rule is a ''major rule'' as defined by 5 U.S.C. 804(2). DOE also will submit the supporting analyses to the Comptroller General in the U.S. Government Accountability Office (GAO) and make them available to Congress.

VIII. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this final rule.

List of Subjects in 10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation, Incorporation by reference, and Reporting and recordkeeping requirements.

Issued in Washington, DC, on July 8, 2009.

Cathy Zoi,

Assistant Secretary, Energy Efficiency and Renewable Energy.

■ For the reasons set forth in the preamble, DOE is amending Chapter II of Title 10, Code of Federal Regulations, Part 431 to read as set forth below:

PART 431—ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

■ 1. The authority citation for part 431 continues to read as follows:

Authority: 42 U.S.C. 6291–6317.

■ 2. In § 431.82, revise the definition ''combustion efficiency'' and add definitions for ''Btu/h or Btu/hr'' and ''thermal efficiency,'' in alphabetical order to read as follows:

§ 431.82 Definitions concerning commercial packaged boilers.

* * * * *

Btu/h or *Btu/hr* means British thermal units per hour.

Combustion efficiency for a commercial packaged boiler is determined using test procedures prescribed under § 431.86 and is equal to 100 percent minus percent flue loss (percent flue loss is based on input fuel energy).

* * * * *

Thermal efficiency for a commercial packaged boiler is determined using test procedures prescribed under § 431.86 and is the ratio of the heat absorbed by the water or the water and steam to the higher heating value in the fuel burned.

■ 3. Revise § 431.85 to read as follows:

§ 431.85 Materials incorporated by reference.

(a) *General.* We incorporate by reference the following standards into Subpart E of Part 431. The material listed has been approved for incorporation by reference by the Director of the **Federal Register** in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE regulations unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the **Federal Register**. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* Also, this material is available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, 202–586–2945, or go to: *http://www1.eere.energy.gov/buildings/appliance_standards/.* Standards can be obtained from the sources listed below.

(b) *HI.* The Gas Appliance Manufacturers Association (GAMA) merged in 2008 with the Air-Conditioning and Refrigeration Institute to become the Air-Conditioning, Heating, and Refrigeration Institute (AHRI). The Hydronics Institute BTS–2000 Testing Standard can be obtained from AHRI. For information on how to obtain this material, contact the Hydronics Institute Section of AHRI, P.O. Box 218, Berkeley Heights, NJ 07922–0218, (866) 408–3831, or go to: *http://www.ahrinet.org/Content/OrderaStandard_573.aspx.*

(1) The Hydronics Institute Division of GAMA BTS–2000 Testing Standard, (''HI BTS–2000, Rev 06.07''), *Method to Determine Efficiency of Commercial Space Heating Boilers,* Second Edition (Rev 06.07), 2007, IBR approved for § 431.86.

(2) [Reserved].

■ 4. Revise § 431.86, to read as follows:

§ 431.86 Uniform test method for the measurement of energy efficiency of commercial packaged boilers.

(a) *Scope.* This section provides test procedures that must be followed for measuring, pursuant to EPCA, the steady state combustion efficiency and thermal efficiency of a gas-fired or oil-fired commercial packaged boiler. These test procedures apply to packaged low pressure boilers that have rated input capacities of 300,000 Btu/h or more and are ''commercial packaged boilers,'' but do not apply under EPCA to ''packaged high pressure boilers.''

(b) *Definitions.* For purposes of this section, the Department incorporates by reference the definitions specified in Section 3.0 of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85), with the exception of the definition for the terms ''packaged boiler,'' ''condensing boilers,'' and ''packaged low pressure steam'' and ''hot water boiler.''

(c) *Test Method for Commercial Packaged Boilers—General.* Follow the provisions in this paragraph (c) for all testing of packaged low pressure boilers that are commercial packaged boilers.

(1) *Test Setup*—(i) *Classifications:* If employing boiler classification, you must classify boilers as given in Section 4.0 of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85).

(ii) *Requirements:* (A) Before March 2, 2012, conduct the combustion efficiency test as given in Section 5.2 (Combustion Efficiency Test) of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85) for all commercial packaged boiler equipment classes.

(B) On or after March 2, 2012, conduct the thermal efficiency test as given in Section 5.1 (Thermal Efficiency Test) of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85) for the following commercial packaged boiler equipment classes: Small, gas, hot water; small, gas, steam, all except natural draft; small, gas, steam, natural draft; small, oil, hot water; small, oil, steam; large, gas, steam, all except natural draft; large, gas, steam, natural draft; and large, oil, steam. On or after March 2, 2012, conduct the combustion efficiency test as given in Section 5.2 (Combustion Efficiency Test) of the HI BTS–2000, Rev 06.07 for the following commercial packaged boiler equipment classes: Large, gas-fired, hot water and large, oil-fired, hot water.

(iii) *Instruments and Apparatus:* (A) Follow the requirements for instruments and apparatus in sections 6 (Instruments) and 7 (Apparatus), of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85), with the exception of section 7.2.5 (flue connection for outdoor boilers) which is replaced with paragraph (c)(1)(iii)(B) of this section:

(B) *Flue Connection for Outdoor Boilers:* Consistent with the procedure specified in section 7.2.1 of HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85), the integral venting used in oil-fired and power gas outdoor boilers may be modified only to the extent necessary to permit the boiler's connection to the test flue apparatus for testing.

(iv) *Test Conditions:* Use test conditions from Section 8.0 (excluding 8.6.2) of HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85) for combustion efficiency testing. Use all of the test conditions from Section 8.0 of HI BTS–2000, Rev 06.07 for thermal efficiency testing.

(2) *Test Measurements*—(i) *Non-Condensing Boilers:* (A) *Combustion Efficiency.* Measure for combustion efficiency according to sections 9.1 (excluding sections 9.1.1.2.3 and 9.1.2.2.3), 9.2 and 10.2 of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85).

(B) *Thermal Efficiency.* Measure for thermal efficiency according to sections 9.1 and 10.1 of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85).

(ii) *Procedure for the Measurement of Condensate for a Condensing Boiler.* For the combustion efficiency test, collect flue condensate as specified in Section 9.2.2 of HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85). Measure the condensate from the flue gas under steady state operation for the 30 minute collection period during the 30 minute steady state combustion efficiency test. Flue condensate mass shall be measured immediately at the end of the 30 minute collection period to prevent evaporation loss from the sample. The humidity of the room shall at no time exceed 80 percent. Determine the mass of flue condensate for the steady state period by subtracting the tare container weight from the total container and flue condensate weight measured at the end of the test period. For the thermal efficiency test, collect and measure the condensate from the flue gas as specified in Section 9.1.1 and 9.1.2 of HI BTS–2000, Rev 06.07.

(iii) *A Boiler That is Capable of Supplying Either Steam or Hot Water*—(A) *Testing.* For purposes of EPCA, before March 2, 2012, measure the combustion efficiency of any size commercial packaged boiler capable of supplying either steam or hot water either by testing the boiler in the steam mode or by testing it in both the steam and hot water modes. On or after March 2, 2012, measure the combustion efficiency and thermal efficiency of a large (fuel input greater than 2,500 kBtu/h) commercial packaged boiler capable of supplying either steam or hot water either by testing the boiler for both efficiencies in steam mode, or by testing the boiler in both steam and hot water modes measuring the thermal efficiency of the boiler in steam mode and the combustion efficiency of the boiler in hot water mode. Measure only the thermal efficiency of a small (fuel input of greater than or equal to 300 kBtu/h and less than or equal to 2,500 kBtu/h) commercial packaged boiler capable of supplying either steam or hot water either by testing the boiler for thermal efficiency only in steam mode or by testing the boiler for thermal efficiency in both steam and hot water modes.

(B) *Rating.* If testing a large boiler only in the steam mode, use the efficiencies determined from such testing to rate the thermal efficiency for the steam mode and the combustion efficiency for the hot water mode. If testing a large boiler in both modes, rate the boiler's efficiency for each mode based on the testing in that mode. If testing a small boiler only in the steam mode, use the efficiencies determined from such testing to rate the thermal efficiency for the steam mode and the hot water mode. If testing a small boiler in both modes, rate the boiler's efficiency for each mode based on the testing in that mode.

(3) *Calculation of Efficiency*—(i) *Combustion Efficiency.* Use the calculation procedure for the combustion efficiency test specified in Section 11.2 (including the specified subsections of 11.1) of the HI BTS–2000, Rev 06.07 (incorporated by reference, *see* § 431.85).

(ii) *Thermal Efficiency.* Use the calculation procedure for the thermal efficiency test specified in Section 11.1 of the HI BTS–2000, Rev 06.07 (incorporated by reference, *see* § 431.85).

■ 5. Revise § 431.87 to read as follows:

§ 431.87 Energy conservation standards and their effective dates.

(a) Each commercial packaged boiler manufactured on or after January 1, 1994, and before March 2, 2012, must meet the following energy efficiency standard levels:

(1) For a gas-fired packaged boiler with a capacity (rated maximum input) of 300,000 Btu/h or more, the combustion efficiency at the maximum rated capacity must be not less than 80 percent.

(2) For an oil-fired packaged boiler with a capacity (rated maximum input) of 300,000 Btu/h or more, the combustion efficiency at the maximum rated capacity must be not less than 83 percent.

(b) Each commercial packaged boiler listed in Table 1 to § 431.87 and manufactured on or after the effective date listed in Table 1 of this section, must meet the applicable energy conservation standard in Table 1.

TABLE 1 TO § 431.87—COMMERCIAL PACKAGED BOILER ENERGY CONSERVATION STANDARDS

Equipment type	Subcategory	Size category (input)	Efficiency level—Effective date: March 2, 2012 *
Hot Water Commercial Packaged Boilers.	Gas-fired	≥300,000 Btu/h and ≤2,500,000 Btu/h	80.0% E_T
Hot Water Commercial Packaged Boilers.	Gas-fired	>2,500,000 Btu/h	82.0% E_C
Hot Water Commercial Packaged Boilers.	Oil-fired	≥300,000 Btu/h and ≤2,500,000 Btu/h	82.0% E_T
Hot Water Commercial Packaged Boilers.	Oil-fired	>2,500,000 Btu/h	84.0% E_C
Steam Commercial Packaged Boilers	Gas-fired—all, except natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h	79.0% E_T
Steam Commercial Packaged Boilers	Gas-fired—all, except natural draft	>2,500,000 Btu/h	79.0% E_T
Steam Commercial Packaged Boilers	Gas-fired—natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h	77.0% E_T
Steam Commercial Packaged Boilers	Gas-fired—natural draft	>2,500,000 Btu/h	77.0% E_T
Steam Commercial Packaged Boilers	Oil-fired	≥300,000 Btu/h and ≤2,500,000 Btu/h	81.0% E_T
Steam Commercial Packaged Boilers	Oil-fired	>2,500,000 Btu/h	81.0% E_T

* Where E_C is combustion efficiency and E_T is thermal efficiency as defined in § 431.82.

(c) Each commercial packaged boiler listed in Table 2 to § 431.87 and manufactured on or after the effective date listed in Table 2 of this section, must meet the applicable energy conservation standard in Table 2.

TABLE 2 TO § 431.87—COMMERCIAL PACKAGED BOILER ENERGY CONSERVATION STANDARDS

Equipment type	Subcategory	Size category (input)	Efficiency level—Effective date: March 2, 2022 *
Steam Commercial Packaged Boilers	Gas-fired—natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h	79.0% E_T
Steam Commercial Packaged Boilers	Gas-fired—natural draft	>2,500,000 Btu/h	79.0% E_T

* Where E_C is combustion efficiency and E_T is thermal efficiency as defined in § 431.82.

■ 6. Add a new paragraph (d) to § 431.97 to read as follows:

§ 431.97 Energy efficiency standards and their effective dates.

* * * * *

(d) Each water-cooled and evaporatively-cooled commercial package air conditioning and heating equipment with a cooling capacity at or above 240,000 Btu/h and less than 760,000 Btu/h manufactured on or after January 10, 2011, shall meet the following standard levels:

(1) For equipment that utilizes electric resistance heat or without heating, the energy efficiency ratio must be not less than 11.0.

(2) For equipment that utilizes all other types of heating, the energy efficiency ratio must be not less than 10.8.

Note: The following appendix will not appear in the Code of Federal Regulations.

Department of Justice, Antitrust Division, Christine A. Varney, Assistant Attorney General, Main Justice Building, 950 Pennsylvania Avenue, NW., Washington, DC 20530–0001, (202) 514–2401/(202) 616–2645(f), *antitrust.atr@usdoj.gov*, *http://www.usdoj.gov/atr.*

May 8, 2009.

Eric J. Fygi, Acting General Counsel, Department of Energy, Washington, DC 20585.

Dear Acting General Counsel Fygi: I am responding to your March 30, 2009 letter seeking the views of the Attorney General about the potential impact on competition of proposed amended energy conservation standards for commercial packaged boilers and certain commercial packaged air-conditions and heat pumps. Your request was submitted pursuant to Section 325(0)(2)(B)(i)(V) of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6295(0)(2)(B)(i)(V), which requires the Attorney General to make a determination of the impact of any lessening of competition that is likely to result from the imposition of proposed energy conservation standards. The Attorney General's responsibility for responding to requests from other departments about the effect of a program on competition has been delegated to the Assistant Attorney General for the Antitrust Division in 28 CFR 0.40(g).

In conducting its analysis, the Antitrust Division examines whether a proposed standard may lessen competition, for example, by substantially limiting consumer choice leaving consumers with fewer competitive alternatives, placing certain manufacturers of a product at an unjustified competitive disadvantage compared to other manufacturers; or by inducing avoidable inefficiencies in production or distribution of particular products.

We have reviewed the proposed standards and the supplementary information submitted to the Attorney General, and attended the April 7, 2009 public hearing on the proposed standards.

We have concluded that the proposed standards are not likely to have an adverse effect on competition. In reaching this conclusion, we note the absence of any competitive concerns raised by industry participants at the hearing. Indeed, the efficiency levels in the proposed standards are based on a consensus recommendation submitted by efficiency advocacy groups and the trade association for manufacturers of commercial packaged boilers. Based on these facts, we believe the new standard would not likely reduce competition.

Sincerely,

Christine A. Varney,
Assistant Attorney General.

[FR Doc. E9–16774 Filed 7–21–09; 8:45 am]

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