[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Part 430

[Docket No. EERE-2013-BT-TP-0008]

RIN: 1904-AC96

Energy Conservation Program for Consumer Products: Test Procedures for Residential Furnaces and Boilers

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice of proposed rulemaking and announcement of public meeting.

SUMMARY: The U.S. Department of Energy (DOE) proposes to revise its test procedure for residential furnaces and boilers established under the Energy Policy and Conservation Act. This rulemaking would adopt needed equations, applicable to certain classes of these products, which were omitted from the relevant industry standard incorporated by reference in the DOE test procedure. Specifically, the current DOE test procedure for residential furnaces and boilers incorporates by reference the American National Standards Institute (ANSI)/American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) Standard 103-1993, Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers, (ASHRAE 103-1993). Section 9.10 of ASHRAE 103-1993, and by extension the DOE test procedure, permits condensing furnaces and boilers the option of omitting the specified heat-up and cool-down tests, if the model: (1) has no measurable airflow through the combustion chamber and heat exchanger during the burner off period; and (2) has post-purge period(s) of

less than 5 seconds. However, the current test method lacks an equation necessary for the calculation of the heating seasonal efficiency (which contributes to the ultimate calculation of annual fuel utilization efficiency (AFUE)) of two-stage and modulating condensing furnaces or boilers when the option in section 9.10 is employed. The proposed revision to the DOE test procedure would rectify this error by adopting additional equations for the calculation of the part-load efficiencies at the maximum input rate and reduced input rates for two-stage and modulating condensing furnaces and boilers, when the manufacturer chooses to omit the heat-up and cool-down tests under section 9.10.

DATES: Meeting: DOE will hold a public meeting on Wednesday, March 13, 2013, from 9:00 a.m. to 12:00 p.m., in Washington, DC. The meeting will also be broadcast as a webinar. See section V, "Public Participation," for webinar registration information, participant instructions, and information about the capabilities available to webinar participants.

Comments: DOE will accept comments, data, and information regarding this notice of proposed rulemaking (NOPR) before and after the public meeting, but no later than **[INSERT DATE 75 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. See section V, "Public Participation," for details.

ADDRESSES: The public meeting will be held at the U.S. Department of Energy, Forrestal Building, Room 8E-089, 1000 Independence Avenue, SW., Washington, DC 20585. To attend, please notify Ms. Brenda Edwards at (202) 586–2945. Please note that foreign nationals visiting DOE Headquarters are subject to advance security screening procedures. Any foreign national wishing to participate in the meeting should advise DOE as soon as possible by contacting Ms.

Edwards at the phone number above to initiate the necessary procedures. Please also note that any person wishing to bring a laptop computer into the Forrestal Building will be required to obtain a property pass. Visitors should avoid bringing laptops, or allow an extra 45 minutes. Persons may also attend the public meeting via webinar. For more information, refer to section V, "Public Participation," section near the end of this notice.

Interested parties are encouraged to submit comments using the Federal eRulemaking Portal at www.regulations.gov. Follow the instructions for submitting comments. Alternatively, interested parties may submit comments, identified by docket number EERE-2013–BT–TP–0008 and/or regulatory information number (RIN) number 1904-AC96, by any of the following methods:

- E-mail: ResFurnBoilers2013TP0008@ee.doe.gov Include the docket number EERE-2013-BT-TP-0008 and/or RIN 1904-AC96 in the subject line of the message. Submit electronic comments in WordPerfect, Microsoft Word, PDF, or ASCII file format, and avoid the use of special characters or any form of encryption.
- Postal Mail: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE-2J, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. If possible, please submit all items on a compact disc (CD), in which case it is not necessary to include printed copies.
- Hand Delivery/Courier: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC, 20024. Telephone: (202) 586-2945. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

Instructions: All submissions received must include the agency name and docket number and/or RIN for this rulemaking. No telefacsimilies (faxes) will be accepted. For detailed instructions on submitting comments and additional information on the rulemaking process, see section V of this document (Public Participation).

Docket: The docket is available for review at www.regulations.gov, including Federal Register notices, public meeting attendee lists and transcripts, comments, and other supporting documents/materials. All documents in the docket are listed in the www.regulations.gov index. However, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

A link to the docket web page can be found at: http://www.regulations.gov/#!docketDetail;D=EERE-2013-BT-TP-0008. This web page contains a link to the docket for this notice on the www.regulations.gov site. The www.regulations.gov web page contains simple instructions on how to access all documents, including public comments, in the docket. See section V, "Public Participation," for information on how to submit comments through www.regulations.gov.

For further information on how to submit a comment, review other public comments and the docket, or participate in the public meeting, contact Ms. Brenda Edwards at (202) 586-2945 or by email: Brenda.Edwards@ee.doe.gov.

FOR FURTHER INFORMATION CONTACT: Ms. Ashley Armstrong, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, EE-2J, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-6590. E-mail: Ashley.Armstrong@ee.doe.gov.

Mr. Eric Stas, U.S. Department of Energy, Office of the General Counsel, GC-71, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-9507. E-mail: Eric.Stas@hq.doe.gov.

For information on how to submit or review public comments, contact Ms. Brenda Edwards, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, EE-2J, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 586-2945. Email: Brenda.Edwards@ee.doe.gov.

SUPPLEMENTARY INFORMATION:

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I. Authority and Background

Title III, Part B[1] of the Energy Policy and Conservation Act of 1975 ("EPCA" or "the Act"), Pub. L. 94-163 (42 U.S.C. 6291-6309, as codified) sets forth a variety of provisions designed to improve energy efficiency and established the Energy Conservation Program for

[1] For editorial reasons, upon codification in the U.S. Code, Part B was redesignated Part A.

Consumer Products Other Than Automobiles.[2] These include residential furnaces and boilers, the subject of today's notice. (42 U.S.C. 6292(a)(5))[3]

Under EPCA, this program consists essentially of four parts: (1) testing; (2) labeling; (3) Federal energy conservation standards; and (4) certification and enforcement procedures. The testing requirements consist of test procedures that manufacturers of covered products must use as the basis for: (1) certifying to DOE that their products comply with the applicable energy conservation standards adopted pursuant to EPCA, and (2) making representations about the efficiency of those products. (42 U.S.C. 6293(c); 42 U.S.C. 6295(s)) Similarly, DOE must use these test requirements when determining whether the products comply with any relevant standards promulgated under EPCA. (42 U.S.C. 6295(s))

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures that DOE must follow when prescribing or amending test procedures for covered products. EPCA provides, in relevant part, that any test procedures prescribed or amended under this section must be reasonably designed to produce test results which measure energy efficiency, energy use, or estimated annual operating cost of a covered product during a representative average use cycle or period of use, and must not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

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[2] All references to EPCA in this document refer to the statute as amended through the American Energy Manufacturing Technical Corrections Act (AEMTCA), Pub. L. 112-210 (Dec. 18, 2012).

[3] Under 42 U.S.C. 6292(a)(5), the statute establishes "furnaces" as covered products. Originally, boilers were considered a class of furnaces. However, amendments to EPCA in the Energy Independence and Security Act of 2007 (EISA 2007), Pub. L. 110-140 (Dec. 19, 2007), distinguished between furnaces and boilers in 42 U.S.C. 6295(f) by adding the text "and boilers" to the title of that section and by prescribing standards for boiler products. Although EISA 2007 did not similarly update 42 U.S.C. 6292(a)(5), it is implicit that this coverage continues to include boilers.

In addition, if DOE determines that a test procedure amendment is warranted, it must publish proposed test procedures and offer the public an opportunity to present oral and written comments on them. (42 U.S.C. 6293(b)(2)) Finally, DOE has tentatively concluded that any test procedure changes arising from this rulemaking would not impact existing energy conservation standards for residential furnaces and boilers, because such changes would simply allow for the generation of accurate information reflecting the energy efficiency of affected basic models, which are typically comfortably above the existing minimum standard level.

DOE's current energy conservation standards for residential furnaces and boilers are expressed as minimum AFUE. AFUE is an annualized fuel efficiency metric that fully accounts for fuel consumption in active, standby, and off modes. The existing DOE test procedure for determining the AFUE of residential furnaces and boilers is located at 10 CFR part 430, subpart B, Appendix N, Uniform Test Method for Measuring the Energy Consumption of Furnaces and Boilers. The current DOE test procedure for residential furnaces and boilers was originally established by a final rule published in the Federal Register on May 12, 1997, and it incorporates by reference ANSI/ASHRAE Standard 103-1993, Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers (ASHRAE 103-1993). 62 FR 26140, 26157 (incorporated by reference at 10 CFR 430.3(f)(9)). On October 14, 1997, DOE published an interim final rule in the Federal Register to revise a provision concerning the insulation of the flue collector box in order to ensure the updated test procedure would not affect the measured AFUE of existing furnaces and boilers. (62 FR 53508.) This interim final rule was subsequently adopted without change in a final rule published in the Federal Register on February 24, 1998. 63 FR 9390.

On October 20, 2010, DOE amended its test procedure for furnaces and boilers to establish a method for measuring the electrical energy use in standby mode and off mode for gas and oil-fired furnaces and boilers pursuant to requirements established by EISA 2007. 75 FR 64621. These test procedure amendments were primarily based on and incorporated by reference provisions of the International Electrotechnical Commission (IEC) Standard 62301 (First Edition), ''Household electrical appliances—Measurement of standby power." On December 31, 2012, DOE published a final rule in the Federal Register that updated the incorporation by reference of the standby mode and off mode test procedure provisions to refer to the latest edition of IEC Standard 62301 (Second Edition). 77 FR 76831.

On January 4, 2013, DOE published a request for information (RFI) in the Federal Register that requested comment and information on a variety of issues relating to the residential furnace and boiler AFUE test method. 78 FR 675. Key issues discussed in the RFI include avenues for reducing test burden and the addition of a performance test for automatic means of adjusting water temperature in hot water boilers.

II. Summary of the Notice of Proposed Rulemaking

In this notice of proposed rulemaking (NOPR), DOE proposes to modify the existing DOE testing procedures for residential furnaces and boilers to address an omission in the current test procedure regarding the calculation of AFUE for two-stage and modulating condensing furnaces and boilers that employ the optional procedure to skip the heat-up and cool-down tests, as described in section 9.10 (Optional Test Procedure for Condensing Furnaces and Boilers That

Have No Off-Period Flue Losses) of ASHRAE 103-1993. Section 9.10 of ASHRAE 103-1993, which is incorporated by reference into the DOE test procedure for use at Appendix N to subpart B of 10 CFR part 430, allows certain condensing furnaces and boilers to omit the heat-up and cool-down tests provided that they have no measurable airflow through the combustion chamber and heat exchanger during the burner off-period and have post-purge periods of less than 5 seconds. Specifically, section 9.10 of ASHRAE 103-1993 reads as follows:

> For units designed with no measurable airflow through the combustion chamber and heat exchanger during the burner off-period and having post-purge periods of less than 5 seconds, D_F and D_P may be set equal to 0.05. At the discretion of the one testing, the cool-down and heat-up tests specified in 9.5 and 9.6 may be omitted on such units. In lieu of conducting the cool-down and heat-up tests, the tester may use the losses determined during the steady-state test described in 9.1 when calculating heating seasonal efficiency, $Effy_{HS}$.

For single-stage condensing furnaces and boilers, section 11.3.11.3 of ASHRAE 103-1993 provides two separate equations to calculate the heating seasonal efficiency (which contributes to the ultimate calculation of AFUE). One equation is based on the results of the heat-up and cool-down tests described in sections 9.5 and 9.6 and is to be used if these tests were conducted, and the other equation is based on the results of the steady-state test described in section 9.1 and is to be used if these tests were not conducted and the option in section 9.10 was employed instead. Having two separate equations for this section adequately addresses the difference in the data collected depending on whether the option in section 9.10 is employed. Therefore, for single-stage condensing boilers and furnaces, the necessary equations are already

present for the calculation of AFUE when the optional procedure described in section 9.10 is utilized.

However, for two-stage and modulating condensing furnaces and boilers, there are no corresponding equations provided in ASHRAE 103-1993 to calculate the heating seasonal efficiency if the option in section 9.10 is selected. The only equation provided in the test procedure to calculate the heating seasonal efficiency for two-stage and modulating condensing furnaces and boilers requires values for the part-load efficiencies, which are based on the results of the heat-up and cool-down tests. Therefore, if two-stage and modulating condensing furnaces or boilers were tested and the heat-up and cool-down tests were omitted in accordance with section 9.10, the part-load efficiencies, heating seasonal efficiency, and resulting AFUE would all be erroneous if calculated using the DOE test method. DOE is aware that many boiler manufacturers have utilized the optional section 9.10 provisions for two-stage and modulating condensing boilers, regardless of the fact that no equations exist in section 11.5.11 that would provide for the calculation of the part-load efficiencies for such equipment. In calculating the AFUE, manufacturers have used "0" for the temperatures that would be taken during the heat-up and cool-down tests. Research into this issue conducted by the Air-conditioning, Heating, and Refrigeration Institute (AHRI) revealed that AFUE values calculated for boilers using this approach are inflated from one to four percent above their true values. (AHRI, No. 1 at p. 6)

DOE has considered two options to correct this issue for two-stage and modulating condensing furnaces and boilers, including: (1) suspend the use of the option in section 9.10 and

require heat-up and cool-down tests be performed; and (2) develop or adopt a new set of equations to address the use of the option in section 9.10.

DOE has tentatively determined that the best course of action is to proceed with adopting equations to address the use of the option in section 9.10. Accordingly, DOE is proposing in today's NOPR to amend the test procedure to include equations that would allow for the calculation of the AFUE of two-stage and modulating condensing furnaces and boilers when utilizing the option to skip the heat-up and cool-down tests, as provided under section 9.10 of ASHRAE 103-1993.

In any rulemaking to amend a test procedure, DOE must determine to what extent, if any, the proposed test procedure would alter the measured energy efficiency or measured energy use of any covered product as determined under the existing test procedure. (42 U.S.C. 6293(e)(1)) If DOE determines that the amended test procedure would alter the measured efficiency or measured energy use of a covered product, DOE must amend the applicable energy conservation standard accordingly. (42 U.S.C. 6293(e)(2))

The proposed test procedure amendments include a revised method for calculating the AFUE for two-stage and modulating condensing furnaces and boilers. While this change may lead to a revised AFUE rating for certain residential furnaces or boilers, DOE does not believe that the resulting changes in AFUE would require amending the applicable energy conservation standard or affect compliance with the standard by the models at issue here. As noted, the error applies only to two-stage and modulating condensing models, which test well above the current minimum standards. The current minimum energy conservation standards are based on AFUE

ratings that correspond to non-condensing furnaces and boilers, and those values would not change as a result of today's proposal to remedy the omission of necessary equations pertaining to condensing models. DOE does not foresee that a model that would need to be re-rated using the equation proposed in today's notice would have a resulting AFUE below the minimum required efficiency.

III. Discussion

A. Description of AFUE Inflation Issues Associated with Omitting Cool-Down and Heat-Up Testing for Two-Stage and Modulating Condensing Furnaces and Boilers

Recent investigation by AHRI has demonstrated that the DOE test procedure erroneously omits an equation needed to calculate the AFUE rating of two-stage and modulating condensing furnaces or boilers that utilize an optional procedure allowing the tester to skip the heat-up and cool-down tests. This error carries through to the software commonly used in the heating industry to rate and verify the energy efficiency of residential furnaces and boilers, and, thus, the software produces an erroneously high energy efficiency rating for some types of product under certain conditions. DOE has since independently confirmed these findings.

The Federal test procedure for determining the energy efficiency of residential furnaces and boilers in Appendix N to Subpart B of 10 CFR Part 430 is based largely upon ASHRAE 103-1993, which the DOE test procedure incorporates by reference. A product's energy efficiency rating is expressed in terms of AFUE, which is an estimate of the product's fuel consumption during the heating season when operating under a set of standard conditions.

Energy lost during a product's transient heat-up and cool-down stages and during steady-state operation reduces the product's AFUE rating, which can be no higher than 100 percent.

ASHRAE 103-1993 requires consideration of several sources of energy loss when determining a product's energy efficiency rating. For non-weatherized residential boilers, which DOE requires be rated as indoor units (10 CFR part 430, subpart B, Appendix N, section 10.1 in the definition of $Effy_{HS}$), all energy loss is in the form of heat exhausted from the product's vent system. During the burner's on-cycle, losses consist of residual heat in the flue gases and flue gas condensate. During the burner off-cycle, losses include heat transferred from the product's heat exchanger to any air that moves through the heat exchanger when the combustion air fan is running to purge combustible gases from the boiler and/or naturally due to residual draft in the vent system. If the product draws combustion air from inside the heated space, losses also include the heat contained in the warm room air vented during the on-cycle and off-cycle (i.e., infiltration loss). Since boilers are rated as indoor units, off-cycle infiltration losses can be significant, therefore most mid-efficiency boilers are equipped with vent dampers to minimize the loss of room air in the off cycle. Also, because boiler heat exchangers retain a significant amount of heat in the form of hot water, off-cycle sensible heat losses[4] can be significant.

In contrast to residential boilers, DOE requires that non-weatherized residential furnaces be rated as isolated combustion systems (ICS) (10 CFR 430, subpart B, Appendix N, section 10.1 in the definition of $Effy_{HS}$). This means that furnaces are assumed to draw all combustion air from outside the building. Since no indoor air is used for the combustion process, there is no

[4] "Sensible heat" is heat exchanged by a body or thermodynamic system that is the result of a change of temperature. The term is used in contrast to "latent heat," which is the amount of heat exchanged without change of temperature.

efficiency penalty related to heating the unconditioned air which would infiltrate the house. Moreover, furnace heat exchangers have lower residual thermal mass than boiler heat exchangers, so off-cycle sensible losses are less significant.

Off-cycle infiltration and sensible heat losses are quantified by the heat-up and cool-down tests contained in ASHRAE 103-1993. In these tests, the test engineer measures the temperature and mass flow of the vent gases as the flue gases rise to steady-state temperature and after the burner is turned off. However, the test engineer is allowed to omit the heat-up and cool-down tests for condensing furnaces and boilers that are "units designed with no measurable airflow through the combustion chamber and heat exchanger during the burner off-period and having post-purge periods of less than 5 seconds." (See ASHRAE 103-1993, section 9.10, "Optional Test Procedures for Condensing Furnaces and Boilers That Have No Off-Period Flue Losses.") Since air movement through the heat exchanger in the off-cycle is responsible for any off-cycle AFUE penalties for boilers, when no air can flow through the heat exchanger in the off-cycle, there is no AFUE penalty to be calculated. Thus, ASHRAE 103-1993 reasonably disregards infiltration and sensible heat losses in the off-cycle for condensing products when air cannot flow through the heat exchanger by allowing the manufacturer the option to omit the heat-up and cool-down tests. This reduces the testing burden and would have a negligible effect on a product's AFUE rating.

At the present time, the judgment of whether a unit is designed with no measurable off-cycle airflow typically has been determined at the discretion of the testing engineer and/or the manufacturer who is responsible for testing. DOE plans to investigate objective methods for

determining whether units have no measurable off-cycle airflow in a separate, ongoing test procedure rulemaking for furnaces and boilers.[5] Should the test engineer elect to omit the heat-up and cool-down tests, ASHRAE 103-1993 provides an alternate calculation that omits the results of those tests for single-stage condensing products (section 11.3.11.3). However, the alternate calculation applies only to products having a single firing rate -- there is no counterpart in section 11.5.11 for two-stage and modulating condensing products. Thus, ASHRAE 103-1993 and the Federal test procedure do not provide a method of calculating AFUE for two-stage and modulating condensing products when the heat-up and cool-down tests are omitted, even though the test procedure explicitly provides for such an option. This ambiguity has worked its way into the AFUE calculation software[6] commonly employed by industry in testing and rating residential furnaces and boilers. The software was originally developed by the National Institute of Science and Technology (NIST), before being reprogrammed for use with Microsoft Windows and offered for sale by the Gas Appliance Manufacturers Association (GAMA), which is now AHRI. AHRI is the trade association for manufacturers of heating equipment, and it also administers an industry energy efficiency verification program.

As noted above, when calculating the AFUE of a product for which the heat-up and cool-down tests have been omitted, test engineers have been substituting 0° F for various temperatures ordinarily measured during the omitted tests. For single-stage condensing equipment, these

[5] For more information on the ongoing test procedure rulemaking for residential furnaces and boilers, see: http://www1.eere.energy.gov/buildings/appliance_standards/rulemaking.aspx/ruleid/55

[6] DOE notes that the software voluntarily used by manufacturers to streamline the calculations in Appendix N to Subpart B of Part 430 is not DOE-issued or approved. It is the manufacturer's responsibility to ensure that any software employed to automate the DOE test procedure equations is consistent with the exact methods in the test procedure.

zeros trigger the AFUE calculator to use the correct alternate equation. However, for two-stage and modulating condensing equipment, the AFUE calculator erroneously uses those zeros in the ordinary efficiency calculation as if the heat-up and cool-down tests were actually performed. The calculated results indicate that the boiler seems to be recovering heat during heat-up and cool-down instead of losing it, which inflates its AFUE rating, and according to AHRI, the error results in the over-rating of AFUE in two-stage and modulating condensing products by one to four percent. (AHRI, No. 1 at p. 6) The error applies to any two-stage or modulating condensing product for which the heat-up and cool-down tests have been omitted. Based on assertions from AHRI, such over-rating appears to be common for high-efficiency condensing boilers and no other product type. (AHRI, No. 1 at p. 2)

B. Options to Correct Existing Test Procedure

In considering how to address the omitted calculation for two-stage and modulating condensing furnaces and boilers, DOE considered two potential options: (1) suspending the use of section 9.10 for those models; and (2) developing or adopting a new set of equations to address the use of the option in section 9.10 with those models. Each of these potential options is discussed in detail below.

1. Suspend the Use of Section 9.10 for Two-Stage and Modulating Condensing Furnaces and Boilers

The existing DOE test procedure currently does not provide the necessary equations to accommodate the use of the option in section 9.10 of ASHRAE 103-1993 for two-stage and modulating condensing equipment in the calculations provided in section 11.5.11. If DOE were simply to suspend the use of section 9.10 for two-stage and modulating products, manufacturers

and test engineers would need to conduct heat-up and cool-down tests for all two-stage and modulating furnaces and boilers, both condensing and non-condensing.

DOE considered this option as a straightforward approach that could be implemented quickly, would eliminate confusion, and would resolve this issue. Requiring the heat-up and cool-down tests would also ensure more accurate AFUE ratings than those developed using the optional method in section 9.10. However, this approach would also increase test burden on manufacturers and industry. Not only would this be an issue for manufacturers rating equipment efficiency in the future, but initially, it would require a significant amount of re-rating of existing equipment through additional testing, which could significantly burden test labs. Upon considering these concerns and the potential alternatives discussed later in this section, DOE has tentatively decided not to pursue this option.

2. Develop Additional Equations to Correct Existing Test Procedure

ASHRAE 103-1993 lacks equations for determining heating seasonal efficiency for two-stage and modulating condensing furnace and boiler products when the heat-up and cool-down tests are omitted. For single-stage equipment, when the heat-up and cool-down tests are omitted, an alternate equation is provided in which cyclic sensible and infiltration loss factors are replaced with the steady-state sensible heat loss factor, corrected for outdoor air temperature if applicable. More specifically, in section 11.3.11.3, "Heating Seasonal Efficiency," the alternate equation substitutes the steady-state sensible heat loss adjusted for outdoor air temperature when applicable, in place of the sum of the sensible and infiltration heat losses during the on and off cycles.

If the option in section 9.10 of ASHRAE 103-1993 is not employed:

$$Effy_{HS} = 100 - L_{L,A} + L_G - L_C - C_J L_J - \frac{t_{ON}}{t_{ON} + \frac{Q_P}{Q_{IN}}\ t_{OFF}}\ (L_{S,ON} + L_{S,OFF} + L_{I,ON} + L_{I,OFF})$$

If the option in section 9.10 of ASHRAE 103-1993 is employed:

$$Effy_{HS} = 100 - L_{L,A} + L_G - L_C - C_J L_J - \frac{t_{ON}}{t_{ON} + \frac{Q_P}{Q_{IN}}\ t_{OFF}}\ (C_S)(L_{S,SS})$$

So, under the option in section 9.10 of ASHRAE 103-1993, (C_S)($L_{S,SS}$) is substituted for ($L_{S,ON}$ + $L_{S,OFF}$ + $L_{I,ON}$ + $L_{I,OFF}$).

This concept of replacing cyclic infiltration and sensible heat losses with steady-state infiltration and sensible heat losses also applies when dealing with two-stage and modulating condensing furnaces and boilers. DOE proposes the following equations for use in testing two-stage and modulating condensing furnaces and boilers when employing the option in section 9.10 of ASHRAE 103-1993:

11.5.11.1 Part-Load Efficiency at Reduced Fuel Input Rate

$$Effy_{U,R} = 100 - L_{L,A} + L_G - L_C - C_J L_J - \frac{t_{ON}}{t_{ON} + \frac{Q_P}{Q_{IN}}\ t_{OFF}}\ (C_S)(L_{S,SS})$$

where:

$L_{S,SS}$ = value as defined in section 11.5.6 at reduced input rate
C_S = value as defined in section 11.5.10.1 at reduced input rate

11.5.11.2 Part-Load Efficiency at Maximum Fuel Input Rate

$$Effy_{U,H} = 100 - L_{L,A} + L_G - L_C - C_J L_J - \frac{t_{ON}}{t_{ON} + \frac{Q_P}{Q_{IN}}\ t_{OFF}}\ (C_S)(L_{S,SS})$$

where:

$L_{S,SS}$ = value as defined in section 11.5.6 at maximum input rate
C_S = value as defined in section 11.5.10.1 at maximum input rate

In its investigation of the issue, AHRI developed identical equations to accommodate the option of omitting the heat-up and cool-down tests, as they pertain to two-stage and modulating condensing furnaces and boilers. (AHRI, No. 2 at p. 1)

C. Results of Preliminary DOE Testing

DOE conducted testing on two modulating condensing residential boilers to validate the equations discussed above. The test results showed that the AFUEs calculated by omitting the heat-up and cool-down tests and using of the equations discussed in section III.B.2 were within 0.04 percent AFUE of the AFUE determined using the heat-up and cool-down tests. Tables III.1 and III.2 show the results of the testing and various intermediate values for the two boilers, labeled boilers "A" and "B."

Table III.1Test Results for Boiler Model "A"

Value	Description	Scenario 1: Heat-up/ cool-down tests	Scenario 2: Employ 9.10 using new calculations
D_F	Draft Factor	.05	.05
$T_{F,ON\ t1}$	Heat-up temp @ 1 min	120	N/A

$T_{F,ON\ t2}$	Heat-up temp @ 5.5 min	124	N/A
$T_{F,OFF\ t3}$	Cool-down temp @ 3.75 min	94	N/A
$T_{F,OFF\ t4}$	Cool-down temp @ 22.5 min	81	N/A
$T_{F,OFF\ t5}$	Cool-down temp @ 45 min	75	N/A
τ_{ON}	On-cycle time constant (min)	4.096	N/A
R_{ON}	$= 15/\tau_{ON}$	3.662	N/A
τ_{OFF}	Off- cycle time constant (min)	16.266	N/A
R_{OFF}	$= 15/\tau_{OFF}$	.922	N/A
θ_{FOX}	Effective Flue gas temp differences at burner start up (F◦)	7.659	N/A
ψ_{FOX}	Effective Flue gas temp. difference at shutdown (F◦)	23.926	N/A
$C_{T,ON}$	Start- up Burner Cycling effective	.814	N/A
C_S	Correction factor that corrects for the use of outside air for combustion	1.446	1.446
$\theta_{F,O}$	Effective Flue Gas Temp Difference at burner start-up, corrected for burner cycling effect (F◦)	9.02	N/A
$R_{T,F}$	Ratio of combustion air to stoichiometric air	1.37	1.37
$K_{S,ON}$	Multiplication factor for sensible heat loss during on cycle	.0248	N/A
$L_{S,ON}$	On-cycle sensible heat loss	1.956	N/A
$K_{S,OFF}$	Multiplication factor for sensible heat loss during burner off cycle	.222	N/A
$\psi_{F\infty X}$	Minimum Flue gas temp difference above room temp	1	N/A
$\psi_{F\infty}$	Effective minimum flue gas temp difference above room temp corrected for burner cycling effect	1.22	N/A
$C_{T,OFF}$	Shutdown Burner Cycling effect correction factor	.897	N/A
ψ_{FO}	Effective Flue gas temp difference at burner shutdown, corrected for burner cycling effective (◦F)	26.18	N/A
F5	Off-cycle sensible heat loss	.0804	N/A

F6	integration factors	.0077	N/A
L_{LA}	Average Latent Heat Loss of test fuel used	9.55	9.55
$L_{S,SS}$	Average Sensible Heat Loss at Steady-State Operation	1.393	1.393
L_C	Part-Load Heat Loss Due to Condensate Going Down the Drain	.014	.014
L_G	Latent Heat Gain Under Part-Load Conditions	.6665	.6665
$L_{I,ON}$	Off-cycle infiltration loss	0	N/A
$L_{I,OFF}$	On-cycle infiltration loss	0	N/A
$L_{S,OFF}$	Off-cycle sensible heat loss, for system 9 or 10	.0199	N/A
$Effy_{SS,R}$	Steady-state efficiency at reduced firing rate	89.63	89.63
$Effy_{U,R}$	Part-load efficiency reduced firing rate	89.13	89.09
$Effy_{U,M}$	Average part-load efficiency at modulating firing rate	89.65	89.65
$Effy_{H,S}$	Heating Seasonal Efficiency	89.48	89.45
AFUE	Annual Fuel Utilization Efficiency	89.48	89.45

Table III.2 Test Results for Boiler Model "B"

Value	Description	Scenario 1: Heat-up/ cool-down tests	Scenario 2: Employ 9.10 using new calculations
D_F	Draft Factor	.05	.05
$T_{F,ON\ t1}$	Heat-up temp @ 1 min	117	N/A
$T_{F,ON\ t2}$	Heat-up temp @ 5.5 min	119.9	N/A
$T_{F,OFF\ t3}$	Cool-down temp @ 3.75 min	111	N/A
$T_{F,OFF\ t4}$	Cool-down temp @ 22.5 min	106	N/A
$T_{F,OFF\ t5}$	Cool-down temp @ 45 min	78	N/A
τ_{ON}	On-cycle time constant (min)	1.323	N/A
R_{ON}	$= 15/\tau_{ON}$	11.337	N/A
τ_{OFF}	Off- cycle time constant (min)	114.11	N/A
R_{OFF}	$= 15/\tau_{OFF}$	.1314	N/A
θ_{FOX}	Effective Flue gas temp differences at burner start up (F◦)	6.388	N/A
ψ_{FOX}	Effective Flue gas temp. difference at shutdown (F◦)	34.102	N/A

$C_{T,ON}$	Start- up Burner Cycling effective	.288	N/A
C_S	Correction factor that corrects for the use of outside air for combustion	1.541	1.541
$\theta_{F,O}$	Effective Flue Gas Temp Difference at burner start-up, corrected for burner cycling effect (F◦)	2.837	N/A
$R_{T,F}$	Ratio of combustion air to stoichiometric air	1.206	1.206
$K_{S,ON}$	Multiplication factor for sensible heat loss during on cycle	.02199	N/A
$L_{S,ON}$	On-cycle sensible heat loss	1.766	N/A
$K_{S,OFF}$	Multiplication factor for sensible heat loss during burner off cycle	0.194	N/A
$\psi_{F\infty X}$	Minimum Flue gas temp difference above room temp	6	N/A
$\psi_{F\infty}$	Effective minimum flue gas temp difference above room temp corrected for burner cycling effect	7.32	N/A
$C_{T,OFF}$	Shutdown Burner Cycling effect correction factor	.9	N/A
ψ_{FO}	Effective Flue gas temp difference at burner shutdown, corrected for burner cycling effective (◦F)	37.44	N/A
F5	Off-cycle sensible heat loss integration factors	.1897	N/A
F6		.0083	N/A
L_{LA}	Average Latent Heat Loss of test fuel used	9.55	9.55
$L_{S,SS}$	Average Sensible Heat Loss at Steady-State Operation	1.149	1.149
L_C	Part-Load Heat Loss Due to Condensate Going Down the Drain	.0577	.0577
L_G	Latent Heat Gain Under Part-Load Conditions	3.64	3.64
$L_{I,ON}$	Off-cycle infiltration loss	0	N/A
$L_{I,OFF}$	On-cycle infiltration loss	0	N/A
$L_{S,OFF}$	Off-cycle sensible heat loss, for system 9 or 10	.0487	N/A

$Effy_{SS,R}$	Steady-state efficiency at reduced firing rate	91.97	91.97
$Effy_{U,R}$	Part-load efficiency reduced firing rate	92.22	92.26
$Effy_{U,M}$	Average part-load efficiency at modulating firing rate	91.67	91.67
$Effy_{H,S}$	Heating Seasonal Efficiency	92.02	92.06
AFUE	Annual Fuel Utilization Efficiency	92.02	92.06

As shown in the tables above, the difference between the AFUE values calculated using section 9.10 of ASHRAE 103-1993 with the proposed equations and the AFUE values calculated using the heat-up and cool-down tests is 0.03 percent AFUE for boiler "A" and 0.04 percent AFUE for boiler "B." DOE believes that the difference between the two calculation methods is small enough that the AFUE values using the new equations are representative of the actual performance of the models. Thus, the resulting values are an accurate representation of the product's energy efficiency for consumer information purposes and would result in minimal additional test burden.

D. Proposed Corrective Action

DOE is proposing to amend the DOE test procedure for residential furnaces and boilers in Appendix N to subpart B of 10 CFR part 430 by adopting the alternate equations that were developed by DOE and also independently proposed by AHRI, as described in section III.B.2 above.

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

The Office of Management and Budget has determined that test procedure rulemakings do not constitute "significant regulatory actions" under section 3(f) of Executive Order 12866, "Regulatory Planning and Review," 58 FR 51735 (Oct. 4, 1993). Accordingly, this regulatory action was not subject to review under the Executive Order by the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB).

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act ("Act") (5 U.S.C. 601 et seq., as amended) requires preparation of an initial regulatory flexibility analysis (IFRA) for any rule that by law must be proposed for public comment and a final regulatory flexibility analysis (FRFA) for any such rule that an agency adopts as a final rule, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. A regulatory flexibility analysis examines the impact of the rule on small entities and considers alternative ways of reducing negative effects. Also, as required by Executive Order 13272, "Proper Consideration of Small Entities in Agency Rulemaking," 67 FR 53461 (August 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's website: http://energy.gov/gc/office-general-counsel.

DOE reviewed today's proposed rule under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. DOE has concluded that

the rule would not have a significant impact on a substantial number of small entities. The factual basis for this certification is as follows:

For manufacturers of residential furnaces and boilers, the Small Business Administration (SBA) has set a size threshold, which defines those entities classified as "small businesses" for the purposes of the Act. DOE used the SBA's small business size standards to determine whether any small entities would be subject to the requirements of the rule. 13 CFR part 121. These size standards and codes are established by the North American Industry Classification System (NAICS) and are available at http://www.sba.gov/sites/default/files/files/Size_Standards_Table(1).pdf. Residential boiler manufacturing is classified under NAICS 333414, "Heating equipment (except warm air furnaces) manufacturing," for which the size threshold is 500 employees. Residential furnace manufacturing is classified under NAICS 333415, "Air-conditioning and warm air heating equipment and commercial and industrial refrigeration equipment manufacturing" for which the size threshold is 750 employees. DOE surveyed the AHRI certification directories for furnaces and boilers, as well as the SBA database and market research tools (e.g., Hoovers[7]), to identify manufacturers of residential furnaces and boilers. DOE then consulted publically-available data or contacted companies, as necessary, to determine if they meet the SBA's definition of a "small business" manufacturer, and have their manufacturing facilities located within the United States. Based on this analysis, DOE identified 11 small businesses that manufacture residential furnaces, and 14 small businesses that manufacture residential boilers (one of which also manufactures residential furnaces), for a total of 24 small businesses potentially impacted by this rulemaking.

[7] For more information see: http://www.hoovers.com/

Today's notice of proposed rulemaking would amend DOE's test procedure by incorporating additional equations to account for the use of section 9.10 of ASHRAE 103-1993 (the relevant industry standard incorporated by reference) for two-stage and modulating condensing furnaces and boilers. As explained earlier in this notice, section 9.10 permits a manufacturer of condensing furnaces and boilers the option of omitting the specified heat-up and cool-down tests if the model has no measurable airflow through the combustion chamber and heat exchanger during the burner off period and has post-purge period(s) of less than 5 seconds. However, under the current DOE test procedure, the equations needed to use section 9.10 do not exist for two-stage and modulating condensing models, and, thus, DOE assumes that manufacturers are currently conducting the heat-up and cool-down tests in order to properly rate the performance of their two-stage and modulating condensing furnaces and boilers. Therefore, DOE believes the equations proposed for adoption today would lessen manufacturer burden in comparison to application of the current test procedure. To the extent that any manufacturers have applied the option in section 9.10, even in absence of the equations needed to use that section, to rate the AFUE of their two-stage and modulating condensing furnace and boiler models, those manufacturers would be required to re-rate their models using either today's proposed equations, if adopted in a final rule, or by conducting the heat-up and cool-down tests. The estimated costs of re-rating using the proposed equations is discussed below, along with the estimated costs of conducting the heat-up and cool-down tests.

DOE believes that manufacturers are likely to choose one of two approaches to use the proposed equations to recalculate the efficiency of two-stage and modulating condensing models for which section 9.10 has been employed: (1) manufacturers may recalculate the efficiency for

each model individually by doing the calculations manually; or (2) manufacturers may update the AFUE calculation computer program to account for the new equations.

DOE estimates that recalculating the AFUE manually using the new equation would take between 30 minutes and 1 hour per basic model. At an hourly rate of $60 for a test lab technician, DOE believes that each model that is re-rated in this manner would cost approximately $30 to $60.

Alternatively, an individual manufacturer may decide to reprogram its software for calculating AFUE to account for the new equation. DOE estimates that a programmer would need between 16 and 40 hours to rewrite the program code to account for this new equation. At an hourly rate of $80 for a programmer, the resulting cost would be a one-time expenditure of $1280 to $3200 to update the automatic AFUE calculation program. DOE notes that given the role AHRI has traditionally played and the potential for cost savings for AHRI members AHRI may decide to reprogram its software, In this case, the effort required to recalculate AFUE for individual manufacturers, would be much less than the cost AHRI would incur to modify the program, as described in the following paragraph.

DOE notes that at the time of this publication, the AHRI certification directories for residential furnaces and boilers contain a combined total of over 1800 active condensing models for which recalculation could potentially be required, although only a fraction of the total condensing models would be two-stage and modulating products which might need to be re-rated using the new equations. Further, DOE notes that AHRI required member manufacturers of

condensing two-stage or condensing modulating boilers to either: (1) re-rate their products at 90 percent AFUE; (2) discontinue the model; or (3) substantiate the model's efficiency rating by providing data from the heat up and cool down tests. (AHRI, No. 1 at p. 2) DOE examined the number of models in the AHRI certified directory for boilers that are rated at 90 percent AFUE (the majority of which are likely to be re-rated models that used option 9.10) and found that there are 210 models rated at 90 percent AFUE. If all of these models were to be re-rated through the use of the updated computer program, the per-model cost would be $6 to $15.

In comparison to re-rating product efficiency using the proposed equations, DOE estimates that conducting the heat-up and cool-down tests generally requires 2 hours combined for two-stage and modulating condensing products. In contrast, at $60 per hour for a lab technician, the cost to perform the heat-up and cool-down tests is approximately $120 per model.

When considering the costs discussed above, DOE believes they are small relative to the overall cost of manufacturing, testing, and certifying residential furnace and boiler products. DOE seeks comment on its conclusion. For the reasons stated above, DOE certifies that the proposed rule, if promulgated, would not have a significant economic impact on a substantial number of small entities. Therefore, DOE did not prepare an initial regulatory flexibility analysis for the proposed rule. DOE will transmit its certification and a supporting statement of factual basis to the Chief Counsel for Advocacy of the SBA for review pursuant to 5 U.S.C. 605(b).

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of residential furnaces and boilers must certify to DOE that their products comply with all applicable energy conservation standards. In certifying compliance, manufacturers must test their products according to the DOE test procedures for residential furnaces and boilers, including any amendments adopted for those test procedures on the date that compliance is required. DOE has established regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including residential furnaces and boilers. 76 FR 12422 (March 7, 2011). The collection-of-information requirement for certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act (PRA). This requirement has been approved by OMB under OMB control number 1910-1400. Public reporting burden for the certification is estimated to average 20 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.

D. Review Under the National Environmental Policy Act of 1969

In this proposed rule, DOE proposes test procedure amendments that it expects will be used to develop and implement future energy conservation standards for residential furnaces and

boilers. DOE has determined that this rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) and DOE's implementing regulations at 10 CFR part 1021. Specifically, this proposed rule would amend the existing test procedures without affecting the amount, quality, or distribution of energy usage, and, therefore, would not result in any environmental impacts. Thus, this rulemaking is covered by Categorical Exclusion A5 under 10 CFR part 1021, subpart D, which applies to any rulemaking that interprets or amends an existing rule without changing the environmental effect of that rule. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, "Federalism," 64 FR 43255 (August 10, 1999) imposes certain requirements on Federal agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. The Executive Order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States, and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735. DOE has examined this proposed rule and has tentatively determined that it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as

to energy conservation for the products that are the subject of today's proposed rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, "Civil Justice Reform," 61 FR 4729 (Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; (3) provide a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. Regarding the review required by section 3(a), section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and tentatively determined that, to the extent permitted by law, the proposed rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Pub. L. No. 104-4, sec. 201 (codified at 2 U.S.C. 1531). For regulatory actions likely to result in a rule that may cause the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of $100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)) The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a "significant intergovernmental mandate," and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect them. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820. (This policy is also available at http://energy.gov/gc/office-general-counsel.) DOE examined today's proposed rule according to UMRA and its statement of policy and has tentatively determined that the rule contains neither an intergovernmental mandate, nor a mandate that may result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of $100 million or more in any year. Accordingly, no further assessment or analysis is required under UMRA.

H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This rule would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

I.Review Under Executive Order 12630

Pursuant to Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights," 53 FR 8859 (March 18, 1988), DOE has determined that this proposed rule would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

J. Review Under Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for Federal agencies to review most disseminations of information to the public under information quality guidelines established by each agency pursuant to general guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). DOE has reviewed today's proposed rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OIRA at OMB, a Statement of Energy Effects for any significant energy action. A "significant energy action" is defined as any action by an agency that promulgates or is expected to lead to promulgation of a final rule, and that: (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

Today's regulatory action to amend the test procedure for measuring the energy efficiency of residential furnaces and boilers is not a significant regulatory action under Executive Order 12866 or any successor order. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects for this rulemaking.

L.Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95–91; 42 U.S.C. 7101 et seq.), DOE must comply with all laws applicable to the former Federal Energy

Administration, including section 32 of the Federal Energy Administration Act of 1974 (Pub. L. 93-275), as amended by the Federal Energy Administration Authorization Act of 1977 (Pub. L. 95-70). (15 U.S.C. 788; FEAA) Section 32 essentially provides in relevant part that, where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the Federal Trade Commission (FTC) concerning the impact of the commercial or industry standards on competition.

Today's proposed rule incorporates testing methods contained in the following commercial standard: ASHRAE 103-1993 (Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers). Today's NOPR proposes to continue the use of ASHRAE 103-1993 as the basis for the DOE test procedure, albeit with changes to certain equations. The Department has evaluated this standard and is unable to conclude whether it fully complies with the requirements of section 32(b) of the FEAA, (i.e., that it was developed in a manner that fully provides for public participation, comment, and review). DOE will consult with the Attorney General and the Chairman of the FTC concerning the impact on competition of requiring manufacturers to use the test methods contained in this standard prior to prescribing a final rule.

V. Public Participation

A. Attendance at Public Meeting

The time, date and location of the public meeting are listed in the **DATES** and **ADDRESSES** sections at the beginning of this document. If you plan to attend the public

meeting, please notify Ms. Brenda Edwards at (202) 586-2945 or Brenda.Edwards@ee.doe.gov. As explained in the **ADDRESSES** section, foreign nationals visiting DOE Headquarters are subject to advance security screening procedures. Any foreign national wishing to participate in the meeting should advise DOE of this fact as soon as possible by contacting Ms. Brenda Edwards to initiate the necessary procedures.

In addition, you can attend the public meeting via webinar. Webinar registration information, participant instructions, and information about the capabilities available to webinar participants will be published on DOE's website at: http://www1.eere.energy.gov/buildings/appliance_standards/product.aspx/productid/72. Participants are responsible for ensuring their systems are compatible with the webinar software.

B. Procedure for Submitting Requests to Speak and Prepared General Statements For Distribution

Any person who has an interest in the topics addressed in this notice, or who is representative of a group or class of persons that has an interest in these issues, may request an opportunity to make an oral presentation at the public meeting. Such persons may hand-deliver requests to speak to the address show in the **ADDRESSES** section at the beginning of this notice between 9:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays. Requests may also be sent by mail or email to Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE-2J, 1000 Independence Avenue, SW, Washington, DC 20585-0121, or Brenda.Edwards@ee.doe.gov. Persons who wish to speak should include in their request a computer diskette or CD-ROM in WordPerfect, Microsoft Word, PDF, or text (ASCII) file format that briefly describes the nature of their interest in this rulemaking and the

topics they wish to discuss. Such persons should also provide a daytime telephone number where they can be reached.

DOE requests persons selected to make an oral presentation to submit an advance copy of their statements at least one week before the public meeting. DOE may permit persons who cannot supply an advance copy of their statement to participate, if those persons have made advance alternative arrangements with the Building Technologies Program. As necessary, request to give an oral presentation should ask for such alternative arrangements.

Any person who has plans to present a prepared general statement may request that copies of his or her statement be made available at the public meeting. Such persons may submit requests, along with an advance electronic copy of their statement in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format, to the appropriate address shown in the **ADDRESSES** section at the beginning of this notice. The request and advance copy of statements must be received at least one week before the public meeting and may be emailed, hand-delivered, or sent by mail. DOE prefers to receive requests and advance copies via email. Please include a telephone number to enable DOE staff to make follow-up contact, if needed.

C. Conduct of Public Meeting

DOE will designate a DOE official to preside at the public meeting and may also use a professional facilitator to aid discussion. The meeting will not be a judicial or evidentiary-type public hearing, but DOE will conduct it in accordance with section 336 of EPCA (42 U.S.C. 6306). A court reporter will be present to record the proceedings and prepare a transcript. DOE reserves the right to schedule the order of presentations and to establish the procedures governing

the conduct of the public meeting. There shall not be discussion of proprietary information, costs or prices, market share, or other commercial matters regulated by U.S. anti-trust laws. After the public meeting, interested parties may submit further comments on the proceedings, as well as on any aspect of the rulemaking, until the end of the comment period.

The public meeting will be conducted in an informal, conference style. DOE will present summaries of comments received before the public meeting, allow time for prepared general statements by participants, and encourage all interested parties to share their views on issues affecting this rulemaking. Each participant will be allowed to make a general statement (within time limits determined by DOE), before the discussion of specific topics. DOE will allow, as time permits, other participants to comment briefly on any general statements.

At the end of all prepared statements on a topic, DOE will permit participants to clarify their statements briefly and comment on statements made by others. Participants should be prepared to answer questions by DOE and by other participants concerning these issues. DOE representatives may also ask questions of participants concerning other matters relevant to this rulemaking. The official conducting the public meeting will accept additional comments or questions from those attending, as time permits. The presiding official will announce any further procedural rules or modification of the above procedures that may be needed for the proper conduct of the public meeting.

A transcript of the public meeting will be included in the docket, which can be viewed as described in the Docket section at the beginning of this notice, and will be accessible on the DOE website. In addition, any person may buy a copy of the transcript from the transcribing reporter.

D. Submission of Comments

DOE will accept comments, data, and information regarding this proposed rule before or after the public meeting, but no later than the date provided in the **DATES** section at the beginning of this proposed rule. Interested parties may submit comments using any of the methods described in the **ADDRESSES** section at the beginning of this notice.

Submitting comments via regulations.gov. The www.regulations.gov web page will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment itself or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Otherwise, persons viewing comments will see only first and last

names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to www.regulations.gov information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (CBI)). Comments submitted through www.regulations.gov cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through www.regulations.gov before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that www.regulations.gov provides after you have successfully uploaded your comment.

Submitting comments via email, hand delivery/courier, or mail. Comments and documents submitted via email, hand delivery/courier, or mail also will be posted to www.regulations.gov. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. If you submit via mail or hand delivery/courier, please provide all items on a CD, if feasible, in which case it is not necessary to submit printed copies. No telefacsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English, and are free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery/courier two well-marked copies: one copy of the document marked "confidential" including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make

its own determination about the confidential status of the information and treat it according to its determination.

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include: (1) A description of the items; (2) whether and why such items are customarily treated as confidential within the industry; (3) whether the information is generally known by or available from other sources; (4) whether the information has previously been made available to others without obligation concerning its confidentiality; (5) an explanation of the competitive injury to the submitting person which would result from public disclosure; (6) when such information might lose its confidential character due to the passage of time; and (7) why disclosure of the information would be contrary to the public interest.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

E. Issues on Which DOE Seeks Comment

Although DOE welcomes comments on any aspect of this proposal, DOE is particularly interested in receiving comments and views of interested parties concerning the following issues:

1. The proposed equations for determining the heating seasonal efficiency (which contributes to the ultimate calculation of AFUE) of two-stage and modulating condensing furnaces and boilers that are tested under option 9.10 of ASHRAE 103-1993.

2. DOE's conclusion that the costs of complying with the proposed test procedure changes are small relative to the overall cost of manufacturing, testing, and certifying residential furnace and boiler products, along with any additional information regarding average annual revenues for manufacturers of these products.

VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of today's notice of proposed rulemaking.

List of Subjects in 10 CFR Part 430

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Imports, Incorporation by reference, Intergovernmental relations, Small businesses.

Issued in Washington, DC, on January 25, 2013.

Kathleen B. Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

For the reasons stated in the preamble, DOE is proposing to amend part 430 of Chapter II, subchapter D of Title 10, Code of Federal Regulations as set forth below:

PART 430 – ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

1.The authority citation for part 430 continues to read as follows:

Authority: 42 U.S.C. 6291-6309; 28 U.S.C. 2461 note.

2. Appendix N to subpart B of part 430 is amended by:

a. Redesignating sections 10.2 through 10.9 as sections 10.4 through 10.11;

b. Revising sections 10.0 and 10.1; and

c. Adding sections 10.2 and 10.3.

The revisions and additions read as follows:

APPENDIX N TO SUBPART B OF PART 430—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF FURNACES AND BOILERS

* * * * *

10.0 Calculation of derived results from test measurements. Calculations shall be as specified in section 11 of ANSI/ASHRAE 103-1993(incorporated by reference, see §430.3) and the October 24, 1996, Errata Sheet for ASHRAE 103-1993, except for sections 11.5.11.1, 11.5.11.2, and appendices B and C; and as specified in sections 10.1 through 10.10 and Figure 1 of this appendix.

10.1 Annual fuel utilization efficiency. The annual fuel utilization efficiency (AFUE) is as defined in sections 11.2.12 (non-condensing systems), 11.3.12 (condensing systems), 11.4.12 (non-condensing modulating systems) and 11.5.12 (condensing modulating systems) of ANSI/ASHRAE 103-1993 (incorporated by reference, see §430.3), except for the definition for the term $Effy_{HS}$ in the defining equation for AFUE. $Effy_{HS}$ is defined as:

$Effy_{HS}$ = heating seasonal efficiency as defined in sections 11.2.11 (non-condensing systems), 11.3.11 (condensing systems), 11.4.11 (non-condensing modulating systems) and 11.5.11 (condensing modulating systems) of ANSI/ASHRAE 103-1993, except that for condensing modulating systems sections 11.5.11.1 and 11.5.11.2 are replaced by sections 10.2 and 10.3 of this appendix. $Effy_{HS}$ is based on the assumptions that all weatherized warm air furnaces or boilers are located out-of-doors, that warm air furnaces which are not weatherized are installed as isolated combustion systems, and that boilers which are not weatherized are installed indoors.

10.2 Part-Load Efficiency at Reduced Fuel Input Rate. Calculate the part-load efficiency at the reduced fuel input rate, $Effy_{U,R}$, for condensing furnaces and boilers equipped with either step modulating or two-stage controls, expressed as a percent and defined as

$$Effy_{U,R} = 100 - L_{L,A} + L_G - L_C - C_J L_J -$$

$$\frac{t_{ON}}{t_{ON} + \frac{Q_P}{Q_{IN}}\ t_{OFF}}\ x\ (L_{S,ON} + L_{S,OFF} + L_{I,ON} + L_{I,OFF})$$

If the option in section 9.10 of ASHRAE 103-1993 (incorporated by reference, see §430.3) is employed:

$$Effy_{U,R} = 100 - L_{L,A} + L_G - L_C - C_J L_J - \frac{t_{ON}}{t_{ON} + \frac{Q_P}{Q_{IN}}\ t_{OFF}}\ (C_S)(L_{S,SS})$$

Where:

$L_{L,A}$ = value as defined in section 11.2.7 of ASHRAE 103-1993

L_G = value as defined in section 11.3.11.1 of ASHRAE 103-1993 at reduced input rate,

L_C = value as defined in section 11.3.11.2 of ASHRAE 103-1993 at reduced input rate,

L_J = value as defined in section 11.4.8.1.1 of ASHRAE 103-1993 at maximum input rate,

t_{ON} = value as defined in section 11.4.9.11 of ASHRAE 103-1993,

Q_P = pilot flame fuel input rate determined in accordance with section 9.2 of ASHRAE 103-1993 in Btu/h

Q_{IN} = value as defined in section 11.4.8.1.1 of ASHRAE 103-1993,

t_{OFF} = value as defined in section 11.4.9.12 of ASHRAE 103-1993 at reduced input rate,

$L_{S,ON}$ = value as defined in section 11.4.10.5 of ASHRAE 103-1993 at reduced input rate,

$L_{S,OFF}$ = value as defined in section 11.4.10.6 of ASHRAE 103-1993 at reduced input rate,

$L_{I,ON}$ = value as defined in section 11.4.10.7 of ASHRAE 103-1993 at reduced input rate,

$L_{I,OFF}$ = value as defined in section 11.4.10.8 of ASHRAE 103-1993 at reduced input rate,

C_J = jacket loss factor and equal to:

= 0.0 for furnaces or boilers intended to be installed indoors

= 1.7 for furnaces intended to be installed as isolated combustion systems

= 2.4 for boilers (other than finned-tube boilers) intended to be installed as isolated combustion systems

= 3.3 for furnaces intended to be installed outdoors

= 4.7 for boilers (other than finned-tube boilers) intended to be installed outdoors

= 1.0 for finned-tube boilers intended to be installed outdoors

= 0.5 for finned-tube boilers intended to be installed in ICS applications

$L_{S,SS}$ = value as defined in section 11.5.6 of ASHRAE 103-1993 at reduced input rate,

C_S = value as defined in section 11.5.10.1 of ASHRAE 103-1993 at reduced input rate.

10. 3 Part-Load Efficiency at Maximum Fuel Input Rate. Calculate the part-load efficiency at maximum fuel input rate, $Effy_{U,H}$, for condensing furnace and boilers equipped with two-stage controls, expressed as a percent and defined as:

$$Effy_{U,H} = 100 - L_{L,A} + L_G - L_C - C_J L_J -$$

$$\frac{t_{ON}}{t_{ON} + \frac{Q_P}{Q_{IN}}\ t_{OFF}}\ x\ (L_{S,ON} + L_{S,OFF} + L_{I,ON} + L_{I,OFF})$$

If the option in section 9.10 of ASHRAE 103-1993 (incorporated by reference, see §430.3) is employed:

$$Effy_{U,H} = 100 - L_{L,A} + L_G - L_C - C_J L_J - \frac{t_{ON}}{t_{ON} + \frac{Q_P}{Q_{IN}}\ t_{OFF}}\ (C_S)(L_{S,SS})$$

Where

$L_{L,A}$ = value as defined in section 11.2.7 of ASHRAE 103-1993,

L_G = value as defined in section 11.3.11.1 of ASHRAE 103-1993 at maximum input rate,

L_C = value as defined in section 11.3.11.2 of ASHRAE 103-1993 at maximum input rate,

L_J = value as defined in section 11.4.8.1.1 of ASHRAE 103-1993 at maximum input rate,

t_{ON} = value as defined in section 11.4.9.11 of ASHRAE 103-1993 of ASHRAE 103-1993,

Q_P = pilot flame fuel input rate determined in accordance with section 9.2 of ASHRAE 103-1993 in Btu/h,

Q_{IN} = value as defined in section 11.4.8.1.1 of ASHRAE 103-1993,

t_{OFF} = value as defined in section 11.4.9.12 of ASHRAE 103-1993 at maximum input rate,

$L_{S,ON}$ = value as defined in section 11.4.10.5 of ASHRAE 103-1993 at maximum input rate,

$L_{S,OFF}$ = value as defined in section 11.4.10.6 of ASHRAE 103-1993 at maximum input rate,

$L_{I,ON}$ = value as defined in section 11.4.10.7 of ASHRAE 103-1993 at maximum input rate,

$L_{I,OFF}$ = value as defined in section 11.4.10.8 of ASHRAE 103-1993 at maximum input rate,

C_J = value as defined in section 10.2 of this appendix,

$L_{S,SS}$ = value as defined in section 11.5.6 of ASHRAE 103-1993 at maximum input rate,

C_S = value as defined in section 11.5.10.1 of ASHRAE 103-1993 at maximum input rate.

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