at the bridge as soon as possible, but not more than one hour after malfunction or disability of the remote system.

* * * * *

Dated: October 30, 2014.

Stephen P. Metruck,

Rear Admiral, United States Coast Guard, Commander, Fifth Coast Guard District.

[FR Doc. 2014–27296 Filed 11–18–14; 8:45 am]

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 60 and 63

[EPA–HQ–OAR–2009–0234; EPA–HQ–OAR–2011–0044; FRL–9919–29–OAR]

RIN 2060–AS07

Reconsideration of Certain Startup/Shutdown Issues: National Emission Standards for Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units

AGENCY: Environmental Protection Agency.

ACTION: Final rule; notice of final action on reconsideration.

SUMMARY: The Environmental Protection Agency (EPA) is taking final action on its reconsideration of the startup and shutdown provisions in the final rules titled, ''National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units.'' The national emission standards for hazardous air pollutants (NESHAP) issued pursuant to Clean Air Act (CAA) section 112 are referred to as the Mercury and Air Toxics Standards (MATS), and the new source performance standards (NSPS) issued pursuant to CAA section 111 are referred to as the Utility NSPS.

On November 30, 2012, the U.S. Environmental Protection Agency (EPA) granted reconsideration of, proposed, and requested comment on a limited set of issues in the February 16, 2012, final MATS and Utility NSPS, including certain issues related to the final work practice standards applicable during startup periods and shutdown periods. On June 25, 2013, the EPA reopened the public comment period for the reconsideration issues related to the startup and shutdown provisions of MATS and the startup and shutdown provisions related to the particulate matter (PM) standard in the Utility NSPS. The EPA is now taking final action on the standards applicable during startup periods and shutdown periods in MATS and on startup and shutdown provisions related to the PM standard in the Utility NSPS.

DATES: The effective date of the rule is November 19, 2014.

ADDRESSES: *Docket.* The EPA established two dockets for this action: Docket ID No. EPA–HQ–OAR–2011–0044 (NSPS action) and Docket ID No. EPA–HQ–OAR–2009–0234 (MATS NESHAP action). All documents in the dockets are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available (e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute). Certain other material, such as copyrighted material, will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the EPA Docket Center, Room 3334, 1301 Constitution Avenue NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: For the MATS NESHAP action: Mr. William Maxwell, Energy Strategies Group, Sector Policies and Programs Division (D243–01), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; Telephone number: (919) 541–5430; Fax number (919) 541–5450; Email address: *maxwell.bill@epa.gov.* For the NSPS action: Mr. Christian Fellner, Energy Strategies Group, Sector Policies and Programs Division (D243–01), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; Telephone number: (919) 541–4003; Fax number (919) 541–5450; Email address: *fellner.christian@epa.gov.*

SUPPLEMENTARY INFORMATION:

Outline. The information presented in this preamble is organized as follows:

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I. General Information

A. Does this action apply to me?

Categories and entities potentially affected by this action include:

Category	NAICS Code [1]	Examples of potentially regulated entities
Industry	221112	Fossil fuel-fired electric utility steam generating units.
Federal government	[2] 221122	Fossil fuel-fired electric utility steam generating units owned by the federal government.
State/local/tribal government	[2] 221122	Fossil fuel-fired electric utility steam generating units owned by municipalities.

Category	NAICS Code [1]	Examples of potentially regulated entities
	921150	Fossil fuel-fired electric utility steam generating units in Indian country.

[1] North American Industry Classification System.
[2] Federal, state, or local government-owned and operated establishments are classified according to the activity in which they are engaged.

This table is not intended to be exhaustive, but rather to provide a guide for readers regarding entities likely to be affected by this action. To determine whether your facility, company, business, organization, etc., would be regulated by this action, you should examine the applicability criteria in 40 CFR 60.40, 60.40Da, or 60.40c or in 40 CFR 63.9982. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permitting authority for the entity or your EPA regional representative as listed in 40 CFR 60.4 or 40 CFR 63.13 (General Provisions).

B. How do I obtain a copy of this document?

In addition to being available in the docket, an electronic copy of this final rule will be available on the World Wide Web (WWW) through the Technology Transfer Network (TTN). Following signature, a copy of the action will be posted on the TTN's policy and guidance page for newly proposed or promulgated rules at the following address: *http://www.epa.gov/ttn/oarpg/.* The TTN provides information and technology exchange in various areas of air pollution control. A copy of this action will also be available on: *www.epa.gov/mats/.*

C. Judicial Review

Under CAA section 307(b)(1), judicial review of this final rule is available only by filing a petition for review in the U.S. Court of Appeals for the District of Columbia Circuit by January 20, 2015. Under CAA section 307(d)(7)(B), only an objection to this final rule that was raised with reasonable specificity during the period for public comment can be raised during judicial review. Note, under CAA section 307(b)(2), the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce these requirements.

II. Background

On February 16, 2012, the final MATS and the Utility NSPS rules were published in the **Federal Register**. 77 FR 9304. Following promulgation of the final rules, the Administrator received petitions for reconsideration of various provisions of both MATS and the Utility NSPS pursuant to CAA section 307(d)(7)(B), including requests to reconsider the work practice standards applicable during startup periods and shutdown periods that were included in the final rule. Copies of the MATS petitions are provided in Docket ID No. EPA–HQ–OAR–2009–0234. Copies of the Utility NSPS petitions are provided in Docket ID No. EPA–HQ–OAR–2011–0044. The EPA granted reconsideration of the startup and shutdown provisions because the agency proposed to require sources to comply with the numeric standards at all times and did not propose a work practice standard for startup periods and shutdown periods; thus, the public was not provided an opportunity to comment on the work practice requirements contained in the final rule.[1] On November 30, 2012, the EPA published a proposed rule reconsidering certain new source standards issued in MATS and the startup and shutdown provisions in MATS and the Utility NSPS, among other things. 77 FR 71323. The EPA proposed certain minor changes to the startup and shutdown provisions contained in the 2012 final rule based on information obtained in the petitions for reconsideration. On April 24, 2013 (78 FR 24073), the EPA took final action on the new source standards that were reconsidered and also the technical corrections contained in the November 30, 2012, proposed action. The EPA did not take final action on the startup and shutdown provisions, and, on June 25, 2013, the EPA added new information and analysis to the docket and reopened the public comment period for the proposed revisions to the startup and shutdown provisions in MATS and the startup and shutdown provisions related to the PM standard in the Utility NSPS.

III. Summary of This Action

This final action includes final amendments to the startup and shutdown provisions of the final MATS and Utility NSPS issued by the EPA on February 16, 2012. This action does not alter or reopen any other MATS or Utility NSPS provisions, including those provisions recently upheld by the U.S. Court of Appeals for the District of Columbia Circuit (Court) in *White Stallion Energy Center* v. *EPA* on April 15, 2014. 784 F.3d 1222 (D.C. Cir. 2014). The February 2012 final rule is and remains in effect for all sources, and existing sources must comply with the final rule by April 16, 2015, or seek an extension of that compliance date from the appropriate title V permitting authority.

The November 30, 2012, proposed reconsideration rule reopened, among other things: (1) The requirements applicable during startup periods and shutdown periods in MATS, and (2) the startup and shutdown provisions related to the PM standard in the Utility NSPS. We are taking final action today on the requirements for startup periods and shutdown periods contained in 40 CFR Part 63, subpart UUUUU, and 40 CFR Part 60, subpart Da.

As noted above, in the proposed reconsideration rule, the EPA proposed revisions to, and took comment on, the definitions of "startup" and "shutdown" and the work practice requirements associated with those periods in the final MATS rule. The EPA also took comment on the startup and shutdown provisions relating to the PM standard in the Utility NSPS. The EPA received a number of comments regarding the proposed startup and shutdown provisions, including data and information relevant to the proposed work practice standard that applies during such periods, and the agency also reviewed EGU nitrogen oxides (NO_X) and sulfur dioxide (SO_2) emissions data generated during startup periods and shutdown periods and submitted to the EPA pursuant to title IV of the CAA (i.e. the Acid Rain Program). On June 25, 2013 (78 FR 38001), the EPA reopened the public comment period on the startup/shutdown provision and solicited comment on both the public comments

[1] The EPA continues to believe that the final existing source standards contain sufficient variability to include startup periods and shutdown periods. Furthermore, in light of what we have learned concerning the performance of the best performing sources during startup and shutdown (e.g., clean fuel use and efficient engagement of air pollution control devices (APCDs)), we believe that the best performing electric utility steam generating units (EGUs) for startup periods and shutdown periods will have hazardous air pollutant (HAP) emissions that are lower than the numeric standards, when averaged over the startup and shutdown period as defined. However, as explained in the record, the lack of HAP data for these periods and the current technical challenges to accurately measure HAP emissions during startup and shutdown cause us to establish a work practice for such periods.

provided in response to the November 30, 2012, proposal, as well as the startup and shutdown technical support document (TSD) that was based on the Acid Rain Program data that was made available in the docket.[2] The agency has reviewed all of the comments received on the startup and shutdown issues. As described below, the EPA is taking final action on the startup and shutdown provisions in MATS and the Utility NSPS.

Because this final rule is very similar to the February 2012 final rule, the impacts of these revisions on the costs and the benefits of the final rule are minor.

IV. Summary of Final Action and Changes Since Proposal—MATS Startup/Shutdown Issues

After consideration of the public comments received and other information, the EPA is finalizing the startup and shutdown provisions contained in the final MATS rule and we are also finalizing an alternative compliance option for startup periods and shutdown periods.[3] We address several significant comments in this preamble. For a complete summary of the comments received on the issues we are finalizing today and our responses thereto, please refer to the memorandum "National Emission Standards For Hazardous Air Pollutants From Coal- And Oil-Fired Electric Utility Steam Generating Units—Reconsideration Of Certain Startup/Shutdown Issues; Summary Of Public Comments And Responses" (RTC) in Docket ID No. EPA–HQ–OAR–2009–0234.

As discussed in more detail below, the alternative work practice standard for startup periods and shutdown periods requires coal- and oil-fired EGUs to initiate startup using only clean fuels and to continue combusting the maximum amount of clean fuels possible at the facility throughout the entire startup period. EGUs that chose to comply with the alternative work practice will be required to have sufficient clean fuel capacity to startup and warm the facility to the point where the primary PM controls (e.g., fabric filters (FFs) and electrostatic precipitators (ESPs)) can be brought on line at the same time as, or within 1 hour of, the addition of the primary fuel (i.e., coal, residual oil, or solid oil-derived fuel) to the EGU. If a facility does not have sufficient clean fuel capacity to enable initiation and operation of the PM controls within 1 hour of addition of primary fuel, then the source will have to increase its clean fuel capacity or take other action to comply with the work practice requirements in this final rule.[4] The alternate included in this final rule also requires EGUs to comply with the applicable numeric standards within 4 hours of the generation of electricity or thermal energy for use either on site or for sale over the grid (i.e., the end of startup) and to continue to maximize clean fuel use throughout that period.

The EPA has established these final alternative requirements after determining what the best performing EGUs do during startup periods and shutdown periods. The EPA used several different metrics to determine the best performing sources for various aspects of the work practice requirements and definitions. Specifically, concerning the use of clean fuels, the comments received and the Acid Rain data in the record indicate that most EGU operations start using clean fuels and that many of those EGUs generate electricity while using clean fuels and/or routinely engage their PM controls before or within 1 hour of beginning to combust coal, residual oil, or solid oil-derived fuel. The clean fuels identified by the commenters and included in the final rule are inherently cleaner from a HAP emissions perspective than coal, residual oil, or solid oil-derived fuel, and, for this reason, maximizing the use of clean fuels during startup will greatly limit the emissions of HAP while EGUs are warming up to temperatures sufficient to engage the air pollution control devices (APCDs). Thus, we considered those EGUs that use clean fuels for the longest period of time before the introduction of coal and the generation of electricity to be the best performing EGUs because they are likely to have the lowest amount of HAP emissions during the startup period. In addition, the best performing EGUs were also determined to be those with the ability to engage PM control devices at the time (i.e., within 1 hour) of introduction of primary fuel. Further, we believe all of the concerns raised by commenters about the ability to engage the PM controls can be safely resolved to allow compliance with the final work practice, as explained in the RTC.[5] We believe it is appropriate to use generation of electricity as an indicator of startup for two reasons. First, the information we have indicates that the only reason the owner/operator of an EGU chooses to fire fuel in a boiler is to generate electricity. Therefore, any event that starts with firing of fuel in a boiler that has been shut down will culminate in generation of electricity. Second, introduction of coal to the boiler is also always associated with generation of electricity. The TSD and other information confirm our understanding.

For determining the appropriate time after generation to define the end of startup (i.e., the time when the numerical standards apply), the EPA conducted an analysis of continuous emission monitor system (CEMS) data for NO_X and SO_2 from EGUs to determine the range of times after initial generation of electricity or thermal energy that EGUs typically take to engage and operate all of their APCDs. The EPA determined the best performing 12 percent of EGUs by identifying those EGUs that were able to engage their APCDs most quickly after the initial generation of electricity or thermal energy and averaged that time to determine the end of the startup period when the numeric standards would become applicable. Specifically, we evaluated the average startup period for the best performing 12 percent of EGUs for which the EPA has the relevant data (i.e., those with the relevant NO_X and/or SO_2 controls). We

[2] The EPA is still reviewing the other issues raised in the petitions for reconsideration and is not taking any action at this time with respect to those issues.

[3] This preamble does not discuss the startup and shutdown provisions provided in the February 2012 final MATS rule. (See 77 FR 9486, 9493–9494.) We are not altering those provisions in this final action. However, the critical control requirement (i.e., the requirement to use clean fuels to start and warm the EGU and relevant controls prior to coal, residual, or solid oil-derived fuel combustion, as well as recordkeeping and reporting procedures for those requirements) is the same for both. We are maintaining the final rule approach and will evaluate the continued need for the alternative definition during our ongoing 8-year reviews. We intend to use HAP and HAP surrogate data collected during periods of startup and periods of shutdown to evaluate the accuracy of CEMS from the start of electricity generation to the end of startup as defined under the alternative included in this final rule (i.e., 4 hours after electricity generation). We will use these data to help determine whether it is appropriate to make changes to the rule in the future.

[4] We note that the startup and shutdown provisions contained in the February 16, 2012, final MATS rule also required EGUs to maximize clean fuels during startup periods and shutdown periods, as sources are required to comply with all MATS and NSPS standards at the time of electricity generation. Therefore, EGUs complying with the work practice as finalized on February 16, 2012, will necessarily be required to warm their units on clean fuels alone for extended periods unless the operators determine that compliance over the 30-day averaging period can be achieved without certain HAP controls for a portion of time after the defined startup period. EGU operators may conclude compliance without controls for a short period after startup is possible for a number of reasons, including the variability included in the numeric standards and our understanding from regulating many HAP categories that sources generally over-control to ensure a compliance margin is maintained.

[5] See, e.g., EPA–HQ–OAR–2009–0234–20269, –20275, and –20303.

used 12 percent of the sources with the relevant controls because the metric upon which the end of startup is based depends on the presence of the relevant controls, not on the actual NO_X and SO_2 emissions. Thus, sources without the relevant controls cannot be compared against sources with the relevant controls for purposes of defining the end of startup in this final rule. CAA section 112(d)(3)(A) directs the EPA to establish MACT floor standards based on the performance on the best performing 12 percent of sources for which the Administrator has data, and, in this case, the agency does not have relevant data from all sources in the category. For this reason, it is reasonable to establish the work practice based on 12 percent of the sources with the relevant data (i.e., those EGUs with the relevant NO_X or SO_2 controls).

We used this approach to determine the end of startup because it is reasonable to expect the EGUs that are able to most quickly and efficiently engage their controls after the generation of electricity to be the best performing sources and to have the lowest HAP emissions during and directly after the startup period, and because we are confident that EGUs will be able to accurately measure HAP emissions with CEMS at this time. The requirement to maximize the use of clean fuels (with inherently low HAP emissions) during the startup period ensures that HAP emissions are minimized during that time. Because EGUs subject to Acid Rain Program requirements are required to submit continuous NO_X and SO_2 data to the EPA, the agency believes it has data on all startup events from those EGUs subject to that program, which comprise nearly all EGUs subject to this rule, for over a decade. Thus, we believe we have a full data set from which to determine the end of the startup period for the best performing 12 percent of sources for which we have the relevant data.[6] We maintain it is reasonable to use the CAA section 112(d)(3) metric for establishing MACT floors for existing sources as a starting point for determining the appropriate work practice when presented with such comprehensive data. *See* CAA 112(h)(1) (directing the agency to establish a work practice standard "which in the Administrator's judgment is consistent with the provisions of subsection (d) or (f) of this section.").

[6] We note that these data are not reliable for quantifying emissions for this analysis but, rather, the data allow us to evaluate when controls are turned on for the purpose of determining when startup ends.

For shutdown periods, the EPA determined that sources could cease adding coal or oil to the EGU prior to shutting down the APCDs. We determined that sources able to run their control devices even after coal or oil is added to the EGU for the last time before shutdown were the best performing sources because HAP emissions would be minimized as the EGU combusts the remaining coal or oil in the boiler.

The final work practice standard, when applied across the industry, will greatly reduce HAP emissions during startup periods and shutdown periods. The requirement to maximize clean fuel use throughout the startup period will significantly limit HAP emissions because of the inherently low HAP emissions associated with the clean fuels identified in 40 CFR 63.10042.[7] In addition, the requirement to engage and operate PM controls as expeditiously as possible and within 1 hour of coal, residual oil, or solid oil-derived fuel combustion will limit HAP emissions that are particulate in nature throughout the remainder of the startup period. We believe that application of this work practice will lead to HAP emissions during startup periods and shutdown periods that are comparable to, and potentially lower than, those levels authorized during normal operations when averaged over the entire startup and/or shutdown period. During the 8-year review required under CAA section 112(d)(6), the agency intends to further assess HAP emissions during startup and shutdown based on data collected from sources complying with the final rule, though we recognize that prospectively our ability to establish numerical standards during startup periods and shutdown periods will depend, at least in part, on the further development of testing methodologies that will allow the agency to accurately measure emissions during those periods with an acceptable level of certainty.

The specific provisions of the alternative startup and shutdown requirements and our rationales for those provisions are discussed in more detail below and in the RTC document in Docket ID No. EPA–HQ–OAR–2009–0234.

[7] Natural gas is one of the clean fuels identified in this final rule and the agency determined in 2000 that it was neither appropriate nor necessary to regulate natural gas-fired EGUs because the impacts from HAP emissions from such units are "negligible." See "Regulatory Finding on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units," 65 FR 79825, 79831 (December 20, 2000).

1. Definitions

In the November 2012 reconsideration proposal, we proposed revisions to the definitions of startup and shutdown contained in the final MATS rule and set forth in 40 CFR 63.10042, after receiving petitions for reconsideration of the startup and shutdown provisions in the final MATS rule. Petitioners asserted, among other things, that the final rule's definitions of startup and shutdown were not sufficiently clear, should accommodate operation of cogeneration units, and did not accurately reflect startup conditions for all affected units. We received additional comments on these issues during the public comment periods. For more discussion of the petitions for reconsideration and the comments on the definitions in the final rule, see the RTC in Docket ID No. EPA–HQ–OAR–2009–0234.

As a result of comments received on the November 2012 proposal and the June 2013 reopening of the public comment period, we have further revised the proposed definitions as follows.

a. Startup. The definition of startup in the November 2012 reconsideration proposed rule was similar to the definition the EPA finalized in MATS in February 2012. In this final reconsideration rule, we have maintained the final MATS definition of startup and, in addition, are finalizing an alternative definition of startup based on the November 2012 proposal and the analysis in the startup and shutdown TSD. Sources may choose to use either definition of startup when complying with the startup and shutdown requirements. We are finalizing both definitions because we believe that they both meet the requirements of CAA section 112 to reduce HAP emissions during this time period and will provide operators with flexibility, even though we question the ability to accurately measure HAP emissions at the start of electricity generation. A discussion of the comments and analyses that led to inclusion of the alternative startup definition is provided below.

In the November 2012 reconsideration proposal, the EPA proposed that startup be defined as the period in which operation of an EGU is initiated for any purpose. The proposed definition indicated that startup begins with either the first-ever firing of fuel in an EGU for the purpose of producing electricity or useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes or the firing of fuel in an EGU for any purpose after a shutdown event. The proposed

definition indicated that startup ended when the EGU generates electricity that is sold or used for any other purpose (including on site use), or the EGU makes useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes, whichever is earlier. The agency received comments stating that the general approach provided in the proposed definition of ''startup'' (particularly the end of startup) was directionally correct but did not allow sufficient time for the APCDs to become effective and, thus, the industry was concerned that some EGUs would not be able to achieve the MATS emission limits finalized in the February 2012 rule at the end of startup as defined in the final MATS rule. The comments further stated the opinion that startup did not end with first generation of electricity or production of steam as the EPA had proposed. Instead, some comments suggested that the defined end of startup should be changed to be 4 hours after 25-percent load is first reached or 12 hours after first electricity generation, whichever occurs first. Some comments stated that even longer time periods were necessary for certain types of EGUs, that different startup periods should be defined for different types of EGUs, and that additional consideration should be given to a wider variety of APCDs. Other comments maintained that the definition in the final MATS rule was appropriate and indicated that any extension of time during which the EGUs were not subject to the final rule's emission limits was not in accordance with CAA section 112.

The EPA disagrees with the commenters to the extent they maintain that a work practice is required after emissions can be accurately measured or that the agency is bound to the time contained in the final rule where, as here, we conclude that the HAP measurement methodologies are not capable of accurately measuring HAP emissions during the defined startup period. The EPA did, however, conduct an additional technical analysis after its initial review of the comments and in June 2013 published a document reopening the public comment period. The document specifically requested comment on the additional technical analysis the EPA had conducted in response to comments received concerning the end of startup. See ''Assessment of startup period at coal-fired electric generating units'' (Docket ID No. EPA–HQ–OAR–2009–0234–20378). In the analysis, the EPA examined several indicators that allowed the agency to assess the time required to engage APCDs at affected EGUs. Using these indicators, we found no significant difference in performance related to startup between the different groups or types of EGUs assessed in the analysis (e.g., circulating fluidized bed (CFB), stoker, subcritical, supercritical). We further indicated that the results of our analysis supported defining the end of startup at coal- and oil-fired EGUs as occurring at the time to achieve 25 percent of the EGU's nameplate generating capacity (megawatts, MW) plus 3 hours, or the start of electricity generation plus 6 hours, whichever comes first.

The EPA has reviewed all of the comments received on the proposed definition of startup in response to these two opportunities for public comment and has revised the June 2013 analysis. Based on this review, we are finalizing a revised definition of ''startup'' that uses the approach outlined in the June 2013 assessment with revisions as discussed below.

Defining the End of ''Startup''

The June 2013 analysis suggested a potential end time for startup of 6 hours after the start of electricity generation or 3 hours after a coal- or oil-fired EGU reaches 25 percent of nameplate capacity, whichever occurs first. In other words, 6 hours after the start of generation or 3 hours after reaching electricity generation equal to 25 percent of nameplate capacity, whichever comes first, an EGU would have to start monitoring and reporting its emissions for the purpose of complying with the numeric emissions standards contained in MATS.

The EPA took this approach because we determined that flue gas conditions will be adequate to accurately measure HAP emissions with CEMS 4 hours after the generation of electricity. The approach evaluated the time for all APCDs to be functioning because we determined that stack conditions will be stable at this point. The analysis was based on our review of hourly SO_2 and NO_X emissions from CEMS installations from nearly 9,500 distinct startup events at more than 400 coal-fired EGUs, including CFB boilers, and subcritical and supercritical pulverized coal boilers equipped with SO_2 APCDs (e.g., wet or dry flue gas desulfurization (FGD)) and/or NO_X APCDs (e.g., selective catalytic reduction (SCR)). The EPA analyzed hourly SO_2 and NO_X emissions primarily because changes in SO_2 and NO_X emissions are reasonable indicators of when APCDs are operational and stack conditions will be sufficiently stable to allow for accurate measurement of HAP emissions with CEMS. We also note that SO_2 emissions are a surrogate for acid gases (e.g., hydrogen chloride); SO_2 APCDs can be used for co-benefit mercury (Hg) control; and NO_X SCR APCDs may increase the oxidation of Hg, influencing the effectiveness of Hg controls.[8] The goal of the analysis was to identify the approximate time it took, on average, to initiate operation of SO_2 and NO_X APCDs because it was those controls (e.g., scrubbers and SCR) that industry commenters stated required additional time to engage after the start of generation of electricity or useful thermal energy. The goal in conducting the analysis was not to determine the time it took for APCDs at all EGUs to become fully operational, but instead to determine the average time for the engagement of APCD to determine a reasonable end of startup.

The EPA received detailed comments on the June 2013 analysis and the proposed rule. Although commenters' opinions varied, the EPA identified three distinct groups of comments. The first group agreed with the EPA's approach to define a time limit following the start of generation, but many commenters suggested that more time was necessary to safely and/or fully engage APCDs. The second group commented that CAA section 112 requires the EPA to establish standards based on the average of the best performing 12 percent of EGUs, not the average of the fleet. The third group disagreed with the EPA's approach, stating that many APCDs could not be fully functional within the time limits specified by the EPA, and citing the need for greater flexibility.

The EPA evaluated the information provided by commenters and considered the different approaches to define the end of startup.[9] After careful consideration and in light of issues raised in comments and data provided, the EPA has revised its initial approach for determining the end of startup in

[8] The EPA did not include hourly PM data in this analysis because PM CEMS data are not available and PM CEMS have not yet been certified to accurately measure during periods of startup and periods of shutdown as defined in this final rule.

[9] It is important to remember that the hour at which startup ends is the hour at which reporting for the purpose of determining compliance begins. Therefore, EGUs must collect and report emissions and heat input or generation data following the end of startup. These data are used in calculating whether an EGU is in compliance with the 30-day average emission limits. MATS does not mandate that all APCDs must be fully operational at the end of startup (nor does it mandate that emissions during any given hour during this period must be below the 30-day average emission limits); rather, MATS mandates only that sources comply with the MATS emission standards at that time.

several respects. First, in the June 2013 analysis, we did not attempt to identify the EGUs that were the best performing sources, but instead simply looked at a category-wide average time for engagement of APCDs. As certain commenters noted, the category-wide average may not satisfy the CAA section 112(h) requirement that the EPA establish work practice standards "which in the Administrator's judgment [are] consistent with the provisions of subsections (d) or (f) of this section [112]." To more appropriately track this statutory directive, the EPA revised the analysis and identified the EGUs that were able to most quickly engage their APCDs because we determined that the best performing EGUs for purposes of defining the end of startup are those that are able to most efficiently engage their controls after the start of electricity generation. The EPA then averaged the time it took for such EGUs to bring their APCDs on line to determine a reasonable time after generation of electricity to define the end of startup. The EPA chose this approach in the final rule because we believe it most closely follows the requirements of CAA section 112.

The EPA analysis of startup events at coal-fired EGUs indicates that the best performing EGUs can, on average, initiate operation of their SO_2 and NO_X APCDs within 4 hours following the start of generation (see Technical Support Document (TSD) titled "Assessment of startup period at coal-fired electric generating units—Revised" in Docket ID No. EPA–HQ–OAR–2009–0234). In addition, the Agency is confident that stack conditions at this time are conducive for accurate measurements of HAP emissions using CEMS. For these reason, and because SO_2 can be used as a surrogate for the control of acid gases and SO_2 and NO_X APCDs can impact the control of Hg emissions, and because we believe based on comments and other information that SO_2 and NO_X controls are generally the last APCDs to be engaged, the EPA has determined that the end of startup should be defined as the end of the 4th hour following the start of generation of electricity or useful thermal energy. The agency has also determined that it is not necessary to include any additional variability because the agency believes it has information on all of the startup events from the EGUs with the relevant data so startup time variability is fully represented in the available data.

b. Shutdown. The EPA is maintaining the definition of "shutdown" proposed in the November 2012 action, and further requiring that all APCDs must be operated as long as coal, residual oil, or solid oil-derived fuel is being fired in the EGU and as long thereafter as possible, considering safety and system integrity.

The RTC contains a summary of the comments received on this topic and the EPA's response to those comments.

2. Work Practice Standards and Clean Fuels

The final work practice for startup periods requires EGUs to initiate startup using clean fuels and to combust only clean fuels until primary fuel (e.g., coal, residual oil, or solid oil-derived fuel) is fed into the EGU, at which time the EGU must engage and operate its PM controls as soon as possible and no later than 1 hour thereafter. After engagement of PM controls, EGUs are required to maintain maximum clean fuel use until the end of startup (i.e., 4 hours after the start of generation of electricity or useful thermal energy). The maximization of clean fuel use after addition of primary fuel to the EGU assures that the least amount of HAP possible will be emitted from the units during the startup period. The final rule also includes more fuels on the list of clean fuels that may be combusted during startup periods and shutdown periods, as discussed below.

The EPA is finalizing a requirement in the work practice that PM controls be engaged and operated within 1 hour of coal, residual oil, or solid oil-derived fuel being fired. In the November 2012 proposal, the EPA proposed to require that once an EGU starts firing coal, residual oil, or solid oil-derived fuel, all of the applicable control devices had to be engaged, with certain listed exceptions. PM-specific control devices were not included in that list of excepted controls because the EPA believed that PM controls on EGUs could be engaged (i.e., operational) at the best performing EGUs at the time the primary fuel (i.e., coal, residual oil, or solid oil-derived fuel) is fired. The EPA has reviewed both the record and the comments received, and we have determined that the EGUs that are able to engage PM controls (through either use of PM-specific controls (e.g., ESP, FF) or wet FGD scrubber system alone or in conjunction with PM controls) within 1 hour following the initiation of firing of coal, residual oil, or solid oil-derived fuel are the best performing sources for purposes of minimizing particulate HAP emissions during startup periods.[10] Therefore, we are finalizing a requirement that an owner/operator must engage and operate the PM controls within 1 hour of first firing of coal, residual oil, or solid oil-derived fuel.

Moreover, in order to demonstrate an EGU's capacity to maximize the use of clean fuels during startup periods and its ability to bring PM control devices online in an expeditious manner following first firing of coal, residual oil, or solid oil-derived fuel, the rule now requires EGU owners or operators to determine and report each EGU's maximum storage capacity for clean fuels and maximum capacity for heat input while combusting clean fuels alone. The rule also requires EGU owners or operators to identify, record, and report semiannually each instance of startup or shutdown, specifying the dates and times that clean fuel use begins and ends; the dates and times that primary (i.e., coal or oil) fuel use starts or ends; and the hourly clean fuel usage, heat input, and electrical output.

In addition, for those non-liquid oil-fired EGUs not using PM CEMS, HAP metals CEMS, or PM continuous parameter monitoring system (CPMS) as a compliance determination method or not meeting low emitting EGU (LEE) status[11] for PM or non-mercury HAP metals emissions or those liquid oil-fired EGUs not using PM CEMS or PM CPMS as a compliance determination method or not meeting LEE status for PM or HAP metals emissions, parametric monitoring data will be required to help show PM control device effectiveness upon first use of coal, residual oil, or solid oil-derived fuel. This type of data is not required from EGUs using PM CEMS, HAP metals CEMS, or PM CPMS, as those instruments are already required to provide these data during startup periods; those data are suitable for assessing how soon and how well PM control devices are operating. Likewise, once EGUs meet the LEE status for PM or non-mercury HAP metals emissions for non-liquid oil-fired EGUs (or HAP metals emissions for liquid oil-fired EGUs), they will no longer need to supply additional information regarding PM control device operation during startup periods, for it is reasonable to expect their PM control devices to be properly sized and operated in order to demonstrate consistent operation at less than 50 percent of the emissions limit over a 3-year period. It is also reasonable to expect that the information recorded and calculated during startup periods and shutdown periods from LEE-eligible EGUs will show better emissions performance

[10] Docket ID Nos. EPA–HQ–OAR–2009–0234–20269, EPA–HQ–OAR–2009–0234–20275.

[11] See 40 CFR 63.10005(h).

when compared to similar information obtained from EGUs without LEE status.

Upon initiation of first use of coal, residual oil, or solid oil-derived fuel, EGUs not using PM CEMS or PM CPMS as a compliance determination method or not meeting LEE status for PM or non-mercury HAP metals emissions for non-liquid oil-fired EGUs (or HAP metals emissions for liquid oil-fired EGUs) are also required to record hourly and report semi-annually the pre- and post-PM control device flow rates and temperatures, as well as fan amps. Moreover, the PM control device-specific parameters are required to be recorded hourly and reported semi-annually. The EGUs with ESPs are required to record the number of fields in service and the secondary current and voltage for each hour of startup and shutdown. The EGUs with FFs are required to record the number of compartments in service and the differential pressure across the baghouse. Finally, the EGUs with wet scrubbers that are necessary for filterable PM emission control will record scrubber liquid-to-flue gas ratios and scrubber liquid differential pressure for each hour of startup and shutdown.

Given that we do not have much information concerning continuous PM emissions or PM emission control devices during periods of startup, the final rule requires owners or operators of EGUs that choose to use definition (2) of ''startup'' contained in 40 CFR 63.10042 to provide a report prepared by an independent professional engineer that describes the EGU, PM emissions, and PM emissions control devices both as designed and in their current form. This information will show how each EGU is able, or has been modified, to meet the requirements of this rule. In addition, the information will specify the time needed to engage PM emission control devices from initial fuel combustion in the EGU; the effectiveness of each PM emission control device, both upon control device startup and at normal operation; the PM emission rate; and the uncontrolled PM emissions rate. The report will be submitted as part of the EGU's Notification of Compliance Status, and the information contained in the report will aid us in determining whether or not additional work practice requirements may be needed during startup periods to minimize HAP emissions.

Finally, the EPA acknowledges the comments asserting safety issues that must be considered during startup of PM controls (e.g., carbon monoxide buildup, fabric blinding). We believe that almost all EGUs will be able to alter their source through any number of means, including increasing clean fuel capacity and modifying APCD operation, and comply with the final work practice requirements; however, we recognize that there may be rare occasions that preclude a viable compliance option consistent with the final rule. Therefore, we are finalizing that an owner/operator may submit to the Administrator a request for an EGU-specific case-by-case emission standard consistent with 40 CFR 63.6(g). Such a request requires notice-and-comment rulemaking. Approval or disapproval authority for this type of request is delegated to the Assistant Administrator of the Office of Air and Radiation, and, for purposes of this rule, will be delegated no further.[12] However, the EPA will only consider requests that provide evidence of a documented manufacturer-identified safety issue and can provide proof that the PM control device is adequately designed and sized to meet the final PM emission limit. As identified in 40 CFR 63.10011(g)(4), in its request for the case-by-case determination, the owner/operator must provide, among other materials, documentation that: (1) The EGU is using clean fuels to the maximum extent possible to bring the EGU and PM control device up to the temperature necessary to alleviate or prevent the identified safety issues prior to the combustion of primary fuel in the EGU, (2) the EGU has explicitly followed the manufacturer's procedures to alleviate or prevent the identified safety issue, (3) the source provides details of the manufacturer's statement of concern, and (4) the source provides evidence that the PM control device is adequately designed and sized to meet the final PM emission limit. In addition, the source will have to indicate the other measures it will take to limit HAP emissions during startup periods and shutdown periods to ensure a control level consistent with the final work practice requirements. In order to ensure compliance with the work practice standards during startup periods, EGU owners or operators who request an alternative non-opacity emission standard shall comply with definition (1) of startup contained in 40 CFR 63.10042 (i.e., the definition contained in the final rule promulgated on February 12, 2012)[13] until the final alternative non-opacity emission standard is promulgated in the **Federal Register**.

We also proposed several revisions to the work practice standards issued in the final MATS rule in response to petitions on the final rule. Petitioners asserted that the final rule's work practice standards should include additional fuels as ''clean fuels'' and recognize operating limitations of certain EGU types and APCDs. Specifically, petitioners contended that the list of clean fuels required for use during startup in order to minimize emissions should include, among others, synthetic natural gas, synthesis gas (syngas), biodiesel, and ultra-low sulfur diesel (ULSD). The EPA has also been informed that propane is used to startup some EGUs.

In this final action, we are adding certain synthetic natural gas (that meets the specification necessary for that gas to be transported on a Federal Energy Regulatory Commission (FERC) regulated pipeline), synthesis gas that has been processed through a gas clean-up train such that it is suitable for use in the system's combustion turbine, and ULSD to the list of clean fuels. In addition, the EPA does see merit, as suggested by some commenters, of further broadening the definition of ''clean fuels.'' After reviewing other rules that use or require clean fuels, we believe that inclusion of those fuels meeting the requirements of 40 CFR Part 80, subpart I (''Subpart I—Motor Vehicle Diesel Fuel; Nonroad, Locomotive, and Marine Diesel Fuel; and ECA Marine Fuel'') is appropriate. Specifically, the definitions and provisions of 40 CFR 80.2, 80.501, 80.510, and 80.520 address sulfur content restrictions relating to distillate, diesel (including ULSD), and biodiesel fuels. The EPA believes that requiring use of clean fuels, including those we are adding in this final rule, for EGUs will significantly limit the HAP emissions from these sources during startup periods and shutdown periods. For example, information provided to the EPA on another rulemaking (found in Docket ID No. EPA–HQ–OAR–2008–0708–1459)[14] showed that the use of ULSD will significantly reduce emissions of air toxics, including metallic HAP (e.g., nickel, zinc, lead (Pb)) compared to the use of ''regular'' diesel. The EPA also believes that combustion of the other 40 CFR Part 80, subpart I, fuels meeting the subject definitions will cause significantly lower HAP emissions than

[12] See Delegation 7–121 and *Delegation of Authority under the Clean Air Act to Approve Alternatives to Test Methods and Procedures in Parts 60, 61, 63, and 65,* from Gina McCarthy to Stephen Page, September 30, 2011, in docket ID EPA–HQ–OAR–2009–0234.

[13] See 77 FR 9303; February 16, 2012.

[14] Email and attachments from Paul Miller, NESCAUM, to Melanie King, EPA. NESCAUM's RICE NESHAP comments. October 11, 2012, also found in Docket ID No. EPA–HQ–OAR–2009–0234.

coal and residual oil, and, as stated above, EGUs must use clean fuels to the maximum extent possible during startup periods and shutdown periods.

We are maintaining the work practice requirement in the final MATS that requires EGU source owners and operators, when firing coal, residual oil, or solid oil-derived fuel in the EGU during startup or shutdown, to vent emissions to the main stack(s) and operate all control devices necessary to meet all operating and emissions standards that are applicable to the source pursuant to other CAA or state requirements. In addition, any partial (fractional) operating hour that may occur at the beginning of a startup period or at the end of a shutdown period is to be flagged in reports as an hour of startup or shutdown.

For more discussion of each of these issues, please refer to the RTC, the TSD, and the memo ''Startup and shutdown provisions'' (Docket ID No. EPA–HQ–OAR–2009–0234–20224) in Docket ID No. EPA–HQ–OAR–2009–0234.

3. Treatment of IGCC EGU Syngas

The EPA is finalizing both the use of flares and the use of duct burners for integrated gasification combined cycle (IGCC) units to handle syngas not combusted in the turbine during startup periods and shutdown periods.

An IGCC EGU includes both a gasification unit and a combustion unit and syngas is generated in the gasifier for the primary purpose of being combusted in the associated combustion turbine. The EPA understands that, in some cases, the gasified fuel can be used for other purposes such as the production of chemicals (e.g., fertilizers, methanol) if the facility has been designed to do so. During the startup periods and shutdown periods, some or all of the syngas produced for the purpose of power production may not be combusted in the turbine. We proposed two options for IGCC EGUs for handling syngas not fired in the combustion turbine: (1) Syngas must be flared, not vented, or (2) syngas must be routed to duct burners, which may need to be installed, and the flue gas from the duct burners must be routed to the heat recovery steam generator. We solicited comments on the need to flare the unfired syngas, if it is more appropriate to require routing of the unfired syngas back into the system for all IGCC EGUs, and on the costs of adding duct burners, should they be required.

Industry commenters stated that it is important that flaring remain an option for routine startups and shutdowns for safety reasons and as a viable option for non-routine events such as EGU ''trips'' when the combustion turbine cannot combust syngas. Commenters noted that the flaring option is especially critical as the re-routing option can only be used by IGCC EGUs under limited circumstances as the syngas may lack sufficient pressure for re-injection and gasifiers are often once-through systems that do not support re-routing of the syngas. Commenters indicated that the actual flaring step of an IGCC startup is relatively short and ordinarily lasts less than 2 hours and that only clean syngas is flared during a routine startup.

The EPA is finalizing both options, use of flaring or duct burners, for handling of syngas not combusted in the turbine during startup periods and shutdown periods.[15] The EPA believes that the controls are comparable and that allowing the option will provide flexibility to owners/operators of IGCC EGUs to choose either of the options subject to operational constraints at their IGCC EGUs. The EPA believes it appropriate to cover gasifier syngas during startup periods and shutdown periods of the combustion turbine portion of the IGCC because the units are inextricably linked and the unused gas would not be generated but for the startup of the combustion portion of the IGCC unit. The EPA is requiring the use of either flares or duct burners to combust unused syngas during startup periods and shutdown periods.

4. Common Stacks

The final MATS rule at 40 CFR 63.10010(a)(1), (2), and (3) required owners or operators of EGUs with common stacks to either monitor the EGUs separately or monitor the common stack and assign the same emissions value to each EGU. No specific requirements concerning monitoring during startup periods or shutdown periods were given because the EPA believed the provisions as finalized were sufficient. Consistent with the monitoring provisions in the final rule, owners or operators of EGUs with common stacks are required to monitor and report emissions for compliance purposes at all times when any EGU using a common stack is operating in a non-startup/shutdown mode, even if another EGU using that common stack is in startup/shutdown mode. 40 CFR 63.10005(a)(2)(iii) reinforces and clarifies this requirement. Also, consistent with the final rule, work practice standards, rather than numeric emissions limits, apply during startup periods or shutdown periods, but only to EGUs in startup or shutdown mode. Today's reconsidered rule maintains the approach of the final rule. Owners or operators of EGUs with common stacks may either monitor each EGU separately upstream of the common stack or from the common stack. Monitoring must be operational (except for periods of monitor malfunction and during required quality assurance (QA) and maintenance activities) at all times that any fuel is being combusted, and compliance with numeric emission limits is required except for periods when all EGUs sharing the common stack are in startup or shutdown mode. Should an owner or operator choose to monitor the common stack, then emissions obtained from the monitoring will be applied to each EGU that shares the stack. This approach remains consistent with the final rule, and is not expected to be problematic emissions-wise for any EGU using a common stack, because the EGUs in startup periods or shutdown periods are required to use clean fuels and comply with the other work practice requirements. In addition, the EGUs sharing the common stack and operating in a mode other than startup or shutdown are required to operate such that they meet their emissions limits. We believe, based on evaluation of source compliance for many years, that sources generally operate in a manner to ensure a compliance margin to avoid potential exceedances.[16] Thus, we maintain the monitoring options available in the final rule are sufficient to address concerns from commenters.

As discussed below, the EPA is also establishing a default electrical load of 5 percent of the maximum sustainable electrical load of the EGU. This default value will be allowed to be used during periods of startup or periods of shutdown when the electrical load is zero. For EGUs sharing a common stack with just one common monitoring system, this default value will be available only when the electrical load is zero for an EGU sharing the common stack that is in a period of startup or shutdown. As soon as a non-zero electrical load is produced, that non-zero load must be used in electrical output-based emission rate calculations for each EGU in a startup or shutdown period, even if the load is less than 5 percent of capacity. Note that the electrical load of all EGUs in operation and sharing a common stack with just

[15] IGCC units that are also designed to co-produce chemicals or other products using syngas may also choose to use the unburned syngas in that process.

[16] ''. . . (S)ources do not design to meet a standard, but rather to meet a level comfortably lower. They do so in order to provide a compliance margin on those days where emissions rise due to inherent and uncontrollable variability . . .'' See 77 FR 42386; July 18, 2012.

one common monitoring system are to be summed when electrical output-based emission rate calculations are made.

Section 1.2.5 of the RTC contains both a summary of comments received on this topic and the EPA's response to those comments.

5. Diluent Cap

Apart from allowing use of a diluent cap when calculating Hg emissions during startup periods or shutdown periods, the final rule contained no allowance for use of a diluent cap. The November 2012 proposal sought comment on the need for a diluent cap for other HAP emissions during startup periods and shutdown periods. Use of a diluent cap can be important during startup periods and shutdown periods because CEMS values can approach infinity because the denominator in the calculations for CEMS values can approach zero during those periods. Moreover, use of a diluent cap becomes a common stack issue when one or more of the EGUs is in a startup or shutdown mode and just one monitoring instrument is used in the stack.

The EPA considered each comment and decided to allow use of default carbon dioxide (CO_2) or oxygen (O_2) values as identified in Section 3.3.4.1 of Appendix F of 40 CFR part 75, but only for startup periods or shutdown periods when CO_2 values are below or O_2 values are above default values for use in all pollutant calculations. For non-IGCC EGUs, the default CO_2 value is 5 percent and the default O_2 value is 14 percent. This means that when CEMS CO_2 measurements are below 5 percent, EGU owners or operators are allowed to use 5 percent CO_2 in their calculations. Because the startup analysis showed that CEMS CO_2 measurements exceeded default values within 2 hours of generation, the EPA does not expect to find default values being used when startup periods end. Likewise, when CEMS O_2 measurements are larger than 14 percent, EGU owners or operators will be able to use 14-percent O_2 in their calculations. IGCC EGUs will be allowed to use 1 percent as a default CO_2 value or 19 percent as a default O_2 value. As mentioned earlier, default diluent gas values will be allowed for use in calculations for startup periods or shutdown periods when CO_2 CEMS values are below or O_2 CEMS values are above default values. The rule requires EGU owners or operators to use actual CO_2 or O_2 CEMS values for all other operating periods. Although the EPA has no specific data or information concerning emissions during transient events outside startup or shutdown periods, the EPA expects the short duration of these transient events outside startup or shutdown periods that could cause CO_2 or O_2 CEMS to be below (or above) default values to have little, if any, impact on the 30-boiler operating day rolling averages.

The rule retains the requirement for EGU owners or operators to report instrumental CEMS, PM CPMS, and sorbent trap information, as well as flow rate information during startup periods or shutdown periods. Such information may prove useful in assessing potential emissions or operational limits in future rulemaking activities. Finally, the rule requires EGU owners or operators to identify each hour of startup or shutdown in which a diluent cap value is used.

Section 5.1 of the RTC contains both a summary of comments received on this topic and the EPA's response.

6. Default Electrical Output

The final rule provided no allowance regarding default electrical output. The November 2012 proposal sought comment on the need for a default electrical output for those owners or operators who choose to comply with a mass per electrical output standard. Use of a default electrical output cap can be important during startup periods and shutdown periods because the calculated mass per electrical output values can approach infinity when the electrical output is zero during those periods.

Upon consideration of the comments, the rule will provide a default electrical load value that EGU owners or operators will be allowed to use during startup periods or shutdown periods to calculate emissions rates for an EGU, as long as the electrical load for the EGU is zero. Once the EGU begins generating electricity, the source must use the actual electrical output in compliance calculations, even if the output is below the 5 percent default value. Moreover, use of a default electrical load is not allowed during periods other than startup or shutdown. As suggested by one commenter, the default electrical load will be equivalent to 5 percent of the maximum sustainable electrical output in megawatts of an EGU, as defined in section 6.5.2.1(a)(1) of appendix A to part 75, and included in an EGU's Part 75 electronic monitoring plan. This maximum sustainable load is either the nameplate capacity of the EGU or the highest electrical load observed in at least four representative quarters of EGU operation. When used in a common stack application, the default electrical load is 5 percent of the combined maximum sustainable electrical load of the EGUs that are in startup or shutdown mode during an hour in which the electrical load is zero. The default electrical load is allowed to be used in electrical output-based emission rate calculations (either pounds per megawatt-hour (lb/MWh) or pounds per gigawatt-hour (lb/GWh)) for any hour in which the actual electrical load for a single EGU or for every EGU venting to a common stack is zero. The EPA considered, but decided against, requiring measurement of thermal heat output and conversion back into equivalent electrical output; instead, the EPA decided to use a simpler approach based on already-existing requirements of the Acid Rain Program that we believe are most appropriate considering CAA section 112 and in light of the available data. Finally, the rule requires EGU owners or operators to identify each hour of startup or shutdown in which a default electrical load value is used.

Section 5.2 of the RTC contains both a summary of comments received on this topic and the EPA's response to significant comments.

7. Use of Sorbent Traps

The final rule required continuous Hg data collection using sorbent traps or Hg CEMS under all process operating conditions, including, but not limited to, startup periods and shutdown periods, over the entire 30 boiler operating day LEE qualification testing period. For sorbent traps, the EPA allowed use of redundant backup sorbent trap monitoring systems during startup periods and shutdown periods; and required operation of sorbent trap monitoring systems and collection of Hg data at all times EGUs operate, but did not allow use of Hg data collected during startup or shutdown periods to be included in compliance calculations.

After consideration of comments received on Hg monitoring during startup or shutdown periods using sorbent trap monitoring systems, the EPA decided that the final reconsidered rule will contain three alternative approaches for measuring Hg emissions during startup periods or shutdown periods. In the first approach, EGU owners or operators will continue to be able to use Hg CEMS for measuring Hg emissions.

The second approach relies on at least two separate sorbent monitoring systems. Although the rule has no prohibition against an EGU owner or operator using one sorbent trap monitoring system for compliance purposes during periods other than startup or shutdown and one (or more) sorbent trap monitoring systems for

startup periods or shutdown periods through the use of a non-redundant backup system (per section 2.2.2 of Appendix A to subpart UUUUU of Part 63), it will be clarified that two separate sorbent monitoring systems are allowed. Reliance on this second approach would address one commenter's concern that Hg compliance data could not be separated from Hg data collected during startup and/or shutdown periods when demonstrating compliance with numerical standards based on a sorbent trap system. When an EGU with at least two such systems (one for startup periods or shutdown periods and the other for all other periods) entered into a startup or shutdown period, the EGU owner or operator could switch monitoring systems either manually or automatically. As part of an EGU owner or operator's rubric for choosing which Hg measurement approach to use, the EGU owner or operator should take into account that any process operating hour for which quality assured Hg concentration data are not obtained is counted as an hour of monitoring system downtime, per section 1.4 of Appendix A to subpart UUUUU of Part 63. Therefore, if an EGU owner or operator believes change-out of sorbent monitoring traps may take too long, other approaches may be more suitable. An EGU owner or operator should carefully consider all costs—not only of sorbent tubes, analyses, and associated labor, but also of non-compliance due to data gaps, when determining whether this approach is appropriate.

The third approach, relying on just one sorbent trap monitoring system for all periods of operation (startup, shutdown, and normal), will be identified in the rule as a viable option for Hg monitoring, and, for EGU owners or operators who choose this option, the rule will allow data collected during startup or shutdown periods to be used for compliance purposes. The EPA expects little impact on Hg emissions during startup or shutdown periods, because, as explained above, we believe the rule contains sufficient variability to include startup and shutdown periods; clean fuels will be used during those periods; default diluent and electrical output values, which tend to constrain emissions, will be available for use; and emissions occurring during those periods will be included in a 30- (or 90-) boiler operating day rolling average. EGU owners or operators may find that this third approach would work well for those instances in which sudden and unpredictable shutdown events occur, for there would be no need to swap sorbent trap monitoring systems to capture shutdown emissions.

Finally, the EPA disagrees with commenters who claim that collecting data during startup and shutdown will serve no purpose relative to compliance with MATS and indicated that if the EPA needs to collect startup and shutdown data to better understand performance for a future rulemaking, that can be addressed through the information collection request (ICR) process where the EPA demonstrates the need and identifies a systematic plan to gather the data. As explained in the final rule preamble,[17] collection of startup and shutdown information will provide the EPA with information to more fully analyze the ability and appropriateness of establishing numeric emissions and operating limits during startup periods or shutdown periods so the issue can be addressed as part of the ongoing 8-year review of this rule. Collection of these data as part of the rule will also serve to reduce, if not eliminate, future ICR requests on this topic. The EPA also disagrees with commenters who wish to place all startup and shutdown information on those EGU owners or operators who choose to use Hg CEMS, for EPA remains interested in how well sorbent tube monitoring systems operate during startup periods or shutdown periods. Not collecting that information from those systems would leave a gap in the EPA's knowledge base.

Section 5.3 of the RTC contains both a summary of comments received on this topic and the EPA's response to significant comments.

V. Summary of Final Action and Changes Since Proposal—Utility NSPS

The current PM startup and shutdown requirements in the Utility NSPS are included in 40 CFR 60.42Da(e)(2) and require the owner/operator of an affected EGU to meet the work practice standards specified in Table 3 of 40 CFR Part 63, subpart UUUUU (i.e., the MATS rule). The Utility NSPS docket received a total of 23 public comments on the startup/shutdown reconsideration proposal. One of these comments was a duplicate. Of the remaining 22 comments, 15 were received in both dockets, and 7 were received in the Utility NSPS docket alone. Of the seven comments received in the Utility NSPS docket alone, four were said to be sent to the MATS docket, but no documents that matched the ones in the Utility NSPS docket were found in the MATS docket. However, the majority of the comments overlap with issues raised as part of the startup and shutdown provision included in MATS. The EPA responses to these issues are discussed in the MATS portion of the preamble and docket and have not been repeated here or in the Utility NSPS docket.

The sole NSPS-specific comment we received was that the Utility NSPS should include a definition of startup and shutdown that is consistent with the MATS definition and that the definitions of startup and shutdown in the Utility NSPS, MATS, and Industrial Boiler NESHAP (subpart DDDDD) rules should be consistent. There are situations where a facility is subject to the PM standard under 40 CFR Part 60, subpart Da, but is not subject to MATS (e.g., a biomass-fired EGU with natural gas burners >250 million British thermal units per hour). This facility would, therefore, be subject to the Industrial Boiler NESHAP. We have concluded that it is appropriate for industrial boilers and EGUs to have the same PM startup and shutdown work practice standards for both the NSPS and MATS. Therefore, we are amending 40 CFR 60.42Da(e)(2) so that owners or operators of facilities subject to 40 CFR Part 63, subpart UUUUU, shall meet the work practice standards specified in Table 3 to Subpart UUUUU of Part 63, and owners or operators of facilities subject to 40 CFR Part 63, subpart DDDDD, shall meet the work practice standards specified in Table 3 to Subpart DDDDD of Part 63.

We are also amending the regulatory text in the Utility NSPS to incorporate the relevant startup and shutdown definitions. We have concluded that the amended regulatory text is sufficient, and adding definitions of startup and shutdown are not necessary for the Utility NSPS. Using this approach is beneficial because any future amendments to the MATS startup and shutdown provisions will automatically be incorporated into the Utility NSPS.

VI. Impacts of This Final Rule

A. Summary of Emissions Impacts, Costs and Benefits

Because this final rule is no more stringent than the February 2012 final rule, we expect no additional costs or benefits associated with these revisions.

B. What are the air impacts?

This final rule is no more stringent than the February 2012 final rule. Accordingly, we believe that this final action will not result in significant changes in emissions of any of the regulated pollutants.

[17] See 77 FR 9382 (February 16, 2012).

C. What are the energy impacts?

This final action is not anticipated to have an effect on the supply, distribution, or use of energy. As previously stated, this final rule is no more stringent than the February 2012 final rule.

D. What are the compliance costs?

We believe there will be no significant change in compliance costs as a result of this final action because electric power companies would take the same or similar actions (e.g., operating control devices, recording clean fuel use, etc.) as they would have to comply with the previously finalized MATS standards. Moreover, we find no additional monitoring costs are necessary to comply with this final action because EGU owners or operators could continue to use the startup and shutdown provisions of the promulgated rule to demonstrate compliance; however, as in any other rule, EGU owners or operators may choose to conduct additional monitoring (and incur its expense) for their own purposes.

E. What are the economic and employment impacts?

Because we expect that electric power companies would take the same or similar actions to meet the requirements finalized in this action as they would have chosen to comply with the previously finalized MATS standards, we do not anticipate that this final action will result in significant changes in emissions, energy impacts, costs, benefits, or economic impacts. Likewise, we believe this action will not have any impacts on the price of electricity, employment or labor markets, or the U.S. economy.

F. What are the benefits of the final standards?

As previously stated, we do not anticipate any significant emission changes resulting from this action. Therefore, there are no direct monetized benefits or disbenefits associated with this action.

VII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a ''significant regulatory action'' under the terms of Executive Order 12866 (58 FR 51735; October 4, 1993) and is, therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821; January 21, 2011).

Because this final rule is no more stringent than the February 2012 final rule, we do not expect any additional costs, benefits, or economic impacts associated with these revisions. The EPA prepared an analysis of the potential costs and benefits associated with the 2012 final rule. This analysis is contained in the ''Economic Impact Analysis for the Final Reconsideration of the Mercury and Air Toxics Standards'' found in Docket ID No. EPA–HQ–OAR–2009–0234.

B. Paperwork Reduction Act

This action does not impose any new information collection burden. This action clarifies but does not change the information collection requirements previously finalized and, as a result, does not impose any additional burden on industry. However, the Office of Management and Budget (OMB) has previously approved the information collection requirements contained in the existing regulations (see 77 FR 9304) under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* and has assigned OMB control number 2060–0567. The OMB control numbers for EPA's regulations are listed in 40 CFR part 9.

C. Regulatory Flexibility Act

The Regulatory Flexibility Act generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this action on small entities, a small entity is defined as: (1) A small business as defined by the Small Business Administration's (SBA) regulations at 13 CFR 121.201; (2) a small governmental jurisdiction that is a government of a city, county, town, school district, or special district with a population of less that 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field. Categories and entities potentially regulated by the final rule with applicable NAICS codes are provided in section I.A of this preamble.

According to the SBA size standards for NAICS code 221122, Utilities—Fossil Fuel Electric Power Generation, a firm is small if, including its affiliates, it is primarily engaged in the generation, transmission, and/or distribution of electric energy for sale and its total electric output for the preceding fiscal year did not exceed 4 million MWh.

After considering the economic impacts of this final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities.

The EPA has determined that none of the small entities will experience a significant impact because the action imposes no additional regulatory requirements on owners or operators of affected sources.

D. Unfunded Mandates Reform Act

This action contains no federal mandates under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531–1538 for state, local, or tribal governments or the private sector. The action imposes no enforceable duty on any state, local, or tribal governments or the private sector. Therefore, this action is not subject to the requirements of UMRA sections 202 or 205.

This action is also not subject to the requirements of UMRA section 203 because it contains no regulatory requirements that might significantly or uniquely affect small governments. This action contains no requirements that apply to such governments or impose obligations upon them.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects 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, as specified in Executive Order 13132. Thus, Executive Order 13132 does not apply to this action.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175 (65 FR 67249; November 9, 2000). It will not have substantial direct effects on tribal governments, on the relationship between the federal government and Indian tribes, or on the distribution of power and responsibilities between the federal government and Indian tribes, as specified in Executive Order 13175. No affected facilities are owned or operated by Indian tribal governments. Thus,

Executive Order 13175 does not apply to this action.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 (62 FR 19885; April 23, 1997) because it is not economically significant as defined in Executive Order 12866. The EPA has evaluated the environmental health or safety effects of the final MATS on children. The results of the evaluation are discussed in that final rule (77 FR 9304; February 16, 2012) and are contained in Docket ID No. EPA–HQ–OAR–2009–0234.

H. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211 (66 FR 28355; May 22, 2001) because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (NTTAA); Public Law 104–113, 12(d) (15 U.S.C. 272 note) directs the EPA to use voluntary consensus standards (VCS) in their regulatory and procurement activities unless to do so would be inconsistent with applicable law or otherwise impracticable. VCS are technical standards (e.g., material specifications, test methods, sampling procedures, and business practices) that are developed or adopted by VCS bodies. The NTTAA requires the EPA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable VCS.

This action does not involve VCS. Therefore, the EPA did not consider the use of any VCS.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

Executive Order 12898 (59 FR 7629; February 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

The EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority, low-income, or indigenous populations because it does not affect the level of protection provided to human health or the environment. The EPA has evaluated the environmental health or environmental effects of the final MATS on minority, low-income, or indigenous populations. The results of the evaluation are discussed in that final rule (77 FR 9304; February 16, 2012) and are contained in Docket ID No. EPA–HQ–OAR–2009–0234.

K. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 *et seq.*, as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. The EPA will submit a report containing this final rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the **Federal Register**. A major rule cannot take effect until 60 days after it is published in the **Federal Register**. This action is not a "major rule" as defined by 5 U.S.C. 804(2). This final rule will be effective on November 19, 2014.

List of Subjects

40 CFR Part 60

Environmental protection, Administrative practice and procedure, Air pollution control, Intergovernmental relations, Reporting and recordkeeping requirements.

40 CFR Part 63

Environmental protection, Administrative practice and procedure, Air pollution control, Hazardous substances, Intergovernmental relations, Reporting and recordkeeping requirements.

Dated: November 7, 2014.

Gina McCarthy,

Administrator.

For the reasons discussed in the preamble, the EPA amends 40 CFR parts 60 and 63 to read as follows:

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

■ 1. The authority citation for 40 CFR part 60 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

■ 2. Section 60.42Da is amended by revising paragraph (e)(2) to read as follows:

§ 60.42Da Standards for particulate matter (PM).

* * * * *

(e) * * *

(2) During startup periods and shutdown periods, owners or operators of facilities subject to subpart UUUUU of part 63 of this chapter shall meet the work practice standards specified in Table 3 to subpart UUUUU of part 63 and use the relevant definitions in § 63.10042, and owners or operators of facilities subject to subpart DDDDD of part 63 shall meet the work practice standards specified in Table 3 to subpart DDDDD of part 63 and use the relevant definition used in § 63.7575.

* * * * *

PART 63—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR SOURCE CATEGORIES

■ 3. The authority citation for 40 CFR part 63 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

■ 4. Section 63.10000 is amended by revising paragraph (c)(1)(vi) and adding paragraph (l) to read as follows:

§ 63.10000 What are my general requirements for complying with this subpart?

* * * * *

(c)(1) * * *

(vi) If your coal-fired or solid oil-derived fuel-fired EGU does not qualify as a LEE for Hg, you must demonstrate initial and continuous compliance through use of a Hg CEMS or a sorbent trap monitoring system, in accordance with appendix A to this subpart.

(A) You may choose to use separate sorbent trap monitoring systems to comply with this subpart: One sorbent trap monitoring system to demonstrate compliance with the numeric mercury emissions limit during periods other than startup or shutdown and the other sorbent trap monitoring system to report average mercury concentration during startup periods or shutdown periods.

(B) You may choose to use one sorbent trap monitoring system to demonstrate compliance with the mercury emissions limit at all times

(including startup periods and shutdown periods) and to report average mercury concentration. You must follow the startup or shutdown requirements that follow and as given in Table 3 to this subpart for each coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGU.

* * * * *

(l) On or before the date an EGU is subject to this subpart, you must install, certify, operate, maintain, and quality assure each monitoring system necessary for demonstrating compliance with the work practice standards for PM or non-mercury HAP metals during startup periods and shutdown periods. You must collect, record, report, and maintain data obtained from these monitoring systems during startup periods and shutdown periods.

■ 5. Section 63.10005 is amended by revising paragraph (a)(2) to read as follows:

§ 63.10005 What are my initial compliance requirements and by what date must I conduct them?

(a) * * *

(2) To demonstrate initial compliance using either a CMS that measures HAP concentrations directly (*i.e.,* an Hg, HCl, or HF CEMS, or a sorbent trap monitoring system) or an SO_2 or PM CEMS, the initial performance test consists of 30- (or, if emissions averaging for Hg is used, 90-) boiler operating days of data collected by the initial compliance demonstration date specified in § 63.9984(f) with the certified monitoring system. Pollutant emission rates measured during startup periods and shutdown period (as defined in § 63.10042) are not to be included in the compliance demonstration, except as otherwise provided in § 63.10000(c)(1)(vi)(B) and paragraph (a)(2)(iii) of this section.

(i) The 30- (or, if applicable, 90-) boiler operating day CMS performance test must demonstrate compliance with the applicable Hg, HCl, HF, PM, or SO_2 emissions limit in Table 1 or 2 to this subpart.

(ii) You must collect hourly data from auxiliary monitoring systems (i.e., stack gas flow rate, CO_2, O_2, or moisture, as applicable) during the performance test period, in order to convert the pollutant concentrations to units of the standard. If you choose to comply with an electrical output-based emission limit, you must also collect hourly electrical load data during the performance test period.

(iii) For a group of affected units that are in the same subcategory, are subject to the same emission standards, and share a common stack, if you elect to demonstrate compliance by monitoring emissions at the common stack, startup and shutdown emissions (if any) that occur during the 30-(or, if applicable, 90-) boiler operating day performance test must either be excluded from or included in the compliance demonstration as follows:

(A) If one of the units that shares the stack either starts up or shuts down at a time when none of the other units is operating, you must exclude all pollutant emission rates measured during the startup or shutdown period, unless you are using a sorbent trap monitoring system to measure Hg emissions and have elected to include startup and shutdown emissions in the compliance demonstrations;

(B) If all units that are currently operating are in the startup or shutdown mode, you must exclude all pollutant emission rates measured during the startup or shutdown period, unless you are using a sorbent trap monitoring system to measure Hg emissions and have elected to include startup and shutdown emissions in the compliance demonstrations; or

(C) If any unit starts up or shuts down at a time when another unit is operating, and the other unit is not in the startup or shutdown mode, you must include all pollutant emission rates measured during the startup or shutdown period in the compliance demonstrations.

* * * * *

■ 6. Section 63.10007 is amended by revising paragraph (a)(1), redesignating paragraph (f) as paragraph (g), and adding a new paragraph (f) to read as follows:

§ 63.10007 What methods and other procedures must I use for the performance tests?

(a) * * *

(1) If you use CEMS (Hg, HCl, SO_2, or other) to determine compliance with a 30- (or, if applicable, 90-) boiler operating day rolling average emission limit, you must collect quality- assured CEMS data for all unit operating conditions, including startup and shutdown (see § 63.10011(g) and Table 3 to this subpart), except as otherwise provided in § 63.10020(b). Emission rates determined during startup periods and shutdown periods (as defined in § 63.10042) are not to be included in the compliance determinations, except as otherwise provided in §§ 63.10000(c)(1)(vi)(B) and 63.10005(a)(2)(iii).

* * * * *

(f) If you elect to (or are required to) use CEMS to continuously monitor Hg, HCl, HF, SO_2, or PM emissions (or, if applicable, sorbent trap monitoring systems to continuously collect Hg emissions data), the following default values are available for use in the emission rate calculations during startup periods or shutdown periods (as defined in § 63.10042). For the purposes of this subpart, these default values are not considered to be substitute data.

(1) *Diluent cap values.* If you use CEMS (or, if applicable, sorbent trap monitoring systems) to comply with a heat input-based emission rate limit, you may use the following diluent cap values for a startup or shutdown hour in which the measured CO_2 concentration is below the cap value or the measured O_2 concentration is above the cap value:

(i) For an IGCC EGU, you may use 1% for CO_2 or 19% for O_2.

(ii) For all other EGUs, you may use 5% for CO_2 or 14% for O_2.

(2) *Default electrical load.* If you use CEMS to continuously monitor Hg, HCl, HF, SO_2, or PM emissions (or, if applicable, sorbent trap monitoring systems to continuously collect Hg emissions data), the following default value is available for use in the emission rate calculations during startup periods or shutdown periods (as defined in § 63.10042). For the purposes of this subpart, this default value is not considered to be substitute data. For a startup or shutdown hour in which there is heat input to an affected EGU but zero electrical load, you must calculate the pollutant emission rate using a value equivalent to 5% of the maximum sustainable electrical output, expressed in megawatts, as defined in section 6.5.2.1(a)(1) of Appendix A to part 75 of this chapter. This default electrical load is either the nameplate capacity of the EGU or the highest electrical load observed in at least four representative quarters of EGU operation. For a monitored common stack, the default electrical load is used only when all EGUs are operating (i.e., combusting fuel) are in startup or shutdown mode, and have zero electrical generation. Under those conditions, a default electrical load equal to 5% of the combined maximum sustainable electrical load of the EGUs that are operating but have a total of zero electrical load must be used to calculate the hourly electrical output-based pollutant emissions rate.

* * * * *

■ 7. Section 63.10010 is amended by revising paragraph (f)(4) and adding paragraph (l) to read as follows:

§ 63.10010 What are my monitoring, installation, operation, and maintenance requirements?

* * * * *

(f) * * *

(4) Use only unadjusted, quality-assured SO_2 concentration values in the emissions calculations; do not apply bias adjustment factors to the part 75 SO_2 data and do not use part 75 substitute data values. For startup or shutdown hours (as defined in § 63.10042) the default electrical load and the diluent cap are available for use in the hourly SO_2 emission rate calculations, as described in § 63.10007(f). Use a flag to identify each startup or shutdown hour and report a special code if the diluent cap or default electrical load is used to calculate the SO_2 emission rate for any of these hours.

* * * * *

(l) You must install, certify, operate, maintain, and quality assure each monitoring system necessary for demonstrating compliance with the PM or non-mercury metals work practice standards for startup periods.

(1) You shall develop a site-specific monitoring plan for PM or non-mercury metals work practice monitoring during startup periods.

(2) You shall submit the site-specific monitoring plan upon request by the Administrator.

(3) The provisions of the monitoring plan must address the following items:

(i) Monitoring system installation;

(ii) Performance and equipment specifications;

(iii) Schedule for initial and periodic performance evaluations;

(iv) Performance evaluation procedures and acceptance criteria;

(v) On-going operation and maintenance procedures; and

(vi) On-going recordkeeping and reporting procedures.

(4) You may rely on monitoring system specifications or instructions to address paragraphs (l)(3)(i) through (vi) of this section.

(5) You must operate and maintain the monitoring system according to the site-specific monitoring plan.

■ 8. Section 63.10011 is amended by revising paragraph (g) to read as follows:

§ 63.10011 How do I demonstrate initial compliance with the emission limits and work practice standards?

* * * * *

(g) You must follow the startup or shutdown requirements as given in Table 3 to this subpart for each coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGU.

(1) You may use the diluent cap and default electrical load values, as described in § 63.10007(f), during startup periods or shutdown periods.

(2) You must operate all CMS, collect data, calculate pollutant emission rates, and record data during startup periods or shutdown periods.

(3) You must report the information as required in § 63.10031.

(4) If you choose to use paragraph (2) of the definition of ''startup'' in § 63.10042 and you find that you are unable to safely engage and operate your particulate matter (PM) control(s) within 1 hour of first firing of coal, residual oil, or solid oil-derived fuel, you may choose to rely on paragraph (1) of definition of ''startup'' in § 63.10042 or you may submit a request to use an alternative non-opacity emissions standard, as described below.

(i) As mentioned in § 63.6(g)(1), the request will be published in the **Federal Register** for notice and comment rulemaking. Until promulgation in the **Federal Register** of the final alternative non-opacity emission standard, you shall comply with paragraph (1) of the definition of ''startup'' in § 63.10042. You shall not implement the alternative non-opacity emissions standard until promulgation in the **Federal Register** of the final alternative non-opacity emission standard.

(ii) The request need not address the items contained in § 63.6(g)(2).

(iii) The request shall provide evidence of a documented manufacturer-identified safely issue.

(iv) The request shall provide information to document that the PM control device is adequately designed and sized to meet the PM emission limit applicable to the EGU.

(v) In addition, the request shall contain documentation that:

(A) The EGU is using clean fuels to the maximum extent possible to bring the EGU and PM control device up to the temperature necessary to alleviate or prevent the identified safety issues prior to the combustion of primary fuel in the EGU;

(B) The EGU has explicitly followed the manufacturer's procedures to alleviate or prevent the identified safety issue; and

(C) Identifies with specificity the details of the manufacturer's statement of concern.

(vi) The request shall specify the other work practice standards the EGU owner or operator will take to limit HAP emissions during startup periods and shutdown periods to ensure a control level consistent with the work practice standards of the final rule.

(vii) You must comply with all other work practice requirements, including but not limited to data collection, recordkeeping, and reporting requirements.

■ 9. Section 63.10020 is amended by revising paragraph (c) and adding paragraph (e) to read as follows:

§ 63.10020 How do I monitor and collect data to demonstrate continuous compliance?

* * * * *

(c) You may not use data recorded during EGU startup or shutdown in calculations used to report emissions, except as otherwise provided in §§ 63.10000(c)(1)(vi)(B) and 63.10005(a)(2)(iii). In addition, data recorded during monitoring system malfunctions or monitoring system out-of-control periods, repairs associated with monitoring system malfunctions or monitoring system out-of-control periods, or required monitoring system quality assurance or control activities may not be used in calculations used to report emissions or operating levels. You must use all of the quality-assured data collected during all other periods in assessing the operation of the control device and associated control system.

* * * * *

(e) Additional requirements during startup periods or shutdown periods.

(1) During each period of startup, you must record for each EGU:

(i) The date and time that clean fuels being combusted for the purpose of startup begins;

(ii) The quantity and heat input of clean fuel for each hour of startup;

(iii) The electrical load for each hour of startup;

(iv) The date and time that non-clean fuel combustion begins; and

(v) The date and time that clean fuels being combusted for the purpose of startup ends.

(2) During each period of shutdown, you must record for each EGU:

(i) The date and time that clean fuels being combusted for the purpose of shutdown begins;

(ii) The quantity and heat input of clean fuel for each hour of shutdown;

(iii) The electrical load for each hour of shutdown;

(iv) The date and time that non-clean fuel combustion ends; and

(v) The date and time that clean fuels being combusted for the purpose of shutdown ends.

(3) For PM or non-mercury HAP metals work practice monitoring during startup periods, you must monitor and collect data according to this section and the site-specific monitoring plan required by § 63.10011(l).

(i) Except for an EGU that uses PM CEMS or PM CPMS to demonstrate compliance with the PM emissions limit or that has LEE status for filterable PM or total non-Hg HAP metals for non-

liquid oil-fired EGUs (or HAP metals emissions for liquid oil-fired EGUs), or individual non-mercury metals CEMS you must:

(A) Record temperature and flow rate of post-combustion (exhaust) gas and amperage of forced draft fan(s) upstream of each filterable PM control device during each hour of startup.

(B) Record temperature and flow rate of exhaust gas and amperage of induced draft fan(s) downstream of each filterable control device during each hour of startup.

(C) For an EGU with an electrostatic precipitator, record the number of fields in service, as well as each field's secondary voltage and secondary current during each hour of startup.

(D) For an EGU with a fabric filter, record the number of compartments in service, as well as the differential pressure across the baghouse during each hour of startup.

(E) For an EGU with a wet scrubber needed for filterable PM control, record the scrubber liquid to fuel ratio and the differential pressure of the liquid during each hour of startup.

(ii) [Reserved]

■ 10. Section 63.10021 is amended by revising paragraph (h) to read as follows:

§ 63.10021 How do I demonstrate continuous compliance with the emission limitations, operating limits, and work practice standards?

* * * * *

(h) You must follow the startup or shutdown requirements as given in Table 3 to this subpart for each coal-fired, liquid oil-fired, or solid oil-derived fuel-fired EGU.

(1) You may use the diluent cap and default electrical load values, as described in § 63.10007(f), during startup periods or shutdown periods.

(2) You must operate all CMS, collect data, calculate pollutant emission rates, and record data during startup periods or shutdown periods.

(3) You must report the information as required in § 63.10031.

(4) You may choose to submit an alternative non-opacity emission standard, in accordance with the requirements contained in § 63.10011(g)(4). Until promulgation in the **Federal Register** of the final alternative non-opacity emission standard, you shall comply with paragraph (1) of the definition of ''startup'' in § 63.10042.

* * * * *

■ 11. Section 63.10022 is amended by revising the introductory text of paragraph (a) and adding paragraph (a)(4) to read as follows:

§ 63.10022 How do I demonstrate continuous compliance under the emissions averaging provision?

(a) Following the compliance date, the owner or operator must demonstrate compliance with this subpart on a continuous basis by meeting the requirements of paragraphs (a)(1) through (4) of this section.

* * * * *

(4) For each existing EGU participating in the emissions averaging option, operate in accordance with the startup or shutdown work practice requirements given in Table 3 to this subpart.

* * * * *

■ 12. Section 63.10030 is amended by revising the introductory text of paragraph (e) and adding paragraph (e)(8) to read as follows:

§ 63.10030 What notifications must I submit and when?

* * * * *

(e) When you are required to conduct an initial compliance demonstration as specified in § 63.10011(a), you must submit a Notification of Compliance Status according to § 63.9(h)(2)(ii). The Notification of Compliance Status report must contain all the information specified in paragraphs (e)(1) through (8) of this section, as applicable.

* * * * *

(8) Identification of whether you plan to rely on paragraph (1) or (2) of the definition of ''startup'' in § 63.10042.

(i) Should you choose to rely on paragraph (2) of the definition of ''startup'' in § 63.10042 for your EGU, you shall include a report that identifies:

(A) The original EGU installation date;

(B) The original EGU design characteristics, including, but not limited to, fuel and PM controls;

(C) Each design PM control device efficiency;

(D) The design PM emission rate from the EGU in terms of pounds PM per MMBtu and pounds PM per hour;

(E) The design time from start of fuel combustion to necessary conditions for each PM control device startup;

(F) Each design PM control device efficiency upon startup of the PM control device;

(G) The design EGU uncontrolled PM emission rate in terms of pounds PM per hour;

(H) Each change from the original design that did or could have changed PM emissions, including, but not limited to, each different fuel mix, each revision to each PM control device, and each EGU revision, along with the month and year that the change occurred;

(I) Current EGU PM producing characteristics, including, but not limited to, fuel mix and PM controls;

(J) Current PM emission rate from the EGU in terms of pounds PM per MMBtu and pounds per hour;

(K) Current PM control device efficiency from each PM control device;

(L) Current time from start of fuel combustion to conditions necessary for each PM control device startup;

(M) Current PM control device efficiency upon startup of each PM control device; and

(N) Current EGU uncontrolled PM emission rate in terms of pounds PM per hour.

(ii) The report shall be prepared, signed, and sealed by a professional engineer licensed in the state where your EGU is located. Apart from preparing, signing, and sealing this report, the professional engineer shall be independent and not otherwise employed by your company, any parent company of your company, or any subsidiary of your company.

■ 13. Section 63.10031 is amended by revising the introductory text of paragraph (c) and adding paragraph (c)(5) to read as follows:

§ 63.10031 What reports must I submit and when?

* * * * *

(c) The compliance report must contain the information required in paragraphs (c)(1) through (5) of this section.

* * * * *

(5) For each instance of startup or shutdown:

(i) Include the maximum clean fuel storage capacity and the maximum hourly heat input that can be provided for each clean fuel determined according to the requirements of § 63.10032(f).

(ii) Include the information required to be monitored, collected, or recorded according to the requirements of § 63.10020(e).

(iii) If you choose to use CEMS for compliance purposes, include hourly average CEMS values and hourly average flow rates. Use units of milligrams per cubic meter for PM CEMS, micrograms per cubic meter for Hg CEMS, and ppmv for HCl, HF, or SO_2 CEMS. Use units of standard cubic meters per hour on a wet basis for flow rates.

(iv) If you choose to use a separate sorbent trap measurement system for startup or shutdown reporting periods, include hourly average mercury

concentration in terms of micrograms per cubic meter.

(v) If you choose to use a PM CPMS, include hourly average operating parameter values in terms of the operating limit, as well as the operating parameter to PM correlation equation.

* * * * *

■ 14. Section 63.10032 is amended by revising paragraph (f) to read as follows:

§ 63.10032 What records must I keep?

* * * * *

(f) Regarding startup periods or shutdown periods:

(1) You must keep records of the occurrence and duration of each startup or shutdown;

(2) You must keep records of the determination of the maximum clean fuel capacity for each EGU;

(3) You must keep records of the determination of the maximum hourly clean fuel heat input and of the hourly clean fuel heat input for each EGU; and

(4) You must keep records of the information required in § 63.10020(e).

* * * * *

■ 15. In § 63.10042:

■ a. Revise the definitions for ''Boiler operating day,'' ''Shutdown'', and ''Startup''; and

■ b. Add in alphabetical order new definitions for ''Clean fuel,'' ''Default electrical load,'' and ''Diluent cap.''

The revisions and additions read as follows:

§ 63.10042 What definitions apply to this subpart?

* * * * *

Boiler operating day means a 24-hour period that begins at midnight and ends the following midnight during which any fuel is combusted at any time in the EGU, excluding startup periods or shutdown periods. It is not necessary for the fuel to be combusted the entire 24-hour period.

* * * * *

Clean fuel means natural gas, synthetic natural gas that meets the specification necessary for that gas to be transported on a Federal Energy Regulatory Commission (FERC) regulated pipeline, propane, distillate oil, synthesis gas that has been processed through a gas clean-up train such that it could be used in a system's combustion turbine, or ultra-low-sulfur diesel (ULSD) oil, including those fuels meeting the requirements of 40 CFR part 80, subpart I (''Subpart I—Motor Vehicle Diesel Fuel; Nonroad, Locomotive, and Marine Diesel Fuel; and ECA Marine Fuel'').

* * * * *

Default electrical load means an electrical load equal to 5 percent of the maximum sustainable electrical output (megawatts), as defined in section 6.5.2.1(a)(1) of Appendix A to part 75 of this chapter, of an affected EGU that is in startup or shutdown mode. For monitored common stack configurations, the default electrical load is 5 percent of the combined maximum sustainable electrical load of the EGUs that are in startup or shutdown mode during an hour in which the electrical load for all operating EGUs is zero. The default electrical load is used to calculate the electrical output-based emission rate (lb/MWh or lb/GWh, as applicable) for any startup or shutdown hour in which the actual electrical load is zero. The default electrical load is not used for EGUs required to make heat input-based emission rate (lb/MMBtu or lb/TBtu, as applicable) calculations. For the purposes of this subpart, the default electrical load is not considered to be a substitute data value.

* * * * *

Diluent cap means a default CO_2 or O_2 concentration that may be used to calculate the Hg, HCl, HF, or SO_2 emission rate (lb/MMBtu or lb/TBtu, as applicable) during a startup or shutdown hour in which the measured CO_2 concentration is below the cap value or the measured O_2 concentration is above the cap value. The appropriate diluent cap values for EGUs are presented in § 63.10007(f) and in section 6.2.1.2 of Appendix A to this subpart. For the purposes of this subpart, the diluent cap is not considered to be a substitute data value.

* * * * *

Shutdown means the period in which cessation of operation of an EGU is initiated for any purpose. Shutdown begins when the EGU no longer generates electricity or makes useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes or when no coal, liquid oil, syngas, or solid oil-derived fuel is being fired in the EGU, whichever is earlier. Shutdown ends when the EGU no longer generates electricity or makes useful thermal energy (such as steam or heat) for industrial, commercial, heating, or cooling purposes, and no fuel is being fired in the EGU. Any fraction of an hour in which shutdown occurs constitutes a full hour of shutdown.

Startup means:

(1) Either the first-ever firing of fuel in a boiler for the purpose of producing electricity, or the firing of fuel in a boiler after a shutdown event for any purpose. Startup ends when any of the steam from the boiler is used to generate electricity for sale over the grid or for any other purpose (including on-site use). Any fraction of an hour in which startup occurs constitutes a full hour of startup; or

(2) The period in which operation of an EGU is initiated for any purpose. Startup begins with either the firing of any fuel in an EGU for the purpose of producing electricity or useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes (other than the first-ever firing of fuel in a boiler following construction of the boiler) or for any other purpose after a shutdown event. Startup ends 4 hours after the EGU generates electricity that is sold or used for any other purpose (including on site use), or 4 hours after the EGU makes useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes (16 U.S.C. 796(18)(A) and 18 CFR 292.202(c)), whichever is earlier. Any fraction of an hour in which startup occurs constitutes a full hour of startup.

* * * * *

■ 16. Revise Table 3 to subpart UUUUU of part 63 to read as follows:

TABLE 3 TO SUBPART UUUUU OF PART 63—WORK PRACTICE STANDARDS

[As stated in § 63.9991, you must comply with the following applicable work practice standards:]

If your EGU is . . .	You must meet the following . . .
1. An existing EGU	Conduct a tune-up of the EGU burner and combustion controls at least each 36 calendar months, or each 48 calendar months if neural network combustion optimization software is employed, as specified in § 63.10021(e).
2. A new or reconstructed EGU	Conduct a tune-up of the EGU burner and combustion controls at least each 36 calendar months, or each 48 calendar months if neural network combustion optimization software is employed, as specified in § 63.10021(e).

TABLE 3 TO SUBPART UUUUU OF PART 63—WORK PRACTICE STANDARDS—Continued

[As stated in § 63.9991, you must comply with the following applicable work practice standards:]

If your EGU is . . .	You must meet the following . . .
3. A coal-fired, liquid oil-fired (excluding limited-use liquid oil-fired subcategory units), or solid oil-derived fuel-fired EGU during startup.	You have the option of complying using either of the following work practice standards. (1) If you choose to comply using paragraph (1) of the definition of "startup" in § 63.10042, you must operate all CMS during startup. Startup means either the first-ever firing of fuel in a boiler for the purpose of producing electricity, or the firing of fuel in a boiler after a shutdown event for any purpose. Startup ends when any of the steam from the boiler is used to generate electricity for sale over the grid or for any other purpose (including on site use). For startup of a unit, you must use clean fuels as defined in § 63.10042 for ignition. Once you convert to firing coal, residual oil, or solid oil-derived fuel, you must engage all of the applicable control technologies except dry scrubber and SCR. You must start your dry scrubber and SCR systems, if present, appropriately to comply with relevant standards applicable during normal operation. You must comply with all applicable emissions limits at all times except for periods that meet the applicable definitions of startup and shutdown in this subpart. You must keep records during startup periods. You must provide reports concerning activities and startup periods, as specified in § 63.10011(g) and § 63.10021(h) and (i). (2) If you choose to comply using paragraph (2) of the definition of "startup" in § 63.10042, you must operate all CMS during startup. You must also collect appropriate data, and you must calculate the pollutant emission rate for each hour of startup. For startup of an EGU, you must use one or a combination of the clean fuels defined in § 63.10042 to the maximum extent possible throughout the startup period. You must have sufficient clean fuel capacity to engage and operate your PM control device within one hour of adding coal, residual oil, or solid oil-derived fuel to the unit. You must meet the startup period work practice requirements as identified in § 63.10020(e). Once you start firing coal, residual oil, or solid oil-derived fuel, you must vent emissions to the main stack(s). You must comply with the applicable emission limits within 4 hours of start of electricity generation. You must engage and operate your particulate matter control(s) within 1 hour of first firing of coal, residual oil, or solid oil-derived fuel. You must start all other applicable control devices as expeditiously as possible, considering safety and manufacturer/supplier recommendations, but, in any case, when necessary to comply with other standards made applicable to the EGU by a permit limit or a rule other than this Subpart that require operation of the control devices. Relative to the syngas not fired in the combustion turbine of an IGCC EGU during startup, you must either: (1) flare the syngas, or (2) route the syngas to duct burners, which may need to be installed, and route the flue gas from the duct burners to the heat recovery steam generator. If you choose to use just one set of sorbent traps to demonstrate compliance with Hg emission limits, you must comply with all applicable Hg emission limits at all times; otherwise, you must comply with all applicable emission limits at all times except for startup or shutdown periods conforming to this practice. You must collect monitoring data during startup periods, as specified in § 63.10020(a) and (e). You must keep records during startup periods, as provided in §§ 63.10032 and 63.10021(h). Any fraction of an hour in which startup occurs constitutes a full hour of startup. You must provide reports concerning activities and startup periods, as specified in §§ 63.10011(g), 63.10021(i), and 63.10031.
4. A coal-fired, liquid oil-fired (excluding limited-use liquid oil-fired subcategory units), or solid oil-derived fuel-fired EGU during shutdown.	You must operate all CMS during shutdown. You must also collect appropriate data, and you must calculate the pollutant emission rate for each hour of shutdown. While firing coal, residual oil, or solid oil-derived fuel during shutdown, you must vent emissions to the main stack(s) and operate all applicable control devices and continue to operate those control devices after the cessation of coal, residual oil, or solid oil-derived fuel being fed into the EGU and for as long as possible thereafter considering operational and safety concerns. In any case, you must operate your controls when necessary to comply with other standards made applicable to the EGU by a permit limit or a rule other than this Subpart and that require operation of the control devices. If, in addition to the fuel used prior to initiation of shutdown, another fuel must be used to support the shutdown process, that additional fuel must be one or a combination of the clean fuels defined in § 63.10042 and must be used to the maximum extent possible. Relative to the syngas not fired in the combustion turbine of an IGCC EGU during shutdown, you must either: (1) flare the syngas, or (2) route the syngas to duct burners, which may need to be installed, and route the flue gas from the duct burners to the heat recovery steam generator. You must comply with all applicable emission limits at all times except during startup periods and shutdown periods at which time you must meet this work practice. You must collect monitoring data during shutdown periods, as specified in § 63.10020(a). You must keep records during shutdown periods, as provided in §§ 63.10032 and 63.10021(h). Any fraction of an hour in which shutdown occurs constitutes a full hour of shutdown. You must provide reports concerning activities and shutdown periods, as specified in §§ 63.10011(g), 63.10021(i), and 63.10031.

■ 17. Revise Table 9 to subpart UUUUU of part 63 to read as follows:

TABLE 9 TO SUBPART UUUUU OF PART 63—APPLICABILITY OF GENERAL PROVISIONS TO SUBPART UUUUU

[As stated in § 63.10040, you must comply with the applicable General Provisions according to the following]

Citation	Subject	Applies to subpart UUUUU
§ 63.1	Applicability	Yes.
§ 63.2	Definitions	Yes. Additional terms defined in § 63.10042.
§ 63.3	Units and Abbreviations	Yes.
§ 63.4	Prohibited Activities and Circumvention	Yes.
§ 63.5	Preconstruction Review and Notification Requirements.	Yes.
§ 63.6(a), (b)(1)–(5), (b)(7), (c), (f)(2)–(3), (h)(2)–(9), (i), (j).	Compliance with Standards and Maintenance Requirements.	Yes.
§ 63.6(e)(1)(i)	General Duty to minimize emissions	No. See § 63.10000(b) for general duty requirement.
§ 63.6(e)(1)(ii)	Requirement to correct malfunctions ASAP.	No.
§ 63.6(e)(3)	SSM Plan requirements	No.
§ 63.6(f)(1)	SSM exemption	No.
§ 63.6(h)(1)	SSM exemption	No.
§ 63.6(g)	Compliance with Standards and Maintenance Requirements, Use of an alternative non-opacity emission standard.	Yes. See §§ 63.10011(g)(4) and 63.10021(h)(4) for additional requirements.
§ 63.7(e)(1)	Performance testing	No. See § 63.10007.
§ 63.8	Monitoring Requirements	Yes.
§ 63.8(c)(1)(i)	General duty to minimize emissions and CMS operation.	No. See § 63.10000(b) for general duty requirement.
§ 63.8(c)(1)(iii)	Requirement to develop SSM Plan for CMS.	No.
§ 63.8(d)(3)	Written procedures for CMS	Yes, except for last sentence, which refers to an SSM plan. SSM plans are not required.
§ 63.9	Notification Requirements	Yes.
§ 63.10(a), (b)(1), (c), (d)(1)–(2), (e), and (f).	Recordkeeping and Reporting Requirements.	Yes, except for the requirements to submit written reports under § 63.10(e)(3)(v).
§ 63.10(b)(2)(i)	Recordkeeping of occurrence and duration of startups and shutdowns.	No.
§ 63.10(b)(2)(ii)	Recordkeeping of malfunctions	No. See § 63.10001 for recordkeeping of (1) occurrence and duration and (2) actions taken during malfunction.
§ 63.10(b)(2)(iii)	Maintenance records	Yes.
§ 63.10(b)(2)(iv)	Actions taken to minimize emissions during SSM.	No.
§ 63.10(b)(2)(v)	Actions taken to minimize emissions during SSM.	No.
§ 63.10(b)(2)(vi)	Recordkeeping for CMS malfunctions	Yes.
§ 63.10(b)(2)(vii)–(ix)	Other CMS requirements	Yes.
§ 63.10(b)(3), and (d)(3)–(5)		No.
§ 63.10(c)(7)	Additional recordkeeping requirements for CMS—identifying exceedances and excess emissions.	Yes.
§ 63.10(c)(8)	Additional recordkeeping requirements for CMS—identifying exceedances and excess emissions.	Yes.
§ 63.10(c)(10)	Recording nature and cause of malfunctions.	No. See § 63.10032(g) and (h) for malfunctions recordkeeping requirements.
§ 63.10(c)(11)	Recording corrective actions	No. See § 63.10032(g) and (h) for malfunctions recordkeeping requirements.
§ 63.10(c)(15)	Use of SSM Plan	No.
§ 63.10(d)(5)	SSM reports	No. See § 63.10021(h) and (i) for malfunction reporting requirements.
§ 63.11	Control Device Requirements	No.
§ 63.12	State Authority and Delegation	Yes.
§§ 63.13–63.16	Addresses, Incorporation by Reference, Availability of Information, Performance Track Provisions.	Yes.
§§ 63.1(a)(5), (a)(7)–(9), (b)(2), (c)(3)–(4), (d), 63.6(b)(6), (c)(3), (c)(4), (d), (e)(2), (e)(3)(ii), (h)(3), (h)(5)(iv), 63.8(a)(3), 63.9(b)(3), (h)(4), 63.10(c)(2)–(4), (c)(9).	Reserved	No.

■ 18. Appendix A to subpart UUUUU is amended by adding sections 7.1.2.5, 7.1.8.5, and 7.1.8.6, to read as follows:

Appendix A to Subpart UUUUU of Part 63—Hg Monitoring Provisions

* * * * *

7. Recordkeeping and Reporting

* * * * *

7.1.2 *Operating Parameter Records.* * * *

* * * * *

7.1.2.5 If applicable, a flag to indicate that the hour is a startup or shutdown hour (as defined in § 63.10042).

* * * * *

7.1.8 *Hg Emission Rate Records.* * * *

* * * * *

7.1.8.5 If applicable, a code to indicate that the default electrical load (as defined in § 63.10042) was used to calculate the Hg emission rate.

7.1.8.6 If applicable, a code to indicate that the diluent cap (as defined in § 63.10042) was used to calculate the Hg emission rate.

* * * * *

■ 19. Appendix B to subpart UUUUU is amended by revising section 9.3.1 and adding sections 10.1.2.5, 10.1.7.5, and 10.1.7.6 to read as follows:

Appendix B to Subpart UUUUU of Part 63—-HCl and HF Monitoring Provisions

* * * * *

9. Data Reduction and Calculations

* * * * *

9.3.1 For heat input-based emission rates, select an appropriate emission rate equation from among Equations 19–1 through 19–9 in EPA Method 19 in Appendix A–7 to part 60 of this chapter, to calculate the HCl or HF emission rate in lb/MMBtu. Multiply the HCl concentration value (ppm) by 9.43×10^{-8} to convert it to lb/scf, for use in the applicable Method 19 equation. For HF, the conversion constant from ppm to lb/scf is 5.18×10^{-8}. The appropriate diluent cap value from section 6.2.1.2 of Appendix A to this subpart may be used to calculate the HCl or HF emission rate (lb/MMBtu) during startup or shutdown hours.

* * * * *

10. Recordkeeping Requirements

* * * * *

10.1.2 *Operating Parameter Records.* * * *

* * * * *

10.1.2.5 If applicable, a flag to indicate that the hour is a startup or shutdown hour (as defined in § 63.10042).

* * * * *

10.1.7 *HCl and HF Emission Rate Records.* * * *

* * * * *

10.1.7.5 If applicable, a code to indicate that the default electrical load (as defined in § 63.10042) was used to calculate the HCl or HF emission rate.

10.1.7.6 If applicable, a code to indicate that the diluent cap (as defined in § 63.10042) was used to calculate the HCl or HF emission rate.

* * * * *

[FR Doc. 2014–27125 Filed 11–18–14; 8:45 am]

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 63

[EPA–HQ–OAR–2009–0234; FRL–9919–21–OAR]

RIN 2060–AS39

National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Steam Generating Units

AGENCY: Environmental Protection Agency.

ACTION: Direct final rule.

SUMMARY: The Environmental Protection Agency (EPA) is taking direct final action to amend the National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Steam Generating Units (Mercury and Air Toxics Standards (MATS)). This direct final rule amends the reporting requirements in the MATS rule by temporarily requiring affected sources to submit all required emissions and compliance reports to the EPA through the Emissions Collection and Monitoring Plan System (ECMPS) Client Tool and temporarily suspending the requirement for affected sources to submit certain reports using the Electronic Reporting Tool and the Compliance and Emissions Data Reporting Interface (CEDRI).

DATES: This rule is effective on January 5, 2015 without further notice, unless the EPA receives adverse comment by December 19, 2014. If the EPA receives adverse comment, we will publish a timely withdrawal in the **Federal Register** informing the public that some or all of the amendments in the final rule will not take effect.

ADDRESSES: *Comments.* Submit your comments, identified by Docket ID Number EPA–HQ–OAR–2009–0234, by one of the following methods:

- *http://www.regulations.gov:* Follow the on-line instructions for submitting comments.
- *Email: a-and-r-docket@epa.gov.* Attention Docket ID Number EPA–HQ–OAR–2009–0234.
- *Fax:* (202) 566–9744. Attention Docket ID Number EPA–HQ–OAR–2009–0234.
- *Mail:* U.S. Postal Service, send comments to: U.S. Environmental Protection Agency, EPA Docket Center, Mail Code: 28221T, Attention Docket ID Number EPA–HQ–OAR–2009–0234, 1200 Pennsylvania Ave. NW., Washington, DC 20460.
- *Hand Delivery:* U.S. Environmental Protection Agency, EPA Docket Center, Room 3334, EPA WJC West Building, 1301 Constitution Ave. NW., Washington, DC 20004. Attention Docket ID Number EPA–HQ–OAR–2009–0234. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions. Direct your comments to Docket ID Number EPA–HQ–OAR–2009–0234. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be confidential business information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or email. The *http://www.regulations.gov* Web site is an ''anonymous access'' system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *http://www.regulations.gov,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should not include special characters or any form of encryption and be free of any defects or viruses. For additional information

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Part III

Environmental Protection Agency

40 CFR Part 60

Oil and Natural Gas Sector: Reconsideration of Additional Provisions of New Source Performance Standards; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA–HQ–OAR–2010–0505; FRL–9921–03–OAR]

RIN 2060–AR75

Oil and Natural Gas Sector: Reconsideration of Additional Provisions of New Source Performance Standards

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: This action finalizes amendments to new source performance standards (NSPS) for the oil and natural gas sector. On August 16, 2012, the Environmental Protection Agency (EPA) published final NSPS for the oil and natural gas sector. The Administrator received petitions for administrative reconsideration of certain aspects of the standards. Among issues raised in the petitions were time-critical issues related to certain storage vessel provisions and well completion provisions. On July 17, 2014 (79 FR 41752), the EPA published proposed amendments and clarifications as a result of reconsideration of certain issues related to well completions, storage vessels and other issues raised for reconsideration as well as technical corrections and amendments to further clarify the rule. This action finalizes these amendments and corrects technical errors that were inadvertently included in the final standards.

DATES: This final rule is effective on December 31, 2014.

ADDRESSES: The EPA has established a docket for this action under Docket ID No. EPA–HQ–OAR–2010–0505. All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available, *e.g.,* confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy. Publicly available docket materials are available either electronically through *http://www.regulations.gov* or in hard copy at the EPA's Docket Center, Public Reading Room, EPA WJC West Building, Room Number 3334, 1301 Constitution Avenue NW., Washington, DC 20004. This docket facility is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: Mr. Bruce Moore, Sector Policies and Programs Division (E143–05), Office of Air Quality Planning and Standards, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number: (919) 541–5460; facsimile number: (919) 685–3200; email address: *moore.bruce@epa.gov.*

SUPPLEMENTARY INFORMATION: *Organization of This Document.* The information presented in this preamble is organized as follows:

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H. Executive Order 13211: Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution or Use
I. National Technology Transfer and Advancement Act (NTTAA)
J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
K. Congressional Review Act (CRA)

I. Preamble Acronyms and Abbreviations

Several acronyms and terms are included in this preamble. While this may not be an exhaustive list, to ease the reading of this preamble and for reference purposes, the following terms and acronyms are defined here:

CAA Clean Air Act
CFR Code of Federal Regulations
CO_2 Carbon Dioxide
EPA Environmental Protection Agency
LEL Lower Explosive Limit
NSPS New Source Performance Standards
NTTAA National Technology Transfer and Advancement Act
OAQPS Office of Air Quality Planning and Standards
OMB Office of Management and Budget
PTE Potential to Emit
psi Pounds per Square Inch
REC Reduced Emissions Completion
RFA Regulatory Flexibility Act
tpy Tons per Year
UMRA Unfunded Mandates Reform Act
VOC Volatile Organic Compounds
VRU Vapor Recovery Unit

II. General Information

A. Executive Summary

1. Purpose of This Regulatory Action

The purpose of this action is to finalize amendments to the 40 CFR part 60, subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution final rule promulgated under section 111(b) of the Clean Air Act (CAA), which was published on August 16, 2012 (77 FR 49490). Specifically, this final rule addresses certain issues related to well completion and storage vessel provisions that have been raised by different stakeholders through several administrative petitions for reconsideration of the 2012 NSPS and the 2013 storage vessel amendments to the NSPS. The EPA is amending the NSPS to address these issues. Proposed amendments were published on July 17, 2014. (79 FR 41752)

2. Summary of Major Amendments to the NSPS

We are amending the standards for gas well affected facilities to provide greater clarity concerning what owners and operators must do during well completion operations with respect to the handling of gas and liquids during the well completion operations. In this action, we clarify that the flowback

period of a well completion following hydraulic fracturing consists of two distinct stages, the ''initial flowback stage'' and the ''separation flowback stage.'' The initial flowback stage begins with the onset of flowback and ends when the flow is routed to a separator. During the initial flowback stage, any gas in the flowback is not subject to control. However, the operator must route the flowback to a separator unless it is technically infeasible for a separator to function. The point at which the separator can function marks the beginning of the separation flowback stage. During this stage, the operator must route all salable quality gas from the separator to a flow line or collection system, re-inject the gas into the well or another well, use the gas as an on-site fuel source or use the gas for another useful purpose. If it is infeasible to route the gas as described above, or if the gas is not of salable quality, the operator must combust the gas unless combustion creates a fire or safety hazard or can damage tundra, permafrost or waterways. No direct venting of gas is allowed during the separation flowback stage. The separation flowback stage ends either when the well is shut in and the flowback equipment is permanently disconnected from the well, or on startup of production. This also marks the end of the flowback period. The operator has a general duty to safely maximize resource recovery and minimize releases to the atmosphere over the duration of the flowback period. The operator is also required to document the stages of the completion operation by maintaining records of (1) the date and time of the onset of flowback; (2) the date and time of each attempt to route flowback to the separator; (3) the date and time of each occurrence in which the operator reverted to the initial flowback stage; (4) the date and time of well shut in; and (5) date and time that temporary flowback equipment is disconnected. The NSPS already requires that the operator document the total duration of venting, combustion and flaring over the flowback period. All flowback liquids during the initial flowback period and the separation flowback period must be routed to a well completion vessel, a storage vessel or a collection system. On startup of production, the operator must begin the 30-day process of estimating the volatile organic compound (VOC) potential to emit (PTE) for storage vessels that will receive the liquids from the well. If the PTE is at least 6 tons/yr (tpy), the operator must control emissions from the storage vessel no later than 60 days after the startup of production (for storage vessels used in applications other than production following well completions, the term used to identify this point in time is ''startup''). A well completion vessel to which liquids from the well are routed after startup of production for a period in excess of 60 days is considered a ''storage vessel'' subject to the storage vessel PTE determination and, if determined to be a storage vessel affected facility, would be subject to the control, cover and closed vent system requirements of the NSPS.

We are finalizing the definition of ''low pressure gas well,'' as presented in the 2012 NSPS and re-proposed in the July 17, 2014, proposed rule.

We are finalizing several amendments related to the storage vessel provisions of the NSPS. First, we are finalizing provisions for determining VOC PTE for storage vessels with vapor recovery to clarify that the provisions allowing sources to exclude emissions captured through vapor recovery if certain specified control requirements are met do not apply to storage vessels whose PTE is limited to below the 6 tpy applicability threshold under a legally and practically enforceable permit or other limitation under federal, state or tribal authority. We are also amending the storage vessel closed vent system and cover requirements to allow use of other mechanisms besides weighted lid thief hatches to ensure that the thief hatch lid remains properly seated. In addition, we are amending the requirements for storage vessels to clarify notification and other requirements under the NSPS for storage vessels affected facilities that are removed from service for reasons other than maintenance. Further, we are clarifying that Group 1 and Group 2 storage vessel affected facilities that are removed from service are no longer affected facilities and therefore have no requirements under the NSPS until they are returned to service. The status of a Group 1 or Group 2 storage vessel that is later returned to service depends on its new use, which can fall into three possible scenarios. If the storage vessel is used to replace a storage vessel affected facility, or is being connected in parallel with a storage vessel affected facility, it is immediately subject to the same requirements as the affected facility being replaced or with which it is being connected in parallel. If the vessel is not used to replace or connected in parallel with an affected facility but is being used to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water, it is allowed 30 days to determine if its VOC PTE is at least 6 tpy, and if so is subject to the requirements for Group 2 storage vessel affected facilities and would be required to control emissions no later than 60 days after return to service. If the vessel is being used in an application other than to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water, it does not meet the definition of ''storage vessel'' and is not an affected facility under the NSPS.

We are amending the requirements for reciprocating compressors to add a third alternative to the two existing work practice options for controlling emissions from rod packing venting. We are finalizing a third alternative that would allow routing emissions from the rod packing through a collection system under negative pressure via a closed vent system to a process.

We are finalizing two amendments to the equipment leaks requirements for natural gas processing plants. One is to correct an inadvertent omission we made in the 2012 NSPS concerning an exemption from routine leak detection in small gas processing plants and gas processing plants located on the Alaskan North Slope. In addition, we are amending the definition of ''equipment'' to clarify that the term, as used in relation to the equipment leaks requirements under the NSPS, refers only to equipment at onshore natural gas processing plants.

We are amending the provisions related to ''responsible official'' to remove any confusion by the regulated community with respect to the requirements for certifying under subpart OOOO and references to ''responsible official'' under the title V permitting program. To that end, we are changing the term ''responsible official'' to ''certifying official.'' We are also finalizing the proposed amendments to provide for delegation of authority after advance notification for facilities that employ 250 or fewer employees and have less than $25 million gross annual sales or expenditures (in second quarter 1980 dollars).

Finally, the EPA is removing a regulatory affirmative defense provision from the rule. If a source is unable to comply with emissions standards as a result of a malfunction, the EPA may use its case-by-case enforcement discretion to provide flexibility, as appropriate.

3. Cost and Benefits

Our analysis shows that owners and operators of affected facilities would choose to install and operate the same or similar air pollution control technologies under these amended

standards as would have been necessary to meet the previously finalized standards. We project that this rule will result in no significant change in costs, emission reductions or benefits. Even if there were changes in costs for these units, such changes would likely be small relative to both the overall costs of the individual projects and the overall costs and benefits of the final rule. Since we believe that owners and operators would put on the same or similar controls for this final rule that they would have for the original final rule, there should not be any incremental costs related to this final revision.

B. Does this reconsideration action apply to me?

Categories and entities potentially affected by today's action include:

TABLE 1—INDUSTRIAL SOURCE CATEGORIES AFFECTED BY THIS ACTION

Category	NAICS code [1]	Examples of regulated entities
Industry	211111	Crude Petroleum and Natural Gas Extraction.
	211112	Natural Gas Liquid Extraction.
	221210	Natural Gas Distribution.
	486110	Pipeline Distribution of Crude Oil.
	486210	Pipeline Transportation of Natural Gas.
Federal government		Not affected.
State/local/tribal government		Not affected.

[1] North American Industry Classification System.

This table is not intended to be exhaustive, but rather is meant to provide a guide for readers regarding entities likely to be affected by this action. If you have any questions regarding the applicability of this action to a particular entity, consult either the air permitting authority for the entity or your EPA regional representative as listed in 40 CFR 60.4 (General Provisions).

C. How do I obtain a copy of this document and other related information?

In addition to being available in the docket, electronic copies of the final and proposed rules will be available on the WorldWide Web. Following signature, a copy of the rule will be posted at the following address: *http://www.epa.gov/airquality/oilandgas/actions.html.*

D. Judicial Review

Under section 307(b)(1) of the CAA, judicial review of this final rule is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by March 2, 2015. Under section 307(d)(7)(B) of the CAA, only an objection to this final rule that was raised with reasonable specificity during the period for public comment can be raised during judicial review. Moreover, under section 307(b)(2) of the CAA, the requirements established by this final rule may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce these requirements. Section 307(d)(7)(B) of the CAA further provides that "[o]nly an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review." This section also provides a mechanism for us to convene a proceeding for reconsideration, "[i]f the person raising an objection can demonstrate to the EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule." Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, William Jefferson Clinton West Building, 1200 Pennsylvania Ave. NW., Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave. NW., Washington, DC 20460.

III. Summary of Final Amendments

This section presents a summary of the provisions of the final action with brief explanations where appropriate. In some cases additional, detailed discussions are provided in sections IV or V. The final amendments include revisions to certain reconsidered aspects of the existing 2012 NSPS as follows: (1) Provisions for well completions that clarify and amend existing requirements for handling of flowback gases and liquids; (2) definition of "low pressure gas well"; (3) requirements pertaining to determining the potential emissions from storage vessels; (4) requirements for thief hatches; (5) provisions for storage vessels that are removed from service and for those that are returned to service; (6) provisions for routing of emissions from reciprocating compressor rod packing to a process; (7) leak detection requirements at small natural gas processing plants and natural gas processing plants located on the Alaskan North Slope; (8) clarification of equipment subject to leak detection requirements under the NSPS; and (9) revised definition of "responsible official" and revision of the term to be "certifying official" for compliance certification purposes. In addition, we are removing the affirmative defense provisions from the startup, shutdown and malfunction provisions of the 2012 NSPS and are correcting technical errors in the 2012 NSPS. A summary of the final amendments resulting from our reconsideration is provided in the following paragraphs.

A. Well Completions

1. Handling of Flowback Gases and Liquids

In today's action we are finalizing requirements in § 60.5375 for handling of gases and liquids during flowback.

The regulatory language in the well completion provisions of § 60.5375 is amended to identify two distinct stages associated with well completion, with each stage having specific requirements for handling of gases and liquids. The final provisions are changed slightly from the proposed amendments in response to public comments. Discussion of our rationale for these changes since proposal are presented in section IV.A.

The flowback period consists of two stages, the "initial flowback stage" and the "separation flowback stage." The initial flowback stage begins with the

first flowback from the well following hydraulic fracturing or refracturing and is characterized by high volumetric flow water, containing sand, fracturing fluids and debris from the formation with very little gas being brought to the surface, usually in multiphase slug flow. During this stage, the flowback must be routed to a ''storage vessel'' or to a ''well completion vessel'' that can be a frac tank, a lined pit or any other vessel. Our reason for this requirement is to avoid having operators route the flowback to an unlined pit or onto the ground. During the initial flowback stage, there is no requirement for controlling emissions from the vessel, and any gas in the flowback during this stage may be vented. However, the operator must route the flowback to a separator unless it is technically infeasible for a separator to function. As a result, we have changed ''as soon as sufficient gas is present in the flowback for a separator to operate'' to ''unless it is technically infeasible for a separator to function.'' We stress that operators have the responsibility to direct the flowback to a separator as soon as conditions allow a separator to function and in accordance with the General Provision requirements to operate the affected facility in a manner consistent with good air pollution control practices for minimizing emissions.

The second stage is defined as the ''separation flowback stage.'' The point at which the separator can function marks the beginning of the separation flowback stage. This stage is characterized by the separator operating with a gaseous phase and one or more liquid phases in the separator. During this stage, the operator must route all salable quality gas from the separator to a gas flow line or collection system, re-inject the gas into the well or another well, use the gas as an on-site fuel source or use the gas for another useful purpose that a purchased fuel or raw material would serve. If, during the separation flowback stage, it is infeasible to route the recovered gas to a flow line or collection system, reinject the gas or use the gas as fuel or for other useful purpose, the recovered gas must be combusted. No direct venting of recovered gas is allowed during the separation flowback stage except when combustion creates a fire or safety hazard or can damage tundra, permafrost or waterways. With regard to infeasibility of collecting the salable quality gas, we believe that owners and operators plan their operations to extract a target product and evaluate whether the appropriate infrastructure access is available to ensure their product has a viable path to market before completing a well. However, there may be isolated cases in which, for reason(s) not within an operator's control, the well is completed and flowback occurs without a suitable flow line available. In those isolated instances, the NSPS provides a solution in § 60.5375(a)(3), which requires combustion of the gas unless combustion poses an unsafe condition as described above. During the separation flowback stage, all liquids from the separator must be directed to a storage vessel or to a well completion vessel, routed to a collection system or be re-injected into the well or another well.

The end of the separation flowback stage marks the end of the flowback period and is defined as the point at which the well is shut in and the flowback equipment is permanently disconnected from the well, or the startup of production. Identification of this point is discussed in detail in section IV.A. As provided in the 2012 NSPS, the operator has a general duty to safely maximize resource recovery and minimize releases to the atmosphere over the duration of the flowback period.

At some point following the end of the flowback period, depending on how long the well is shut in (if shut in), startup of production will occur. Depending on the situation, the operator may choose to startup production immediately following the end of flowback, once the well is temporarily shut in to remove flowback equipment, may begin production without shutting in and removing flowback equipment, or the operator might delay startup for some period of time by leaving the well shut in until permanent production equipment has been installed. Startup of production, whenever that occurs, marks the beginning of the 30-day period for determining VOC PTE for purposes of making a storage vessel affected facility determination in accordance with the procedure in § 60.5365(e). If the criteria in § 60.5365(e) are met, the operator would have to comply with the control requirements in § 60.5395(d)(1) within 60 days after the startup of production. During this period, any recovered liquids must be routed to well completion vessels, storage vessels or a collection system. A well completion vessel to which liquids are routed from the well for a period in excess of 60 days after startup of production would be considered a ''storage vessel'' under the NSPS and, depending on its VOC PTE, would be subject to the control, cover and closed vent system requirements for storage vessel affected facilities. We are finalizing amendments to § 60.5365(e) to reflect that, for storage vessels associated with production following completions, the 30-day period for the affected facility determination required § 60.5365(e) commences on startup of production. We are also amending the requirements for storage vessel affected facilities in § 60.5395(d)(1)(i) to reflect that, for purposes of the well completion provisions, control is required no later than 60 days from startup of production.

To accompany these changes, we are also amending the reporting and recordkeeping requirements in § 60.5420 to revise the terminology used in that section relating to periods of gas recovery, combustion and venting to be compatible with the terms used in the final clarifying amendments to § 60.5375, including addition of a requirement to document the time of the beginning of flowback, the time at which the operator directs the flowback to a separator (each time this is done), the reason for reverting back to the initial flowback stage (if this is done), the time of well shut in and removal of flowback equipment (end of the flowback period) and time of startup of production (beginning of the PTE determination period). We are also revising the language used in requirements for exploratory, delineation and low pressure wells in § 60.5375(f) to be consistent with the final amended terminology and requirements in § 60.5375(a).

2. Definition of ''Low Pressure Gas Well''

We are finalizing the re-proposed 2012 EPA definition of ''low pressure gas well'' without change. This definition is used in conjunction with § 60.5375(f), which provides that those wells for which a reduced emissions completion (REC) would not be feasible because of a combination of well depth, reservoir pressure and flow line pressure is not required to meet the requirements for recovery of gases and liquids required under § 60.5375(a). Instead of having to perform an REC and recover gas during the separation flowback stage, operators performing completions of low pressure gas wells (in addition to wildcat wells and delineation wells) are required only to combust the gas rather than capture it during flowback. The 2012 NSPS included a definition of ''low pressure gas well'' in the final rule that is based on a mathematical formula that takes into account a well's depth, reservoir pressure and flow line pressure. The

definition of ''low pressure gas well'' is found in § 60.5430.

Following publication of the final rule, several petitioners for administrative reconsideration (hereinafter ''petitioners'') questioned the technical merits of the low pressure well definition and asserted that the public had not had an opportunity to comment on the definition because it was added in the final rule. In the July 17, 2014, proposed rule, we re-proposed the 2012 definition and solicited comment on an alternative definition provided by these petitioners.[1] For the reasons discussed in detail in section V.A, we are retaining the 2012 definition without change.

B. Storage Vessels

On September 23, 2013, the EPA published amendments primarily focused on storage vessel implementation issues raised by petitioners following publication of the 2012 final NSPS. Following publication of the 2013 storage vessel amendments, three petitioners filed additional administrative reconsideration petitions, in which they raised issues with regard to various provisions of the 2013 amendments. Among these issues are requirements for determining PTE for storage vessels employing vapor recovery under a legal and practically enforceable limitation, requirement for thief hatches being properly seated and clarification of the term ''storage vessels removed from service.''

1. PTE Determination for Storage Vessels Employing Vapor Recovery Under a Legally and Practically Enforceable Limitation

We are finalizing amendments to § 60.5365(e) to allow the PTE exclusion provision only in cases where a storage vessel is not subject to any legally and practically enforceable limitation or other requirement under a federal, state, local or tribal authority. An owner or operator invoking this exclusion provision must comply with the provisions of § 60.5365(e)(1) through (4) in determining VOC PTE for purposes of determining affected facility status.

2. Thief Hatch Properly Seated

We are finalizing amendments to § 60.5411(b)(3) to require that thief hatches be equipped, maintained and operated with a weighted mechanism or equivalent, to ensure that the lid remains properly seated. This amendment provides for proper seating of thief hatch lids while allowing innovation and flexibility in design not afforded by requiring that thief hatch lids be weighted.

3. Storage Vessels Removed From Service

As proposed, we are amending § 60.5395(f)(1) and (2), and § 60.5420(b)(6), to require that the dates that storage vessel affected facilities are removed from service and returned to service be included when reporting those actions.

For the reasons discussed in detail in section IV.B, we are also amending the NSPS to clarify that a Group 1 and Group 2 storage vessel affected facility that is removed from service, which is defined in § 60.5430 as physically isolated and disconnected from the process for a purpose other than maintenance and, pursuant to § 60.5395(f)(1), completely emptied and degassed and no longer used to contain crude oil, condensate, produced water or intermediate hydrocarbon liquids, would no longer meet the definition of ''storage vessel'' in § 60.5430 and, therefore, cease to be affected facilities under the NSPS for the period they are out of service.

We are also amending the NSPS to provide that a Group 1 or Group 2 storage vessel affected facility that is returned to service is subject to the NSPS based on the use of the vessel in its new application. There are three possible scenarios for vessels returned to service: (1) The vessel is used to replace a storage vessel affected facility or is connected in parallel with a storage vessel affected facility; (2) the vessel is not used to replace an affected facility but is being used to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water; or (3) the vessel is being used in an application other than to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water. If the vessel is being used to replace a storage vessel affected facility or is connected in parallel with a storage vessel affected facility (*i.e.,* the liquid contents and the VOC PTE are already known), then it is a storage vessel affected facility and immediately upon startup would be subject to the same requirements as the storage vessel affected facility being replaced. If the vessel is not being used to replace an affected facility but is being used to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water (*i.e.,* the VOC PTE is unknown), then, just as for any new storage vessel, the operator would be afforded a 30-day period after startup to determine the storage vessel's affected facility status based on VOC PTE and, if VOC PTE were estimated to be at least 6 tpy, the storage vessel would be determined an affected facility and would be subject to requirements for Group 2 storage vessels, and controlled no later than 60 days after startup. If the vessel is not being used to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water, it does not meet the definition of ''storage vessel'' and would not be subject to the requirements of the NSPS.

We are amending the definition of ''removed from service'' and adding a definition of ''returned to service'' to clarify these provisions. See section IV.B for a detailed discussion.

C. Routing of Reciprocating Compressor Rod Packing Emissions to a Process

The 2012 final NSPS includes operational or ''work practice'' standards for reciprocating compressors to reduce emissions from gas vented from the piston rod packing as the rod moves during operation. The rule requires regular rod packing replacement every 26,000 hours of operation or, if the owner and operator elect, every 36 months. On October 15, 2012, the Administrator received a petition for administrative reconsideration of the performance standards for reciprocating compressors that asserted that an alternative technology exists that would reduce emissions commensurate with or better than the reductions from the operational standard. This technology consists of recovering vented emissions from the rod packing under negative pressure and routing these emissions of otherwise vented gas to the air intake of a reciprocating internal combustion engine, or other process that would burn the gas as fuel to augment the normal fuel supply. Based on our review of the information submitted by the petitioner, we conclude that the technology has merit and would provide equivalent or better emissions reduction since the emissions would be captured under negative pressure, allowing all emissions to be routed to the engine. It is our understanding that this technology may not be applicable to every compressor installation and situation and, therefore, it would be within the operator's discretion to choose whichever option is most appropriate for the application and situation at hand.

Therefore, for the above reasons and as discussed in the proposed rule, we are revising § 60.5385(a) to include a third option for routing the rod packing emissions to a process through a closed

[1] Email from James D. Elliott, Spilman, Thomas & Battle PLLC, to Bruce Moore, EPA, March 24, 2014.

vent system that meets the requirements of § 60.5411(c).

Also as proposed, we are amending the closed vent system requirements in § 60.5411(a) and (b) to apply to reciprocating compressors (in addition to centrifugal compressor wet seal degassing systems, to which those sections already apply). Similarly, we are amending the continuous compliance requirements in § 60.5415 and inspection and monitoring requirements in § 60.5416 to apply to reciprocating compressors.

The EPA received comments in support of the addition of the third alternative in § 60.5385(a). However, commenters identified several inconsistencies that should be addressed with respect to other provisions as they relate to the revised § 60.5385(a). The EPA agrees with the commenters' rationale and is amending §§ 60.5410(c)(1), 60.5415(c)(4), 60.5416(a), and 60.5420(c)(6) through (9) to be consistent with the intent of the third alternative provision in § 60.5385(a)(3). Specifically, we are revising the initial compliance demonstration provisions in § 60.5410(c)(1) by adding language such that paragraphs (c)(1) through (4) would not apply to sources electing to comply with § 60.6385(a)(3). The EPA agrees with commenters that these provisions would not apply to sources that are operating a closed vent systems and complying with § 60.5385(a)(3). We are revising the continuous compliance demonstration provisions in § 60.5415(c)(4) to reflect that the source must comply with 60.5416(a) and (b) rather than § 60.5411(a) and (b). The EPA agrees that the provisions of § 60.5416(a) and (b) are more appropriate for a reciprocating compressor operating with a closed vent and cover system. We are amending § 60.5420(c)(6) through (9) to add reciprocating compressors as sources subject to these recordkeeping requirements.

D. Equipment Leaks at Gas Processing Plants

1. Small Gas Processing Plants and Gas Processing Plants Located on the Alaskan North Slope

The equipment leaks standards in the 1985 NSPS subpart KKK requires routine leak detection at natural gas processing plants for certain equipment, specifically pumps in light liquid service, valves in gas/vapor and light liquid service, and pressure relief valves from gas/vapor service. Subpart KKK provides for exemptions for pumps in light liquid service, valves in gas/vapor and light liquid service, and pressure relief valves in gas/vapor service from routine monitoring requirements at small natural gas processing plants (*i.e.,* plants that do not have the design capacity to process at least 10 million standard cubic feet of field gas per day) and at natural gas processing plants located on the Alaskan North Slope. With the exception of the revision to lower the leak definition for valves, we retained the other provisions of subpart KKK by adopting the subpart KKK regulatory text, including the above mentioned exemptions, in subpart OOOO. With this complete adoption of subpart KKK regulatory text on the exemptions, we inadvertently failed to update the equipment list to include connectors, as pointed out by petitioners. We agree that this omission was an oversight and that it was not our intent for the 2012 NSPS to single out connectors at small gas processing plants and at gas processing plants located on the Alaska North Slope for routine leak detection while exempting the other equipment at these plants from these requirements. As a result, as proposed, we are amending § 60.5401(d) and (e) to add connectors to the list of equipment exempt from routine leak detection at these plants.

2. Equipment Under Subpart OOOO Subject to Leak Detection Requirements

Petitioners pointed out that the definition of "equipment" in § 60.5430 of the 2012 final NSPS could be misinterpreted to expand the scope of the equipment leaks program under subpart OOOO to cover beyond onshore natural gas processing plants, which was the scope of subpart KKK. Except for lowering the leak definition for valves and requiring monitoring of connectors, subpart OOOO retains the other provisions of the subpart KKK by adopting those provisions, including the definition of "equipment." Because subpart KKK pertained only to onshore natural gas processing plants, the phrase "any device or system required by this subpart" refers to only devices and systems at onshore natural gas processing plants. However, since subpart OOOO also covers affected facilities not located at onshore natural gas processing plants, the phrase could be misinterpreted to apply to every affected facility under the entire subpart OOOO, including those not located at onshore natural gas processing plants. To avoid any such misinterpretation, we are amending the definition of "equipment" in § 60.5430 to read as set forth in the regulatory text of this rule.

E. Definition of "Responsible Official"

The 2012 final rule requires certification by a responsible official of the truth, accuracy and completeness of the annual report. Petitioners pointed out that the definition of "responsible official" is not appropriate for the oil and natural gas sector due to the large number and wide geographic distribution of the small sources involved. Petitioners suggested that the EPA should develop a certification requirement specific to the Oil and Natural Gas Sector NSPS that would allow delegation of the authority of a responsible official to someone, such as a field or production supervisor, who has direct knowledge of the day-to-day operation of the facilities being certified, without requiring that such delegation be pre-approved by the permitting authority.

We reexamined the definition of "responsible official" and agree with petitioners that the current language in the NSPS, specifically the requirement to seek advance approval by the permitting authority of the delegation of authority to a representative if the facility employs 250 or fewer persons, is too burdensome for the oil and natural gas sector. Therefore, consistent with the proposed changes, we are also amending the definition to make such delegation effective after advance notification rather than after approval. Requirements for delegation to representatives responsible for one or more facilities that employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars) are unchanged from the 2012 NSPS (*i.e.,* there is no advance notification or approval required for such delegations).

Petitioners also noted that the current definition does not adequately address the complex ownership arrangements of limited partnerships. We agree with the petitioners and believe limited partnerships should be reflected in the definition along with sole proprietorships and partnerships which are currently addressed.

In the process of this evaluation, we also determined that the use of "permitting authority" and the "responsible official" are similar to terms used in the requirements of the Title V permitting program. In order to remove potential confusion by the regulated community and to clarify that this is a requirement of the NSPS and is not associated with a permitting program, we are changing the term "responsible official" to "certifying official" and replacing the term

''permitting authority'' used in the definition with ''Administrator.''

F. Affirmative Defense

The EPA is removing a regulatory affirmative defense provision from the rule, as proposed. For the reasons stated in the preamble to the proposed amendments and below, we are finalizing the removal of the affirmative defense provisions. In the 2012 rulemaking, the EPA had included an affirmative defense to civil penalties for violations caused by malfunctions in an effort to create a system that incorporates some flexibility, recognizing that there is a tension, inherent in many types of air regulation, to ensure adequate compliance while simultaneously recognizing that despite the most diligent of efforts, emission standards may be violated under circumstances entirely beyond the control of the source. Although the EPA recognized that its case-by-case enforcement discretion provides sufficient flexibility in these circumstances, it included the affirmative defense to provide a more formalized approach and more regulatory clarity. See *Weyerhaeuser Co.* v. *Costle,* 590 F.2d 1011, 1057–58 (D.C. Cir. 1978) (holding that an informal case-by-case enforcement discretion approach is adequate); but see *Marathon Oil Co.* v. *EPA,* 564 F.2d 1253, 1272–73 (9th Cir. 1977) (requiring a more formalized approach to consideration of ''upsets beyond the control of the permit holder.''). Under the EPA's regulatory affirmative defense provisions, if a source could demonstrate in a judicial or administrative proceeding that it had met the requirements of the affirmative defense in the regulation, civil penalties would not be assessed. Recently, the United States Court of Appeals for the District of Columbia Circuit vacated an affirmative defense in one of the EPA's section 112 regulations. *NRDC* v. *EPA,* 749 F.3d 1055 (D.C. Cir., 2014) (vacating affirmative defense provisions in section 112 rule establishing emission standards for Portland cement kilns). The court found that the EPA lacked authority to establish an affirmative defense for private civil suits and held that under the CAA, the authority to determine civil penalty amounts in such cases lies exclusively with the courts, not the EPA. Specifically, the Court found: ''As the language of the statute makes clear, the courts determine, on a case-by-case basis, whether civil penalties are 'appropriate.' '' See *NRDC,* at 1063 (''[U]nder this statute, deciding whether penalties are 'appropriate' in a given private civil suit is a job for the courts, not EPA.'').[2] In light of *NRDC,* the EPA had proposed and is finalizing in this action the removal of the regulatory affirmative defense provisions in subpart OOOO. As explained above, if a source is unable to comply with emissions standards as a result of a malfunction, the EPA may use its case-by-case enforcement discretion to provide flexibility, as appropriate. Further, as the D.C. Circuit recognized, in an EPA or citizen enforcement action, the court has the discretion to consider any defense raised and determine whether penalties are appropriate. *Cf. NRDC,* at 1064 (arguments that violation were caused by unavoidable technology failure can be made to the courts in future civil cases when the issue arises). The same is true for the presiding officer in EPA administrative enforcement actions.[3]

IV. Summary of Significant Changes Since Proposal

Section III summarized the amendments to the 2012 NSPS that the EPA is finalizing in this rule. This section discusses the key changes the EPA has made since proposal. These changes are the result of the EPA's consideration of the many substantive and thoughtful comments submitted on the proposal and other information received since proposal. We believe that the changes we have made sufficiently address concerns expressed by commenters and improve the clarity of the rule while improving or preserving public health and environmental protection required under the CAA.

A. Well Completions

1. Handling of Flowback Gases and Liquids

In today's action we are finalizing clarifications and amendments to provisions for handling of gases and liquids during flowback at § 60.5375. Following publication of the 2012 final NSPS, we received feedback from petitioners that the well completion provisions were unclear and that operators were not sure of the requirements for handling of gas and liquids during well completion operations. Petitioners also asserted that, as written, compliance with the 2012 NSPS was impossible, since the rule appeared to prohibit venting of gas at any time during the well completion. In our July 17, 2014, proposal, we clarified it was not the EPA's intent to prohibit venting of flowback gases throughout the entire flowback period and we understood that there were periods during which gas may be present in the flowback but with insufficient volume and consistency of flow to enable either combustion or recovery of the gas after separation. We confirmed that the initial flowback (prior to recovery of gas from the liquids through separation) may be routed to storage vessels, temporary fracture tanks (frac tanks) or to lined pits, as long as separation and recovery of the gas occurs as soon as practicable, consistent with the general duty to maximize resource recovery and minimize releases to the atmosphere as required in § 60.5375(a)(4).

To clarify EPA's intent with regard to handling of gas and liquid portions of flowback, we had proposed three distinct stages of the completion operation, with each stage having specific requirements for handling of gases and liquids.

As proposed, the first stage would begin with the first flowback from the well following hydraulic fracturing or refracturing, and would be characterized by high volumetric flow water, with sand, fracturing fluids and debris from the formation, with very little gas being brought to the surface, usually in multiphase slug flow. Under the proposed amendments, the first stage was defined as the ''initial flowback stage.'' We had proposed that during this stage the flowback would be required to be routed to a ''well completion vessel'' that could be a frac tank, a lined pit or any other vessel. Our intention was that the flowback could not be directed to an unlined pit or onto the ground. During the initial flowback stage, there would be no requirement for controlling emissions from the tank or other vessel, and any gas in the flowback during this stage could be vented. We proposed that, as soon as sufficient gas is present in the flowback for a separator to operate, the flow would be required to be diverted to the separator. We explained that ''for a separator to function enough gas must be flowing [in the flowback] to maintain a gaseous phase and one or more liquid phases in the separator.'' (79 FR 41755). In the proposal preamble, we had

[2] The court's reasoning in *NRDC* focuses on civil judicial actions. The Court noted that ''EPA's ability to determine whether penalties should be assessed for Clean Air Act violations extends only to administrative penalties, not to civil penalties imposed by a court.'' *Id.*

[3] Although the *NRDC* case does not address the EPA's authority to establish an affirmative defense to penalties that is available in administrative enforcement actions, EPA had not included such an affirmative defense in the 2012 NSPS. As explained above, such an affirmative defense is not necessary. Moreover, assessment of penalties for violations caused by malfunctions in administrative proceedings and judicial proceedings should be consistent. *Cf.* CAA section 113(e) (requiring both the Administrator and the court to take specified criteria into account when assessing penalties).

discussed how some operators monitor the gas concentration at the vessel receiving the flowback both for safety reasons and to determine that sufficient gas is present in the flowback for the separator to function. We understood that when the gas concentration approaches the lower explosive limit (LEL) (*i.e.,* approaches flammability), these operators direct the flowback to a separator. We were uncertain whether this method could be used effectively in all applications and whether there were other techniques used by operators to make this determination. We solicited comment on the suitability of the ''LEL method'' when used for this purpose and asked for information on other techniques or indicators that could be used to determine when sufficient gas is present for a separator to function.

Commenters responded that the EPA apparently had misunderstood earlier discussions regarding use of the LEL detector. They asserted that the detector is used for safety reasons and that although the LEL detector indicates that there may be potential flammability, it does not necessarily indicate that sufficient gas is present for the separator to function. Commenters also asserted that monitoring the gas concentration does not reflect other conditions such as sand and water content and well characteristics that have a bearing on the point where the separator will operate. We also learned that some operators begin to direct the flowback to the separator immediately upon initial flowback, even though it may not maintain a gaseous phase and one or more liquid phases in the separator. Other operators may not have an initial flowback stage and may go directly to the separation flowback stage.

Because whether a separator can operate may depend on site specific factors other than the amount of gas present in the flowback, we are not finalizing the proposed requirement to commence operation of a separator as soon as sufficient gas is present in the flowback for a separator to operate. However, the public comments did not provide sufficient information regarding other indicators as to when a separator can operate. We therefore are unable to establish specific criteria for determining the point at which operators are required to route the flowback to the separator. For the reasons stated above, we require in the final amendments that flowback must be routed to a separator unless it is technically infeasible. This has always been our intent. Although we learned that technical infeasibility is not strictly limited to the amount of gas present, we believe that if this infeasibility is not predicated solely on the amount of gas present, then there must be some other site-specific technical issues that prevent a separator from functioning. Such technical infeasibility might include the separator being overwhelmed by the flowback, such that the vapor space in the separator is not maintained, or the liquid drain is unable to handle the volume of liquid flowing through. We further note that the general duty to maximize resource recovery and minimize releases to the atmosphere required in § 60.5375(a)(4) applies during the entire flowback period, including the initial flowback stage.

As proposed, the second stage, defined as the ''separation flowback stage,'' begins when the flowback gases and liquids are routed to the separator. During the separation flowback stage, the operator would be required to route the recovered gas into a gas flow line or collection system, re-inject the recovered gas into the well or another well, use the recovered gas as an on-site fuel source or use the recovered gas for another useful purpose that a purchased fuel or raw material would serve. If, during the separation flowback stage, it was infeasible to route the recovered gas to a flow line or collection system, reinject the gas or use the gas as fuel or for other useful purpose, the recovered gas (*i.e.,* ''flowback emissions'') would have to be combusted using a completion combustion device, as required in the 2012 NSPS at § 60.5375(a)(3). No direct venting of recovered gas would be allowed during the separation flowback stage. We also proposed that, at any time during the separation flowback stage, if the gas present in the flowback becomes insufficient to maintain operation of the separator, the operator would revert to the initial flowback stage until the separator could again function to allow continuous recovery of the gas and to allow separation and recovery of the liquids. During the separation flowback stage, all liquids from a separator could be directed to one or more well completion vessels or storage vessels, or be re-injected into the well or another well. We are finalizing the provisions relative to the separation flowback stage as proposed, except that the operator can revert to the initial flowback stage if it is technically infeasible to maintain function of the separator (consistent with our discussion above on requiring the operation of a separator unless it is technically infeasible). We also have added requirements for recordkeeping to document each occurrence of reverting back to the initial flowback stage and the reason for the reversion.

We had proposed that the end of the separation flowback stage was the point where separation flowback would have declined and stabilized enough to allow continuous recovery of the gas and where separation and recovery of any crude oil, condensate and produced water were possible. We had proposed that the flowback period of a well completion operation included only the initial flowback stage and the separation flowback stage, as flowback ended and ongoing production began at that point. Further, we had identified that point as the beginning of the ''production stage'' of the well completion. We had also explained at proposal that we were seeking to identify objective criteria for making a determination that flowback had subsided and that the well had reached the point where production could begin, marking the end of the separation flowback stage and the beginning of the production stage. We solicited comment on the characteristics of the flow or other conditions that could be used to establish such criteria.

In addition, we proposed that, for storage vessels receiving liquids following the flowback period of a well completion, the beginning of the production stage would also begin the 30-day period for determining VOC PTE for purposes of making a storage vessel affected facility determination in accordance with the procedure in § 60.5365(e). If the criteria under § 60.5365(e) were met, the operator would have to comply with the control requirements in § 60.5395(d)(1) within 60 days after the beginning of the production stage. We had also proposed amendments to § 60.5365(e) to reflect that, for purposes of the well completion provisions, the 30-day period for the affected facility determination required in § 60.5365(e) would commence at the beginning of the production stage. During the production stage, any venting or flaring of the recovered gas would be prohibited.

Several commenters took issue with the inclusion of the production stage as part of the overall well completion operation. The commenters contended that this extension confuses or contradicts other provisions that explicitly are applicable to well completion operations and should not be applicable over the lifetime of a well in production. The commenters asserted that it is critical that the rule identify when the flowback period ends and clarify that the requirements for well completions do not extend beyond the end of the flowback period. The

commenters explained that, because the production stage could conceivably continue for decades, it was clearly not a stage of well completion and was beyond the intended scope of § 60.5375. Commenters also gave examples of the ramifications of this concept. They asserted that prohibition of venting and flaring for the lifetime of the well would preclude planned maintenance workovers, flaring of amine system overhead gas and venting of carbon dioxide.

We agree with the commenters that the production stage should not be a stage of well completion and understand that compliance with the well completion provisions (which were intended only for the flowback period) would be impossible were these provisions applicable throughout the life of the well. As a result, we are finalizing requirements for well completions that identify two stages of well completion, the initial flowback stage and the separation flowback stage.

As discussed above, we had proposed that the point where separation flowback would have declined and stabilized enough to allow continuous recovery of the gas and where separation and recovery of any crude oil, condensate and produced water were possible would be the end of the separation flowback stage and the beginning of the production stage. We solicited information that could identify criteria for defining this point. Commenters explained that removal of flowback equipment and absence of well completion personnel were two indicators that flowback had subsided and the well had cleaned up sufficiently to allow production to begin.

In addition to the information provided by commenters, it is our observation that the permanent disconnection of the temporary equipment used during flowback can be an indicator of flowback having ended. For example, during flowback, skid-mounted choke manifolds are used to limit flowback and assist in directing the flow. Temporary lines laid on the ground from the wellhead to the choke manifold and to the flowback separators and frac tanks are connected with ''hammer unions'' which are pipe unions that are designed for ease of making temporary connections and are characterized by ''ears'' that allow the joint to be made up quickly by striking with a hammer. After flowback has subsided and the well has cleaned up sufficiently, the well is temporarily shut in to disconnect the temporary flowback equipment. We believe that when the operator permanently disconnects choke manifolds, temporary separators, sand traps and other equipment connected with temporary lines and hammer unions, it is a reliable indicator that flowback has ended and the well is ready for production. At that point, we believe that operators will remove these temporary equipment used during flowback to avoid incurring unnecessary charges for additional days the equipment remains onsite. The well could start production immediately or it could remain shut in until permanent equipment is installed some time later.

In light of the above considerations, we are amending the NSPS such that the end of the separation flowback stage is defined as the startup of production, or when the well is shut in and the temporary flowback equipment has been permanently disconnected from the well. We are also finalizing amendments that identify the startup of production, rather than the beginning of the production stage, as the beginning of the 30-day period for determining storage vessel PTE according to the requirements of § 60.5365(e).

As discussed in section V.A, we had received comment that some operators route gas and liquids from the well site to other facilities for collection and suggested we specify ''collection system'' as one of the options for disposition of flowback liquids and recovered gas. We agree with the commenter and have included ''collection system'' in the provisions for gas and liquids handling during well completions. To provide clarity, we also have added a definition in § 60.5430 for ''collection system'' which is presented in section V.A.

We are finalizing the liquids handling requirements during the flowback period as proposed, with the slight revision to the definition of the separation flowback stage as described above. During the flowback period, which includes the initial flowback stage and the separation flowback stage, the liquid portion of the flowback must be directed to storage vessels, well completion vessels, injected into the well or another well or routed to a collection system.

In the proposed rule, we had provided that the 30-day period for estimating the VOC PTE of a storage vessel receiving recovered liquids would begin at the beginning of the production stage. With the revision to the stages of completion discussed above, ''startup of production'' would replace ''beginning of the production stage.'' Because we believe it is important to achieve control of storage vessel affected facilities as soon as practicable, we believe it is important to begin the 30-day period for estimating storage vessel VOC PTE as soon as this estimation can be achieved and will provide a representative estimate of the storage vessel's PTE during production. As a result, we believe it is necessary to begin the estimation period after flowback ends, immediately after the end of the separation flowback stage, since the flowback period is not representative of liquids flow and composition during production. Estimation during the flowback period could result in PTE estimates being either abnormally low or abnormally high, since very early in flowback the liquid is predominantly water flowing at a high rate, while immediately after flowback, the volume has subsided but VOC content of the liquid may be much higher. Tank emission estimation methods generally require information on both the composition of the liquid entering a storage vessel (generally obtained through analysis of a pressurized sample of the liquid obtained from the separator) and the volumetric rate of the liquid (often in barrels per day). Because the analytical samples are taken from the separator and the volume is calculated by recording the liquid collection from the receiving vessel, it is not necessary to have a permanent storage vessel installed in order to perform this estimation, and the sampling and volume tracking can begin at any time after the end of flowback, while the liquids are being collected in a well completion vessel or a storage vessel. Based on these considerations, we are finalizing the requirement that liquid during flowback may be routed to a well completion vessel or storage vessel. Also, based on these considerations, we are clarifying that recovered liquids may continue to be routed to a well completion vessel or a storage vessel after the startup of production, but that a well completion vessel to which recovered liquids are routed for a period in excess of 60 days after startup of production is considered a storage vessel subject, depending on its PTE, to control under § 60.5395, as with any other storage vessel affected facility. In addition, we are amending the definitions of ''storage vessel'' and ''well completion vessel'' to be consistent with this requirement. We are amending § 60.5395(d)(1)(i) to reflect that, for purposes of the well completion provisions, control would be required no later than 60 days from startup of production. Consistent with these changes we are amending § 60.5395(d)(1)(i) to read as set forth in the regulatory text of this rule.

We note that we have received requests for clarification of the meaning

of "maximum average daily throughput" as used in the VOC PTE determination language in § 60.5365(e). The 2013 final rule that promulgated storage vessel implementation amendments in which this term first appeared in the NSPS provided limited guidance on how operators should determine "maximum average daily throughput," and no definition of this term was included in the July 2014 proposed rule. The discussion above explains that PTE determination methods generally are based on modeling performed using results of analysis of pressurized samples from the separator combined with liquid throughput over some period that corresponds with the separator sample. We believe that the "maximum average daily throughput" is determined by the earliest calculation of daily average throughput during the 30-day evaluation period employing generally accepted methods. Based on the performance of wells over time, this initial calculation would represent the maximum average daily throughput that could be expected for the storage vessel. To provide more clarity in the rule, we have added a definition of "maximum average daily throughput" in § 60.5430. We are aware that issues remain concerning this term and continue to consider how to resolve them.

B. Storage Vessels

1. Storage Vessels Removed From Service and PTE Determination

As proposed, we are amending § 60.5395(f) and § 60.5420(b)(6) to require that the dates that storage vessel affected facilities are removed from service and returned to service be included when reporting those actions.

For the reasons discussed below, we are also amending the NSPS to clarify that storage vessel affected facilities removed from service (which is defined as when they are physically disconnected from their source of liquids for reasons other than maintenance and are emptied and degassed) cease to be storage vessel affected facilities under the NSPS. We received comment, with which we agree, that storage vessel emissions are a function of the specific use of the vessel as installed—determined by factors such as the type of liquid it is used to contain, the liquid throughput of the vessel, and the pressure drop of the liquid entering the vessel causing flash emissions. As a result, removing a storage vessel from service in one use and moving it to a new use could drastically change its emissions characteristics. To be classified a "storage vessel" as defined in § 60.5430, a tank or other vessel must be used to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water. Should the tank or other vessel cease being used to contain any of these liquids, it would no longer meet the definition of "storage vessel." In light of these considerations, we believe that a storage vessel affected facility that has been physically isolated and disconnected from the process for a purpose other than maintenance, has been completely emptied and degassed and is no longer used to contain crude oil, condensate, produced water or intermediate hydrocarbon liquids should not be subject to requirements under the NSPS for the period of time it is removed from service.

A vessel, whether it is in service for the first time or after being removed from service, falls into one of three categories: (1) It is installed to replace a storage vessel affected facility or is connected in parallel with a storage vessel affected facility, where liquids to be contained and VOC PTE for the application are already known; (2) the vessel does not replace a storage vessel affected facility but is being returned to service to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water with unknown PTE; or (3) the vessel is being used in an application other than to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water.

A vessel falling under the first category, that is replacing or is being connected in parallel with a vessel that has already been determined to be a "storage vessel affected facility" based on a known PTE, in effect takes the place of the affected facility being replaced or with which it is being connected in parallel and, as such, should be immediately subject to the same requirements as the storage vessel affected facility being replaced. There is no need for the 30-day period after startup allowed under § 60.5365(e) for determining its VOC PTE and the 60-day period after startup allowed under § 60.5395(c) for applying control. In short, a vessel in this category should be subject immediately upon startup to the same requirements as the storage vessel affected facility it is replacing. For example, a vessel that is replacing a storage vessel affected facility subject to the 95.0 percent control requirement in § 60.5395(d)(1) would be subject to § 60.5395(d)(1), whereas a vessel that is replacing a storage vessel affected facility subject to the 4 tpy alternative uncontrolled emission standard in § 60.5395(d)(2) would be subject to § 60.5395(d)(2).

For vessels in the second category, *i.e.,* the vessel does not replace a storage vessel affected facility but is being returned to service to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water with unknown PTE, the 30-day period for determining the VOC PTE and the 30-day period for installation of control if the PTE is 6 tpy or above would apply.

For vessels in the third category, *i.e.,* the vessel is being used in an application other than to contain crude oil, condensate, intermediate hydrocarbon liquids or produced water, the vessel continues to not meet the definition of "storage vessel" for this rule and has no requirements while in this service.

Although we believe it is an unlikely occurrence, we note that, when two or more storage vessels receive liquids in parallel, the total throughput is shared between or among the parallel vessels and, in turn, this causes the PTE of each vessel to be a fraction of the total PTE. In these cases, the EPA would consider the parallel storage vessels equivalent to a single vessel with PTE equal to the sum of the PTE of the individual vessels. As a result, the parallel storage vessels would be considered storage vessel affected facilities and subject to control if the total PTE was at least 6 tpy. If one of the parallel storage vessels has already been determined to be an affected facility and is subject to storage vessel requirements, no PTE calculation is necessary for the other parallel storage vessels because the PTE is already known to be at least 6 tpy. In that event, all storage vessels receiving liquids in parallel to the storage vessel affected facility are subject to the same requirements immediately upon startup. As a result of the above considerations, we are amending the current definition of "removed from service" and adding a definition of "returned to service" to clarify these provisions. The definitions read as set forth in the regulatory text of this rule.

We are also amending § 60.5395(f) to include requirements for storage vessels removed from service and returned to read as set forth in the regulatory text of this rule.

C. Definition of "Responsible Official"

In our proposed action, the EPA proposed to amend the definition of "responsible official" to address several concerns identified by petitioners as discussed above in section III.E. In our evaluation of comments received from regulatory authorities and industry, we determined that the terminology used for the definition of "responsible official" too closely mirrored

terminology used in the Title V permitting program. As the requirements of subpart OOOO are separate and distinct from those of any permitting program, we found that the use of those terms was inappropriate for subpart OOOO and could potentially cause confusion of regulated entities. Therefore, in addition to the proposed change to the definition to reduce the burden of the advance delegation requirements on the oil and gas industry, we are changing the term ''responsible official'' to ''certifying official'' and changing the term ''permitting authority'' used in the definition to ''Administrator.''

V. Summary of Significant Comments and Responses

This section summarizes the significant comments on our proposed amendments and our response thereto.

A. Well Completions

1. Handling of Gases and Liquids

Comment: One commenter concurs that many wells undergo the three stages of well completion as defined in the preamble to the proposed rule, but not all wells. The commenter points to the Fayetteville Shale where the flowback from many of their wells are routed directly to a separator with gas recovered into gathering lines and produced water sent to frac tanks and then to lined earthen retention ponds. The commenter asserts that these wells do not undergo the initial flowback stage nor the separation flowback stage and instead go directly into production stage as defined in the proposed rule.

Response: The EPA acknowledges that there are differences in reservoir characteristics and the resultant variations in composition of the flowback between shale plays and even within a given shale play. These differences affect how the well completion process is conducted. As we discussed in section IV.A, we are aware that some operators are able to route the flowback directly to a separator, essentially bypassing the initial flowback stage. We agree with the commenter that this is possible in some cases; however, that may not be true for all situations. The final rule requires operators to direct the flow to the separator unless it is technically infeasible for the separator to function (which we explain in further detail in section IV.A) and minimize releases to the atmosphere as required by § 60.5375(a)(4). We disagree with the commenter that their operation bypasses both stages of flowback, if the operations the commenter described used a temporary separator or other temporary flowback equipment. If a temporary separator or other temporary flowback equipment were used, then the operation would bypass the initial flowback stage but enter the separation flowback stage and would be subject to the requirements of § 60.5375(a)(1)(ii). If such temporary flowback equipment is not used, then the completion operation is indeed considered to enter directly into production at the beginning of flowback, which in this case would be considered ''startup of production,'' that begins the 30-day period for determining VOC PTE for purposes of making a storage vessel affected facility determination in accordance with the procedure in § 60.5365(e). However, should the well completions described by the commenter involve the use of temporary flowback equipment, then the onset of flowback would begin the separation flowback stage, which would continue until the well was shut in and the temporary flowback equipment was removed. There would be no initial flowback stage in either case described above.

Comment: One commenter supports the EPA's proposed definition of initial flowback stage because they have received information in the subpart OOOO annual reports that control was not possible or necessary because there was insufficient gas to route to a control device. Further, to ensure that emissions are not unnecessarily vented, the commenter supports the EPA's establishment of clear criteria for determining when there is sufficient gas to operate the separator, as well as the delineation between the initial and separation flowback stages. The commenter is concerned that without additional, clear criteria, operators will unnecessarily vent rather than control emissions. The commenter, therefore, requests that the EPA clarify the criteria for reversion to initial flowback stage from separation flowback stage when the recoverable gas present in the flowback becomes insufficient to maintain operation of the separator.

Response: As stated above, under the final rule, the second stage, defined as the ''separation flowback stage,'' begins when the flowback is routed to the separator, which is required unless it is technically infeasible. The issues raised by the commenter are discussed in depth in sections III.A and IV.A.

Comment: One commenter expressed concern with the proposed definition of the separation flowback stage which states that ''the separation flowback stage ends when the production stage begins or when the well is shut in, whichever is first.'' The commenter contends that the well shut in provision should be removed. The commenter states that in a typical well completion operation, prior to commencing production, the well may be shut in to remove the flowback equipment and install production equipment. In some instances, the well may be temporarily shut in for other purposes such as making adjustments or performing unexpected maintenance on the flowback equipment. Following these activities, the well is re-opened and separation flowback may resume. According to the commenter, the proposed rule would consider the well in the ''production stage'' when the well is shut in regardless of whether it actually enters into production or returns to the flowback process after temporary shut in. The commenter believes it is more accurate for the rule to state that the end of the separation flowback stage occurs when production (not the ''production stage'') begins. The commenter provides suggested revisions to the definition for *separation flowback stage.*

Response: The EPA agrees with the commenter that a well may be shut in for various reasons and that shut in alone does not necessarily depict the point of transition into production. As described in detail in section IV.A, there are other conditions such as having the temporary flowback equipment disconnected that indicate the end of flowback that should be taken into account in combination with well shut in. Further, although this commenter did not raise this issue, as discussed in an earlier response, sometimes operators can startup production without shutting in the well by running the temporary flowback equipment in parallel with the permanent flow line such that they can open the valve from the wellhead to the flow line and close the valve from the wellhead to the temporary flowback equipment, and isolate the temporary equipment for removal. As a result, the well is not shut in, but the temporary flowback equipment would be removed. In such cases, production had started without well shut in. In light of the above, in the final rule, we have defined the ''separation flowback stage'' to include two sets of criteria which identify the end of the separation flowback stage. The new definition indicates that the end of the separation flowback stage ends at the startup of production, or when the well is shut in and permanently disconnected from the flowback equipment. Therefore, a shut in condition of the well alone will not be considered the end of the separation flowback stage so long as flowback

equipment is still connected and production has not begun.

Comment: One commenter points out that there is a point at which gas can be separated from fluids, but the gas is not yet of salable quality. The commenter recommends that the EPA allow flaring of non-sales quality gas because it cannot be recovered and sold, and recommends that § 60.5375 be amended to refer to "salable quality" gas from the gas outlet of the separator and similar changes to the definitions of "production stage," "recovered gas" and "reduced emissions completion" in § 60.5430.

Another commenter states that § 60.5375(a)(2) specifies only one of the suitable options for salable quality recovered gas. The commenter suggests that this section be modified to say "all salable quality recovered gas must be routed to a gas flow line or collection system, re-injected into the well or another well, used as an onsite fuel source, or used for another useful purpose that a purchased fuel or raw material would serve." Alternatively, this paragraph could be deleted in that it is redundant given § 60.5375(a)(1)(ii).

Response: The EPA agrees with the commenter's assertion that some gas recovered during the separation flowback stage may not be of salable quality. The NSPS defines "salable quality gas" as "natural gas that meets the flow line or collection system operator specifications, regardless of whether such gas is sold." It is our intent to prohibit the direct venting of any gas during the separation flowback stage. However, because we are aware that not all recovered gas is of salable quality, the final rule requires an operator to route all salable quality recovered gas from the separator to a gas flow line or collection system, re-inject the recovered gas into the well or another well, use the recovered gas as an on-site fuel source or use the recovered gas for another useful purpose that a purchased fuel or raw material would serve. However, if, during the separation flowback stage, it is infeasible to route the recovered gas to a flow line or collection system, reinject the gas or use the gas as fuel or for other useful purpose, the recovered gas must be combusted. No direct venting of recovered gas is allowed during the separation flowback stage.

We believe these options effectively address all gas conditions (salable or non-salable) encountered during the separation flowback stage. For example, should the gas not meet minimum quality standards for entering the gathering system, we believe that would render collection "infeasible" until such time that the quality of the gas had improved and was acceptable. As a result, the non-salable quality gas would be combusted.

Comment: Several commenters point out that § 60.5375(a)(1)(ii) allows limited options on how liquids from the separator must be handled. According to the commenters, condensate is not always sent to a storage vessel at the well site during production, but rather is routed to a condensate or mixed well stream line and piped to another location. Sometimes the condensate is piped to a central processing facility or tank battery, and sometimes it is piped to a condensate stabilization facility where the condensate is heated and stabilized at a lower vapor pressure prior to going to a condensate tank so as to avoid flashing in the tank. One commenter states that in the Eagle Ford shale play they often elect to install blowcase units to maximize condensate recovery and to enable the direct routing of recovered liquids from the separator to a condensate collection system. This design and practice would, according to the commenter, eliminate or reduce the need for atmospheric storage vessels. According to the commenters, the proposed rule's requirement that recovered liquids must be routed to a storage vessel could be misinterpreted by regulatory agencies to not allow for companies to pipe the condensate to another location. For the separation flowback stage, paragraph § 60.5375(a)(1)(ii) should be revised to clarify that liquids may be routed to a collection system.

Response: It is the EPA's intention to allow any innovative management practice for these materials that encourages resource conservation, gas recovery and emissions reductions. We agree that routing liquids to centralized collection systems mentioned by the commenter is an innovative approach that results in reduced emissions, since the liquids are conveyed to the central facility through closed pipes, reducing emissions. The commenter mentioned production, and also cited the provisions for the separation flowback stage at § 60.5375(a)(1)(ii). We believe that collection systems should be allowed as one of the options for handling liquids during flowback and during production. In light of the comments received and our belief that centralized collection systems are protective of the environment, the final rule requires that during the separation flowback stage, all liquids from the separator must be directed to one or more well completion vessels or storage vessels, routed to a collection system or be re-injected into the well or another well. To further clarify this requirement, we have added a definition for "collection system" in § 60.5375 as set forth in the regulatory text of this rule.

Comment: One commenter expresses concern that allowing liquids from the separator to be routed to a well completion vessel, which as defined in the proposed rule includes lined earthen pits and as described in the proposal preamble includes open top frac tanks, may allow the release of emissions from recovered gas and other hydrocarbons. The commenter requests that the EPA clarify that the use of "well completion vessels," like the use of "storage vessels," during the separation flowback stage, will not result in emissions from recovered gas or other hydrocarbons.

Response: Because of the high volumes of liquids encountered during flowback, both in the initial flowback stage and in the separation flowback stage, we believe it is appropriate to route flowback liquids to a well completion vessel. Flowback consists largely of water both from the fracturing operation and water produced from the formation. In addition, such high volumes potentially could cause damage to sealed and controlled storage vessels which operate essentially at atmospheric pressure and are not designed to handle elevated pressures that could be caused by surges. Although we understand that there may be some emissions from these vessels, our intent in the well completion requirements of the NSPS is to require practices that will minimize releases to the atmosphere and maximize resource recovery, such as separation and collection of gas from the flowback unless it is technically infeasible for the separator to function and requiring gas that cannot be routed to the flow line to be combusted.

Comment: One commenter contends that limiting exceptions to the REC requirement is important, given that flaring of completion emissions represents a waste of natural resources and results in emissions of nitrogen oxides (NO_X) and carbon dioxide (CO_2) that offset the benefits of methane and VOC reduction. In this regard, the commenter is concerned that the proposed amendments continue to allow for excessive combustion of completion emissions, instead of the use of REC, when the producer deems it "infeasible" to capture completion emissions for sale or beneficial use.

The commenter believes that the proposed amendments would not only preserve this vague exception, but also problematically include preamble text suggesting that a producer can invoke

the exception in circumstances that are contrary to the original intent of subpart OOOO. The commenter contends that in the preamble to the final rule promulgating subpart OOOO, the EPA explained its ''understanding'' that producers ordinarily ''plan their operations . . . to ensure their product has a viable path to market before completing a well,'' and that combustion in lieu of a REC would only be necessary in ''isolated cases.'' However, the preamble to the current proposed rule indicates that a REC could be deemed ''infeasible'' merely because ''there [is] no flow line or other infrastructure available at the site for collection of the gas.'' This preamble text implies that the ''infeasibility'' exception could be used for logistical reasons or for the convenience of the producer, rather than in ''isolated'' cases where inherent characteristics of the completion prevent the capture of emissions for sale or beneficial use.

Accordingly, the commenter urges the EPA to either eliminate or expressly limit the scope of the infeasibility exception in the final rule to ensure that it is consistent with the original structure and intent of subpart OOOO and is not used inappropriately. Specifically, the commenter recommends that the EPA include regulatory text clarifying that collection of completion emissions in the separation flowback stage is required unless it is technically infeasible due to inherent characteristics of the flowback or unexpected conditions, not for logistical reasons that are within the control of the operator. The commenter believes this clarification would provide operators the flexibility to use combustion instead of REC when necessary, while ensuring that combustion is an option of last resort.

Response: We agree with the commenter that the intent of the rule is to minimize completion emissions during the separation flowback stage and to maximize recovery of the gas to the flow line. The final rule requires the operator to route the recovered salable gas to a gas flow line or collection system, re-inject the recovered gas into the well or another well, use the recovered gas as an on-site fuel source or use the recovered gas for another useful purpose that a purchased fuel or raw material would serve. If, during the separation flowback stage, it is infeasible to route the recovered gas to a flow line or collection system, reinject the gas or use the gas as fuel or for other useful purpose, the recovered gas must be combusted. No direct venting of recovered gas is allowed during the separation flowback stage.

While we understand the commenters concern about using the infeasibility provision to combust recovered gas when a flow line is not available, we point out that these are gas wells drilled for the production of gas; therefore the operator will have planned to be able to produce the well commercially by having the infrastructure in place and will generally avoid completing wells when it is known that the infrastructure to collect the gas and route it to market will not yet be available. However, there will be cases, though we believe to be rare, in which the operator, for reasons not within his or her control, is unable to acquire access to a flow line in time for the well completion due to unforeseen circumstances.

Comment: Several commenters took issue with the inclusion of the production stage as part of the overall well completion operation. The commenters contend that inclusion confuses or contradicts other provisions that explicitly are applicable to well completion operations and not to a well in production. The commenter believes it is critical that the rule identify when the flowback period ends and clarify that the requirements for well completions do not extend beyond the end of the flowback period.

For the commenter, the problems arise in the provisions of § 60.5375(a)(1)(iii) and in the definition of ''production stage.'' Paragraph 60.5375(a)(1)(iii) specifies requirements for the production stage, yet this paragraph is a subparagraph of § 60.5375(a), which is expressly applicable to well completion operations. Further, the commenter states that, in the proposed rule, while the beginning of the production stage marks the end of well completion operations, § 60.5365(e) indicates that the beginning of the production stage also marks the commencement of the period for determining storage vessel applicability. The commenter believes that there should be no requirements applicable to production following the end of flowback in this paragraph. One of the commenters believes that the EPA's intent of including the production stage is to ensure a storage vessel emissions evaluation occurs immediately upon the start of production. However, the commenter points out that storage vessel requirements in § 60.5365(e) already dictate that an emissions evaluation must begin at startup. Any such requirements for storage vessels should be specified in applicable portions of § 60.5365 and § 60.5395.

The commenter believes the definition of production stage requires some editing in order to be consistent with the intent that requirements for well completion operations end when production begins. The commenters make several recommendations to the change of the terms ''production stage'', and editing of other provisions to minimize any misinterpretation of the term ''production'' in well completion operations requirements. The commenter also recommends that the last sentence of § 60.5375(a)(1)(ii) be deleted and replaced with language indicating to the effect that ''the separation flowback stage ends and production begins when flow resumes after flowback equipment is removed from the well and flowback crews are released.'' See the Response to Comments Document for a full discussion of these comments.

Response: The EPA agrees with the arguments presented by the commenter regarding confusion and opportunity for misinterpretation of well completion requirements to be applicable during production. It is not the intent that rule provisions for well completions and the flowback period be applicable to the well during production over the lifetime of the well. As such, the final amendments do not include the term ''production stage'' or its definition. All references to ''production stage'' in the proposed amendments have been removed or changed to ''startup of production'' in the final amendments. Accordingly, the well completion requirements do not carry over beyond the end of the flowback period.

Comment: One commenter notes that they have many wells that go straight to the production stage, as defined in the proposed rule. The gas is recovered to a gathering line, but the liquids (produced water) are routed to a portable frac tank and then to either additional frac tanks or a lined earthen retention pond for storage. In some cases, the commenter states that the produced water is routed to the frac tanks because state regulations do not allow produced water to be routed directly to lined earthen retention ponds. The commenter also contends that routing the produced water to the frac tank also provides for better flow measurement and better control of flow into the retention pond, as well as allowing for additional sediment deposition and recovery within the frac tank. The produced water is then reused/recycled in subsequent well completions, reducing fresh water demands.

The commenter is concerned that if the proposed rule is finalized, they would be prohibited from using frac tanks and lined earthen retention ponds

(well completion vessels) to recover and reuse produced water upon entering the production stage for those wells that go directly to the production stage (for these wells, upon commencing flowback). The commenter does not believe it was the EPA's intent to adversely impact water reuse and recycling practices and requests that in the final rule, ''well completion vessel'' should be included in the standards for the production stage.

The commenter understands that the EPA may have concerns over allowing the use of well completion vessels during the production stage due to the potential for VOC emissions. However, according to the commenter in the shale gas plays where the gas composition contains either no or negligible amounts of hydrocarbons, the resultant VOC emissions would be negligible as well. The commenter suggests that the EPA consider exempting shale gas flowback liquids from being required to be routed to a storage vessel on the basis of hydrocarbon gas composition and negligible VOC emissions.

Response: As stated previously, the final amendments do not include the term ''production stage'' or the associated well completions requirements that were in the proposed amendments. The final rule, as amended, states that flowback period ends when either the well is shut in and well completion equipment is removed from the well, or that production has started. With respect to the types of wells identified by the commenter, these wells would be subject to the same requirements as other wells. However, we disagree with the commenter that these wells enter directly into production, since apparently there is water from the flowback that is separated from the gas and routed to frac tanks. As a result, such wells may not go through the initial flowback stage but would enter the separation flowback stage. We remind the commenter that, even if there is no initial flowback stage or separation flowback stage as defined by the rule, then the requirements of § 60.5375(a)(2) through (4) still apply. It should be noted that there is nothing in the rule that prohibits the use of the types of structures which would be well completion vessels during the initial and separation flowback stage for the life of the well; however, once the well has begun production, the vessels then become ''storage vessels'' under the rule if they continue receiving liquids from the well for a period exceeding 60 days from startup of production. Accordingly, they would be subject to the same VOC PTE determination and, if PTE was at least 6 tpy, would be subject to the cover, closed vent system and control requirements.

2. Definition of Low Pressure Gas Well

In the 2012 final rule, we had included a definition of ''low pressure gas well.'' This was added as a logical outgrowth of the public comments received on the August 23, 2011 proposed rule (76 FR 52738) that asserted that due to the reservoir pressure, well depth and gathering line pressure, it was infeasible to perform an REC for some wells. We developed a definition based on well parameters taking into account fluid mechanics and other engineering principles. Development of the definition was described in detail in the Technical Support Document for the final rule which is in the docket. Following publication of the final rule, we received petitions that asserted that we had not provided the public an opportunity to comment on the definition. We proposed the definition in our July 2014 proposed amendments to provide the public an opportunity to comment. We also presented and solicited comment on an alternative definition provided by the petitioners.

Comment: Two commenters appreciate the EPA's willingness to propose for further comment the definition of ''low pressure gas well'' found at § 60.5430. The EPA noted that an alternative definition that was submitted for its consideration by industry petitioners was ''a well where the field pressure is less than 0.433 times the vertical depth of the deepest target reservoir and the flowback period will be less than 3 days in duration.'' The commenters support the alternative definition, although one of the commenters suggests that the word ''initial'' should be placed before the word ''flowback'' so that it is clear that the three-day period in the definition refers to the initial flowback period, and does not include the separation flowback. This commenter adds that this definition is one that is consistent with the manner in which low pressure wells are generally described in the Appalachian Basin, is easier to use and is not as susceptible to misunderstanding.

Response: In the proposed rule we solicited comment on the alternative definition suggested by the petitioners and on specific concerns or questions we have with respect to the alternative definition. We received no comments that provided any data or other information that would lead us to conclude that the alternative definition is sufficient to predict whether an REC would be infeasible for wells meeting the alternative definition.

As explained in the proposal, we agree with the petitioners that this alternative definition is straightforward and easy to use. However, we are concerned that it may be too simplistic and may not adequately account for the parameters that must be taken into account when determining whether a REC would be feasible for a given hydraulically fractured gas well. Further, we question how an operator would know before flowback begins that the flowback period would be less than 3 days in duration.

We believe that, to determine whether the flowback gas has sufficient pressure to flow into a flow line, it is necessary to account for reservoir pressure, well depth and flow line pressure. In addition, it is important for any such determination to take into account pressure losses in the surface equipment used to perform the REC. The EPA's definition in the rule was developed to account for these factors.

We further disagree with the petitioners' assertion that the EPA definition is too complicated. We believe that values for each of the three parameters discussed above and used in the EPA definition are known by operators in advance of flowback and that the relatively simple calculation called for in the EPA definition could be performed with a basic hand-held calculator and should not pose difficulty or hardship for smaller operators. For these reasons, we are finalizing the definition of ''low pressure gas well'' as proposed.

Comment: A commenter concurs with the industry's alternate definition presented in the previous comment. The commenter explains that typical gas wells in Kentucky are produced from low pressure reservoirs with low permeability. In order to make them economically productive, they are stimulated with treatments that contain very little fluid. According to the commenter, all Devonian Shale wells—the largest producing reservoir in eastern Kentucky—are currently treated using straight nitrogen. Most nitrogen flowbacks require a minimum of 3 days before there is a sufficient volume of natural gas to route and flare with a combustion device. Fluid treatments or ''foamed'' fluid are almost certain to damage the formation's permeability, negating the opportunity for Kentucky's producers to continue developing that region's significant resources.

The commenter states that the current EPA definition of a ''low pressure well'' is based upon the physical characteristics of a reservoir, which is

then compared to the poorly defined "flow line pressure at the sales meter." Typical gathering systems in eastern Kentucky are low pressure—typically below 100 psi with the overwhelming majority below 50 psi. This makes qualifying as a "low pressure well" under the current definition almost impossible in Kentucky.

According to the commenter, if a Devonian Shale well cannot be qualified as "low pressure" after January 1, 2015, Kentucky operators will be denied the option of stimulating gas wells with an "inert" gas such as nitrogen. Without the "low pressure" qualification, the requirement of a green completion eliminates the ability to flow the wells back to the atmosphere to remove the nitrogen used in the stimulation. The commenter predicts that drilling in Kentucky's Appalachian region will cease unless the EPA adopts the proposed alternative "low pressure well" definition.

Response: We believe the commenter may be misinterpreting the proposed rule. The commenter appears to interpret the rule language as requiring liquids to be used for stimulating the well. This is not the case. The owner or operator is free to use any stimulation procedure so long as the handling of the liquids and gases released from the well follows the rule's provisions.

Based on the comment, it appears that there will be essentially little or no liquids discharged from these wells during the completion process, and that the initial flowback period would consist of the period of nitrogen flowback that precedes the production of natural gas. There is nothing in the NSPS that prohibits venting of nitrogen. However, any liquids that are discharged would have to be handled as specified in the rule. The commenter does not appear to be concerned about these rule provisions.

The problem appears to be related to the rule provisions that require the operator to route the recovered gas to a gas flow line or collection system, re-inject the recovered gas into the well or another well, use the recovered gas as an on-site fuel source or use the recovered gas for another useful purpose that a purchased fuel or raw material would serve. As explained above, the final amendments clarify that during the initial flowback stage, gas may be vented. It appears that the types of completions discussed by the commenter do not have a separation flowback stage (based on the limited recovered liquids), and once the nitrogen stimulation gas is off-gassed, the well goes directly to production. If this is the case, there should not be excessive back pressure introduced by the separator and other flowback equipment that would overly impede gas flow, which was the situation the EPA was intending to avoid by providing exemptions for low pressure gas wells. As a result, as described by the commenter, we believe that such wells do not need a low pressure well exemption to enable them to be completed and to startup production. We note that, even if there is no initial flowback stage or separation flowback stage as defined by the rule, then the completion is still subject to the requirements of § 60.5375(a)(2) through (4).

If completion operations on these wells do in fact involve a separation flowback stage, then § 60.5375(a)(1)(ii) would apply, meaning that during the separation flowback stage, all salable gas must be routed to the flow line and that, if it is infeasible to route the recovered gas to a flow line or collection system, reinject the gas or use the gas as fuel or for other useful purpose, the recovered gas must be combusted. No direct venting of recovered gas is allowed during the separation flowback stage.

In the case of the Devonian shale wells, we understand that the initial gas flow is predominantly nitrogen which is not combustible. However, based on the initial flowback provisions under the final rule, these gases would be allowed to be vented during initial flowback. It is assumed that as the nitrogen stimulant gas is released from the well, the hydrocarbon proportion of recovered gas will continually increase and eventually become combustible. Therefore, based on the above rationale, we do not agree that these wells should be specifically exempted as low pressure wells.

B. Storage Vessels

Comment: One commenter believes the proposed definition of "removed from service" is too narrow. The commenter suggests that a storage vessel affected facility should be considered removed from service if it no longer meets the definition of a storage vessel, regardless of whether it is physically isolated and disconnected from the process. As proposed, the commenter contends that the rule addresses only a single scenario when a storage vessel is no longer used to store any materials. However, there are many other scenarios where a storage vessel affected facility may still be used for storage but no longer meets the definition of storage vessel and would thus no longer be subject to the rule requirements. Examples of such scenarios provided by the commenter include an atmospheric condensate tank converted to methanol storage or non-VOC storage which may need to be connected to the process; a bullet tank previously operated as an atmospheric condensate tank for which its service is subsequently changed to pressurized storage of butane and is connected to the process; and a bullet tank previously operated as an atmospheric produced water tank and which its service is subsequently changed to a surge control process vessel and is connected to the process.

For the scenario where a storage vessel is no longer used to store anything, the commenter contends that the language regarding physical isolation and disconnection is not necessary because the definition of storage vessel states, "vessel that contains an accumulation of crude oil, condensate, intermediate hydrocarbon liquids, or produced water . . ." Thus, if those materials were to again enter the storage vessel, the vessel would be "returned to service" and subject to the applicable requirements. The commenter points out that in the unique scenario where a storage vessel is no longer used to store anything, physical isolation is sufficient; disconnection should not be required if, for example, blind flanges are installed. The commenter suggests several changes to the definition of removed from service to cover all scenarios where a storage vessel may no longer meet the definition of storage vessel for purposes of subpart OOOO, but is still used for storage of liquids not included in the definition of "storage vessel."

Another commenters recommends that the EPA separate the definition of returned to service from the definition of removed from service and provided suggested language.

Response: We agree that the proposed definition of "removed from service" did not sufficiently address the many scenarios identified by the commenters. In particular, the scenario where a storage vessel affected facility is removed from service for a period of time and then returned to service for some purpose was not clearly addressed under the proposed rule. As discussed further in section IV.B of this preamble, we have revised the definition of "removed from service" and added a definition for "returned to service."

Comment: Several commenters do not support the concept of a storage vessel maintaining its subpart OOOO applicability status when that storage vessel is relocated to a different well site. One commenter stated that storage vessel PTE at a previous location is irrelevant to the new location and is entirely dependent on the particular

type of service for which the vessel is being used at the new location. The commenters point out that the emissions from storage vessels are not related to the equipment itself, but rather the characteristics and volume of the fluids being sent to and stored in the storage vessel.

As proposed, the commenters believe that the rule could require an operator to control a storage vessel with little actual emissions and could discourage the replacement of older damaged storage vessels with newer vessels that may have come from a location that had emissions above the 6 tpy threshold. One commenter concurred that applicability should be based on the type of liquids introduced into the relocated storage vessel and the emissions, not just the type of liquids. The commenters seek confirmation that applicability of storage vessels is triggered by the addition of crude oil, condensate, produced water or intermediate hydrocarbon liquids to the vessel and the unique production of the new location, rather than by simply moving the vessel to a new location.

The commenters believe the proposed rule requirements are further complicated if the out-of-service storage vessel is sold to another owner or operator as part of the relocation. "Tank pedigree" tracking would quickly become unduly burdensome. The commenter agrees that if the vessel's emissions are above 6 tpy at the new location, it should be fully subject to the rule. The commenters believe that the tracking and recordkeeping burden of having to assess different emissions thresholds on different affected facility storage vessels based solely on their movement within the company is an excessive and unrealistic burden, particularly where the storage vessel emissions are less than 6 tpy at the new location. At this point, according to the commenters, the tank is no longer a storage vessel affected facility and should not be subject to the rule's requirements, including annual reporting, regardless of whether the storage vessel's previous owner/operator used the vessel in a service at a different location and facility, which resulted in emissions sufficient to trigger rule applicability. Unless the storage vessel's emissions are above 6 tpy at the new location, the commenters contend that subpart OOOO requirements should not be imposed on a relocated storage vessel.

One commenter requests that controls only be required when that relocated tank's emissions exceed 6 tpy, and not merely 4 tpy as required in § 60.5395(f)(2)(ii)(B). The commenter does not understand why the initial emissions assessment should be different for a relocated storage vessel compared to a newly constructed storage vessel. The commenter states that the hydrocarbon composition flowing through the relocated storage vessel may be significantly different at the new location, and the owner or operator of the storage vessel should not be penalized with a lower emissions threshold. The commenter points out that a storage vessel affected facility is defined as "a single storage vessel . . . that has the potential for VOC emissions equal to or greater than 6 tpy . . . [taking] into account requirements under a legally and practically enforceable limit . . ." The commenter contends that by requiring a 4 tpy threshold for relocated affected facility storage vessels, the EPA is effectively requiring control devices on storage vessels that have emissions below the threshold that is cost effective to control. Therefore, the commenter contends that a 4 tpy threshold for relocated affected facility storage vessels is legally unsupportable.

Finally, another commenter seeks clarification on the requirements for storage vessels that are returned to service at the same location. In the September 23, 2013 final rule amendments, the EPA added requirements at § 60.5395(f)(2)(ii)(B), which states that "[i]f the uncontrolled VOC emissions without considering control from your storage vessel affected facility are 4 tpy or greater, you must comply with paragraph (d) of this section within 60 days of returning to service." However, the commenter points out that storage vessel affected facilities returned to service with uncontrolled emissions less than 4 tpy are not addressed and the commenter seeks clarification of this issue.

Response: We agree with the commenters' assertion that the emissions from a storage vessel are not intrinsic to the vessel but are a result of the operation and service to which the storage vessel is connected. We have provided a detailed discussion of this issue and the final amendments for storage vessels that are removed from service and returned from service in section IV.B.

Comment: Several commenters expressed general support for allowing the use of electronic spark ignition systems on combustion control devices, although many of the commenters also suggested modifications to the proposed requirements.

One commenter notes that Colorado's Regulation Number 7 requires all combustion devices used to control hydrocarbon emissions utilize an auto-igniter to ensure the operation of the continuous flame pilot. During the adoption of this requirement, the Colorado Air Quality Control Commission determined that auto-igniters were a cost-effective method to reduce hydrocarbon emissions. Another commenter notes that the Fort Berthold Indian Reservation Federal Implementation Plan allows for the use of continuous pilots or automatic spark igniters.

Three commenters note that in the Natural Gas STAR program, the EPA published a Partner Recognized Opportunity (PRO) in PRO Fact Sheet No. 903 that discusses the operation and benefits of electronic spark ignition systems. The commenter contends that the EPA should not lose the benefits of this control technology enhancement by disallowing its use in this rule. With this being an established technology in Natural Gas STAR, the commenters do not believe operators should have to petition the EPA for approval under its new control technology provision. The commenters request that the rule be modified to explicitly allow the use of electronic spark ignition systems as an alternative to a continuous pilot flame.

The commenters add that in the arctic environment in Alaska, operators have often encountered situations where, following maintenance on a flare, a new spark igniter with frost buildup cannot re-light the flare pilot. Continuous pilot flames are required for safety and certainty of combustion in arctic Alaska. Therefore, the commenters contend that if an electronic spark ignition system is allowed, it needs to be an option, rather than a requirement. Two other commenters agree that it should only be an option.

One commenter believes that spark ignition systems may be most appropriate for flares which only occasionally operate (such as flares to handle mishap/safety shutdowns, maintenance blowdowns, etc.) and flares that operate more or less continuously, such as a flare for a wet seal compressor seal-degassing unit. In both cases they may be more reliable than a pilot light, since spark ignition systems cannot be blown out and do not consume fuel and increase emissions, as a pilot light does. However, the commenter contends that a spark ignition system should not be the sole ignition mechanism for flares with highly variable flow, such as flares associated with well completion flowback or storage tank control systems. The commenter states that variable flow can lead to sputtering flames, and a failure to burn all the gas

directed to the flare, leading to large emissions of VOC and methane from the flare. The commenter is concerned that a spark ignition device may not restart the flare as rapidly as a pilot light in such situations, which could lead to higher emissions for flares on variable flow sources such as wells and storage tanks. Given the high rate of emissions of VOC and methane during flowback flaring, it would be appropriate to require both pilot lights and spark ignition devices.

One commenter adds that although they believe electronic spark ignition systems should be allowed as an option, the EPA has not provided any evidence or data to suggest that pilots do not remain continuously lit during operation in the applications used for compliance with this rule. Nor has the EPA provided any data on potential environmental benefit of such technology. The commenter also contends that safety implications must be seriously considered when using auto-igniters. When use is appropriate, operators must be able to tailor the auto-igniter configuration and operation to the combustion device, the facility design, the flammability of the waste stream, facility operations and applicable industry standards. The commenter states that the EPA should not attempt to create a blanket mandate for the application or operation of auto-igniters since safety risks must be evaluated, often on a case-by-case basis. Auto-igniters may not be appropriate or allowed in current industry standards for all applications (such as heaters, boilers, and enclosed combustors). The commenter provides details of safety concerns related to electronic spark ignition systems in their comments.

Two commenters recommend that electronic spark ignition systems have fail safe systems such as temperature and pressure monitoring to prevent any venting during periods when vapors are flowing to the device.

One commenter points out that electronic spark ignition systems have been available for over twenty years and have a proven track record of successfully and safely lighting and maintaining flares and fuel burning equipment.

Response: In our response to comments on the 2011 proposed rule, we stated that given the intermittent and inconsistent nature of emissions from storage vessels in this industry combined with the highly variable VOC concentration in the emissions, we did not believe at that time that a spark-ignited flare would achieve the same level of emission reduction as a flare with a continuous flame present.

In the July 17, 2014, proposed rule, we solicited information, including any test data or other documentation, that may help address the following topics relative to the operation of an electronic spark ignition: (1) Appropriate design, operation and maintenance procedures to ensure proper combustion of the waste stream; (2) use of safety valves to ensure that no gas is available for combustion if the ignition system is not functional; (3) measures that could be taken to avoid vapor venting upstream of the control device in cases where the safety valve remains closed; (4) frequency of monitoring for proper operation; (5) specific checks to be made to ensure proper operation; (6) operating parameters that affect pilot-less flare performance and flare flame stability; (7) effects of gas with low BTU content or gas of variable VOC content; and (8) how often these systems need to be replaced.

In addition, we were interested in information on the use of this technology as a means of ensuring that continuous flame pilots remain functional at all times. Therefore, we also solicited comment, including any supporting data or information, on whether automatic spark ignition relighting systems should be required as a means of ensuring that continuous flame pilots remain functional at all times.

Although we received some information, we received no data in response to most of the questions we asked that would help us determine that electronic spark ignition should be allowed as an alternative to a continuous pilot flame.

Accordingly, issues and concerns related to intermittent and inconsistent flow still remain. Specifically, we remain concerned with how quickly an electronic spark ignition system will ignite an emission stream from an intermittent and inconsistent emission source. We also remain to have concerns about flame stability.

In light of the comments received and the lack of information received in response to our solicitation, we are not satisfied at this time that we have sufficient information on which to base a decision to allow electronic spark ignition as an alternative to a continuous pilot flame.

C. Routing of Reciprocating Compressor Rod Packing Emissions to a Process

Comment: One commenter expressed support for the EPA's proposal to allow reciprocating compressor rod packing emissions to be routed to a process. However, the commenter claims that they cannot comply with the structure of the requirements as proposed. Also, the commenter contends that the proposed requirements do not conform to the current structure of the rule. The commenter recommends several changes:

First, the commenter states that proposed § 60.5385(a)(3) references initial compliance requirements with § 60.5411(a) and (b), which is unnecessary and inconsistent with § 60.5385(a)(1) and (2). The commenter also believes it is inconsistent with the rule's structure for other affected facilities.

Second, the commenter states that the EPA is not proposing to modify § 60.5410(c)(1) (initial compliance requirements) which states "[d]uring the initial compliance period, you must continuously monitor the number of hours of operation or track the number of months since the last rod packing replacement." The commenter contends that reciprocating compressor affected facilities complying with § 60.5385(a)(3) cannot comply with this requirement. Thus, the commenter believes that this requirement must be revised. Additionally, the commenter contends that there is not an initial compliance requirement here for compressors complying with § 60.5385(a)(3); thus, it would be inappropriate to reference the § 60.5411(a) and (b) requirements.

Third, the commenter states that in the proposed continuous compliance requirements in § 60.5415(c)(4), the EPA proposes to reference the initial compliance requirements in § 60.5411(a) and (b). The commenter contends that this does not make sense and does not conform to the changes that the EPA is also proposing at § 60.5416(a) and (b) (continuous cover and closed vent system requirements).

Fourth, the commenter states that the EPA is proposing to make § 60.5416(a) and (b) (continuous cover and closed vent system requirements) applicable for reciprocating compressors; however, the recordkeeping requirements associated with § 60.5416(a) and (b) have not been modified to conform to this proposed change. Additionally, the commenter believes § 60.5420(c)(6) currently fails to reference § 60.5416(a)(2). The commenter recommends that the EPA take this opportunity to resolve this oversight.

One commenter does not believe that the proposed application of the closed vent system requirements to reciprocating compressors or the routing of the rod packing equipment through a closed vent system to a process in § 60.5385(a)(3) are appropriate alternatives.

Response: The EPA disagrees with several aspects of the comments but also agrees with certain suggestions. The commenter states that the reference in § 60.5385(a)(3) to § 60.5411(a) and (b) is not necessary. The EPA disagrees with this comment, because we consider it necessary to specify the standards to which a closed vent system and cover must be designed and operated to achieve the emission reductions sought by the rule.

The EPA disagrees with the comment that the reference to § 60.5411(a) and (b) make it inconsistent with § 60.5385(a)(1) and (2). Neither § 60.5385(a)(1) nor (2) relies on additional equipment (*e.g.,* covers and closed vent systems) to be operated properly to obtain the required emission reductions. Therefore, no such reference is needed in § 60.5385(a)(1) or (2).

The EPA agrees that compliance with 60.5410(c)(1) is intended for owners and operators that have not exercised their option to comply with 60.5385(a)(3), and has finalized language to that effect suggested by the commenter. The EPA has added a restrictive clause to § 60.5410(c) such that § 60.5410(c)(1) through (4) apply only to sources electing to comply with § 60.5385(a)(1) and (2). We made this change because several of the provisions of § 60.5410(c)(1) through (4) are inappropriate for affected facilities that have chosen to comply with § 60.5385(a)(3) rather than (a)(1) and (2).

The EPA agrees that owners and operators that route rod packing emissions to a process under § 60.5385(a)(3) are not subject to § 60.5410(c)(1). We have amended § 60.5410(c) to specify that owners and operators using closed vent systems and covers are not subject to § 60.5410(c)(1).

The commenter states that requirements in § 60.5411(a) and (b) are initial compliance requirements and should not be referenced in the continuous compliance requirements of § 60.5415(c)(4). The EPA disagrees with the commenter because there are requirements within § 60.5411(a) and (b) that require compliance beyond initial compliance. Therefore, we believe it is necessary to specify continuous compliance with § 60.5411(a) and (b).

The commenter states that § 60.5416(a) and (b) should be qualified so as to apply only the reciprocating compressors subject to § 60.5385(a)(3). The EPA agrees with this comment and has added language to make this change.

The EPA agrees that § 60.5415(c)(4) is intended to describe the requirements applicable to reciprocating compressors operating under § 60.5385(a)(3) and should refer to the continuous compliance requirements applicable to closed vent systems and covers specified in § 60.5416(a) and (b).

The EPA agrees with the suggested revision of 60.5420(c) (6) through (9), and has made the changes to the regulatory text.

Comment: One commenter also expressed support for the proposed changes to § 60.5385 to allow the emissions from reciprocating compressors to be routed to a process, but believes other revisions, similar to or the same as those suggested by the previous commenter, are needed in the rule to maintain consistency with the proposed changes. The commenter's suggestions are not repeated here but are detailed in their comments.

Response: As discussed in the response to a previous comment, the EPA has made several amendments to the proposed rule language to clarify the requirements for reciprocating compressors.

VI. Technical Corrections and Clarifications

The EPA is finalizing corrections and clarifications to the 2012 NSPS and the 2013 storage vessel amendments including typographical and grammatical errors, as well as incorrect dates and cross-references. Details of the specific changes we are finalizing to the regulatory text may be found in the docket for this action.[4]

VII. Impacts of These Final Amendments

Our analysis shows that owners and operators of affected facilities would choose to install and operate the same or similar air pollution control technologies under this action as would have been necessary to meet the previously finalized standards. We project that these amendments will result in no significant change in costs, emission reductions, or benefits. Even if there were changes in costs for the affected facilities, such changes would likely be small relative to both the overall costs of the individual projects and the overall costs and benefits of the final rule. Since we believe that owners and operators would put on the same controls for this revised final rule that they would have for the original final rule, there should not be any incremental costs related to this final revision.

A. What are the air impacts?

We believe that owners and operators of affected facilities will install the same or similar control technologies to comply with the revised standards finalized in this action as they would have installed to comply with the previously finalized standards. Accordingly, we believe that this final rule will not result in significant changes in emissions of any of the regulated pollutants.

B. What are the energy impacts?

This final rule is not anticipated to have an effect on the supply, distribution, or use of energy. As previously stated, we believe that owners and operators of affected facilities would install the same or similar control technologies as they would have installed to comply with the previously finalized standards.

C. What are the compliance costs?

We believe there will be no significant change in compliance costs as a result of this final rule because owners and operators of affected facilities would install the same or similar control technologies as they would have installed to comply with the previously finalized standards.

D. What are the economic and employment impacts?

Because we expect that owners and operators of affected facilities would install the same or similar control technologies to meet the standards finalized in this action as they would have chosen to comply with the previously finalized standards, we do not anticipate that this final rule will result in significant changes in emissions, energy impacts, costs, benefits, or economic impacts. Likewise, we believe this rule will not have any impacts on the price of electricity, employment or labor markets, or the U.S. economy.

E. What are the benefits of the final standards?

As previously stated, the EPA anticipates the oil and natural gas sector will not incur significant compliance costs or savings as a result of this action and we do not anticipate any significant emission changes resulting from these amendments to the rule. Therefore, there are no direct monetized benefits or disbenefits associated with this final rule.

VIII. Statutory and Executive Order Reviews

Additional information about these statutes and Executive Orders can be

[4] Memorandum from Moore, Bruce, U.S. EPA, to Docket ID No. EPA–HQ–OAR–2010–0505, *Technical Corrections to the Oil and Natural Gas Sector New Source Performance Standards.* June 30, 2014.

found at *http://www2.epa.gov/laws-regulations/laws-and-executive-orders.*

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is not a significant regulatory action and was therefore not submitted to the Office of Management and Budget (OMB) for review.

B. Paperwork Reduction Act (PRA)

This action does not impose any new information collection burden under the PRA. OMB has previously approved the information collection activities contained in the existing regulations and has assigned OMB control number 2060–0673. Today's action does not change the information collection requirements previously finalized and, as a result, does not impose any additional information collection burden on industry.

C. Regulatory Flexibility Act (RFA)

I certify that this action will not have a significant economic impact on a substantial number of small entities under the RFA. In making this determination, the impact of concern is any significant adverse economic impact on small entities. An agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, has no net burden or otherwise has a positive economic effect on the small entities subject to the rule. The EPA has determined that none of the small entities subject to this rule will experience a significant impact because today's action imposes no additional compliance costs on owners or operators of affected sources. We have therefore concluded that this action will have no net regulatory burden for all directly regulated small entities.

D. Unfunded Mandates Reform Act of 1995 (UMRA)

This action does not contain any unfunded mandate as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. This action imposes no enforceable duty on any state, local or tribal governments or the private sector.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects 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.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. It will not have substantial direct effect on tribal governments, on the relationship between the federal government and Indian tribes or on the distribution of power and responsibilities between the federal government and Indian tribes, as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this action.

Although at proposal the EPA noted that Executive Order 13175 did not apply, the EPA solicited comment from tribes inclined to comment on the proposed action. The EPA did not receive substantive comments from tribes on our proposal.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because it is not economically significant as defined in Executive Order 12866, and because the EPA does not believe the environmental health or safety risks addressed by this action present a disproportionate risk to children.

This action does not add to or relieve affected sources from any requirements, and therefore has no impacts; thus, health and risk assessments were not conducted. The public was invited to submit comments or identify peer-reviewed studies and data that assess effects of early life exposure to HAP from oil and natural gas sector activities. The EPA received no substantive information on these risks.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not subject to Executive Order 13211 because it is not a significant regulatory action under Executive Order 12866.

I. National Technology Transfer and Advancement Act (NTTAA)

This rulemaking does not involve technical standards.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes the human health or environmental risk addressed by this action will not have potential disproportionately high and adverse human health or environmental effects on minority, low-income or indigenous populations because it does not affect the level of protection provided to human health or the environment. The basis for this determination is that this action is a reconsideration of existing requirements and imposes no new impacts or costs.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is not a "major rule" as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 60

Administrative practice and procedure, Air pollution control, Environmental protection, Intergovernmental relations, Reporting and recordkeeping.

Dated: December 19, 2014.

Gina McCarthy,

Administrator.

For the reasons set out in the preamble, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

■ 1. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C. 7401, *et seq.*

Subpart OOOO—[Amended]

■ 2. Section 60.5365 is amended by revising paragraph (e) to read as follows:

§ 60.5365 Am I subject to this subpart?

* * * * *

(e) Each storage vessel affected facility, which is a single storage vessel located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment, and has the potential for VOC emissions equal to or greater than 6 tpy as determined according to this section by October 15, 2013 for Group 1 storage vessels and by April 15, 2014, or 30 days after startup (whichever is later) for Group 2 storage vessels, except as provided in paragraphs (e)(1) through (4) of this section. The potential for VOC emissions must be calculated using a generally accepted model or calculation methodology, based on the maximum average daily throughput determined for a 30-day period of production prior to

the applicable emission determination deadline specified in this section. The determination may take into account requirements under a legally and practically enforceable limit in an operating permit or other requirement established under a Federal, State, local or tribal authority.

(1) For each new, modified or reconstructed storage vessel receiving liquids pursuant to the standards for gas well affected facilities in § 60.5375, including wells subject to § 60.5375(f), you must determine the potential for VOC emissions within 30 days after startup of production.

(2) A storage vessel affected facility that subsequently has its potential for VOC emissions decrease to less than 6 tpy shall remain an affected facility under this subpart.

(3) For storage vessels not subject to a legally and practically enforceable limit in an operating permit or other requirement established under Federal, state, local or tribal authority, any vapor from the storage vessel that is recovered and routed to a process through a VRU designed and operated as specified in this section is not required to be included in the determination of VOC potential to emit for purposes of determining affected facility status, provided you comply with the requirements in paragraphs (e)(3)(i) through (iv) of this section.

(i) You meet the cover requirements specified in § 60.5411(b).

(ii) You meet the closed vent system requirements specified in § 60.5411(c).

(iii) You maintain records that document compliance with paragraphs (e)(3)(i) and (ii) of this section.

(iv) In the event of removal of apparatus that recovers and routes vapor to a process, or operation that is inconsistent with the conditions specified in paragraphs (e)(3)(i) and (ii) of this section, you must determine the storage vessel's potential for VOC emissions according to this section within 30 days of such removal or operation.

(4) For each new, reconstructed, or modified storage vessel with startup, startup of production, or which is returned to service, affected facility status is determined as follows: If a storage vessel is reconnected to the original source of liquids; used to replace any storage vessel affected facility; or is installed in parallel with any storage vessel affected facility, it is a storage vessel affected facility subject to the same requirements as before being removed from service, or applicable to the storage vessel affected facility being replaced, or with which it is installed in parallel immediately upon startup, startup of production, or return to service.

* * * * *

■ 3. Section 60.5375 is amended by:
■ a. Revising paragraphs (a) introductory text and (a)(1) through (3);
■ b. Revising paragraph (b);
■ c. Revising paragraphs (f)(1)(i) and (ii); and
■ d. Revising paragraph (f)(2).

The revisions read as follows:

§ 60.5375 What standards apply to gas well affected facilities?

* * * * *

(a) Except as provided in paragraph (f) of this section, for each well completion operation with hydraulic fracturing begun prior to January 1, 2015, you must comply with the requirements of paragraphs (a)(3) and (4) of this section unless a more stringent state or local emission control requirement is applicable; optionally, you may comply with the requirements of paragraphs (a)(1) through (4) of this section. For each new well completion operation with hydraulic fracturing begun on or after January 1, 2015, you must comply with the requirements in paragraphs (a)(1) through (4) of this section. You must maintain a log as specified in paragraph (b).

(1) For each stage of the well completion operation, as defined in § 60.5430, follow the requirements specified in paragraph (a)(1)(i) and (ii) of this section.

(i) During the initial flowback stage, route the flowback into one or more well completion vessels or storage vessels and commence operation of a separator unless it is technically infeasible for a separator to function. Any gas present in the initial flowback stage is not subject to control under this section.

(ii) During the separation flowback stage, route all recovered liquids from the separator to one or more well completion vessels or storage vessels, re-inject the liquids into the well or another well or route the recovered liquids to a collection system. Route the recovered gas from the separator into a gas flow line or collection system, re-inject the recovered gas into the well or another well, use the recovered gas as an on-site fuel source, or use the recovered gas for another useful purpose that a purchased fuel or raw material would serve. If it is infeasible to route the recovered gas as required above, follow the requirements in paragraph (a)(3) of this section. If, at any time during the separation flowback stage, it is not technically feasible for a separator to function, you must comply with (a)(1)(i) of this section.

(2) All salable quality recovered gas must be routed to the gas flow line as soon as practicable. In cases where salable quality gas cannot be directed to the flow line, you must follow the requirements in paragraph (a)(3) of this section.

(3) You must capture and direct recovered gas to a completion combustion device, except in conditions that may result in a fire hazard or explosion, or where high heat emissions from a completion combustion device may negatively impact tundra, permafrost or waterways. Completion combustion devices must be equipped with a reliable continuous ignition source.

* * * * *

(b) You must maintain a log for each well completion operation at each gas well affected facility. The log must be completed on a daily basis for the duration of the well completion operation and must contain the records specified in § 60.5420(c)(1)(iii).

* * * * *

(f) * * *

(1) * * *

(i) Each well completion operation with hydraulic fracturing at a wildcat or delineation well.

(ii) Each well completion operation with hydraulic fracturing at a non-wildcat low pressure gas well or non-delineation low pressure gas well.

(2) Route the flowback into one or more well completion vessels and commence operation of a separator unless it is technically infeasible for a separator to function. Any gas present in the flowback before the separator can function is not subject to control under this section. You must capture and direct recovered gas to a completion combustion device, except in conditions that may result in a fire hazard or explosion, or where high heat emissions from a completion combustion device may negatively impact tundra, permafrost or waterways. Completion combustion devices must be equipped with a reliable continuous ignition source. You must also comply with paragraphs (a)(4) and (b) through (e) of this section.

* * * * *

■ 4. Section 60.5385 is amended by:
■ a. Revising paragraph (a) introductory text; and
■ b. Adding paragraph (a)(3).

The revision and addition read as follows:

§ 60.5385 What standards apply to reciprocating compressor affected facilities?

* * * * *

(a) You must replace the reciprocating compressor rod packing according to either paragraph (a)(1) or (2) of this section or you must comply with paragraph (a)(3) of this section.

* * * * *

(3) Collect the emissions from the rod packing using a rod packing emissions collection system which operates under negative pressure and route the rod packing emissions to a process through a closed vent system that meets the requirements of § 60.5411(a).

* * * * *

■ 5. Section 60.5390 is amended by revising paragraph (c)(2) to read as follows:

§ 60.5390 What standards apply to pneumatic controller affected facilities?

* * * * *

(c) * * *

(2) Each pneumatic controller affected facility constructed, modified or reconstructed on or after October 15, 2013, at a location between the wellhead and a natural gas processing plant or the point of custody transfer to an oil pipeline must be tagged with the month and year of installation, reconstruction or modification, and identification information that allows traceability to the records for that controller as required in § 60.5420(c)(4)(iii).

* * * * *

■ 6. Section 60.5395 is amended by:
■ a. Revising paragraph (d)(1)(i); and
■ b. Revising paragraph (f).

The revisions read as follows:

§ 60.5395 What standards apply to storage vessel affected facilities?

* * * * *

(d) * * *

(1) * * *

(i) For each Group 2 storage vessel affected facility, you must achieve the required emissions reductions by April 15, 2014, or within 60 days after startup, whichever is later, except as otherwise provided below in paragraph (f) of this section. For storage vessel affected facilities receiving liquids pursuant to the standards for gas well affected facilities in § 60.5375, you must achieve the required emissions reductions within 60 days after startup of production as defined in § 60.5430.

* * * * *

(f) *Requirements for Group 1 and Group 2 storage vessel affected facilities that are removed from service or returned to service.* If you remove a Group 1 or Group 2 storage vessel affected facility from service, you must comply with paragraphs (f)(1) through (3) of this section. A Group 1 or Group 2 storage vessel is not an affected facility under this subpart for the period that it is removed from service.

(1) For a storage vessel affected facility to be removed from service, you must comply with the requirements of paragraph (f)(1)(i) and (ii) of this section.

(i) You must completely empty and degas the storage vessel, such that the storage vessel no longer contains crude oil, condensate, produced water or intermediate hydrocarbon liquids. A storage vessel where liquid is left on walls, as bottom clingage or in pools due to floor irregularity is considered to be completely empty.

(ii) You must submit a notification as required in § 60.5420(b)(6)(vi) in your next annual report, identifying each storage vessel affected facility removed from service during the reporting period and the date of its removal from service.

(2) If a storage vessel identified in paragraph (f)(1)(ii) of this section is returned to service, you must determine its affected facility status as provided in § 60.5365(e).

(3) For each storage vessel affected facility returned to service during the reporting period, you must submit a notification in your next annual report as required in § 60.5420(b)(6)(vii), identifying each storage vessel affected facility and the date of its return to service.

* * * * *

■ 7. Section 60.5401 is amended by revising paragraphs (d) and (e) to read as follows:

§ 60.5401 What are the exceptions to the equipment leak standards for affected facilities at onshore natural gas processing plants?

* * * * *

(d) Pumps in light liquid service, valves in gas/vapor and light liquid service, pressure relief devices in gas/vapor service, and connectors in gas/vapor service and in light liquid service that are located at a nonfractionating plant that does not have the design capacity to process 283,200 standard cubic meters per day (scmd) (10 million standard cubic feet per day) or more of field gas are exempt from the routine monitoring requirements of §§ 60.482–2a(a)(1), 60.482–7a(a), 60.482–11a(a), and paragraph (b)(1) of this section.

(e) Pumps in light liquid service, valves in gas/vapor and light liquid service, pressure relief devices in gas/vapor service, and connectors in gas/vapor service and in light liquid service within a process unit that is located in the Alaskan North Slope are exempt from the routine monitoring requirements of §§ 60.482–2a(a)(1), 60.482–7a(a), 60.482–11a(a), and paragraph (b)(1) of this section.

* * * * *

■ 8. Section 60.5410 is amended by:
■ a. Revising paragraph (c)(1);
■ b. Adding a new paragraph (c)(2); and
■ c. Revising paragraph (d)(2) to read as follows:

§ 60.5410 How do I demonstrate initial compliance with the standards for my gas well affected facility, my centrifugal compressor affected facility, my reciprocating compressor affected facility, my pneumatic controller affected facility, my storage vessel affected facility, and my equipment leaks and sweetening unit affected facilities at onshore natural gas processing plants?

* * * * *

(c) * * *

(1) If complying with § 60.5385(a)(1) or (2), during the initial compliance period, you must continuously monitor the number of hours of operation or track the number of months since the last rod packing replacement.

(2) If complying with § 60.5385(a)(3), you must operate the rod packing emissions collection system under negative pressure and route emissions to a process through a closed vent system that meets the requirements of § 60.5411(a).

* * * * *

(d) * * *

(2) You own or operate a pneumatic controller affected facility located at a natural gas processing plant and your pneumatic controller is driven by a gas other than natural gas and therefore emits zero natural gas.

* * * * *

■ 9. Section 60.5411 is amended by:
■ a. Revising the section heading and introductory text;
■ b. Revising the heading of paragraph (a);
■ c. Revising paragraph (a)(1);
■ d. Revising paragraph (b)(3); and
■ e. Revising the heading of paragraph (c).

The revisions read as follows:

§ 60.5411 What additional requirements must I meet to determine initial compliance for my covers and closed vent systems routing materials from storage vessels, reciprocating compressors and centrifugal compressor wet seal degassing systems?

You must meet the applicable requirements of this section for each cover and closed vent system used to comply with the emission standards for your storage vessel, reciprocating compressor or centrifugal compressor affected facility.

(a) *Closed vent system requirements for reciprocating compressors and for*

centrifugal compressor wet seal degassing systems. (1) You must design the closed vent system to route all gases, vapors, and fumes emitted from the material in the reciprocating compressor rod packing emissions collection system or the wet seal fluid degassing system to a control device or to a process that meets the requirements specified in § 60.5412(a) through (c).

* * * * *

(b) * * *

(3) Each storage vessel thief hatch shall be equipped, maintained and operated with a weighted mechanism or equivalent, to ensure that the lid remains properly seated. You must select gasket material for the hatch based on composition of the fluid in the storage vessel and weather conditions.

(c) *Closed vent system requirements for storage vessel affected facilities using a control device or routing emissions to a process.*

* * * * *

■ 10. Section 60.5412 is amended by revising paragraph (d) introductory text to read as follows:

§ 60.5412 What additional requirements must I meet for determining initial compliance with control devices used to comply with the emission standards for my storage vessel or centrifugal compressor affected facility?

* * * * *

(d) Each control device used to meet the emission reduction standard in § 60.5395(d) for your storage vessel affected facility must be installed according to paragraphs (d)(1) through (3) of this section, as applicable. As an alternative to paragraph (d)(1) of this section, you may install a control device model tested under § 60.5413(d), which meets the criteria in § 60.5413(d)(11) and § 60.5413(e).

* * * * *

■ 11. Section 60.5413 is amended by:
■ a. Revising the introductory text of paragraph (e); and
■ b. Adding paragraph (e)(7).

The revision and addition read as follows:

§ 60.5413 What are the performance testing procedures for control devices used to demonstrate compliance at my storage vessel or centrifugal compressor affected facility?

* * * * *

(e) *Continuous compliance for combustion control devices tested by the manufacturer in accordance with paragraph (d) of this section.* This paragraph applies to the demonstration of compliance for a combustion control device tested under the provisions in paragraph (d) of this section. Owners or operators must demonstrate that a control device achieves the performance requirements in (d)(11) of this section by installing a device tested under paragraph (d) of this section and complying with the criteria specified in paragraphs (e)(1) through (7) of this section.

* * * * *

(7) Ensure that each enclosed combustion device is maintained in a leak free condition.

■ 12. Section 60.5415 is amended by:
■ a. Revising paragraph (b)(2) introductory text;
■ b. Revising paragraph (c) introductory text;
■ c. Adding paragraph (c)(4); and
■ d. Removing paragraph (h).

The revisions and addition read as follows:

§ 60.5415 How do I demonstrate continuous compliance with the standards for my gas well affected facility, my centrifugal compressor affected facility, my stationary reciprocating compressor affected facility, my pneumatic controller affected facility, my storage vessel affected facility, and my affected facilities at onshore natural gas processing plants?

(b) * * *

(2) For each control device used to reduce emissions, you must demonstrate continuous compliance with the performance requirements of § 60.5412(a) using the procedures specified in paragraphs (b)(2)(i) through (vii) of this section. If you use a condenser as the control device to achieve the requirements specified in § 60.5412(a)(2), you must demonstrate compliance according to paragraph (b)(2)(viii) of this section. You may switch between compliance with paragraphs (b)(2)(i) through (vii) of this section and compliance with paragraph (b)(2)(viii) of this section only after at least 1 year of operation in compliance with the selected approach. You must provide notification of such a change in the compliance method in the next annual report, as required in § 60.5420(b), following the change.

* * * * *

(c) For each reciprocating compressor affected facility complying with § 60.5385(a)(1) or (2), you must demonstrate continuous compliance according to paragraphs (c)(1) through (3) of this section. For each reciprocating compressor affected facility complying with § 60.5385(a)(3), you must demonstrate continuous compliance according to paragraph (c)(4) of this section.

* * * * *

(4) You must operate the rod packing emissions collection system under negative pressure and continuously comply with the closed vent requirements in § 60.5411(a).

* * * * *

■ 13. Section 60.5416 is amended by:
■ a. Revising the section heading;
■ b. Revising the introductory text;
■ c. Revising paragraph (a) introductory text; and
■ d. Revising paragraph (b) introductory text.

The revisions read as follows:

§ 60.5416 What are the initial and continuous cover and closed vent system inspection and monitoring requirements for my storage vessel, centrifugal compressor and reciprocating compressor affected facilities?

For each closed vent system or cover at your storage vessel, centrifugal compressor and reciprocating compressor affected facility, you must comply with the applicable requirements of paragraphs (a) through (c) of this section.

(a) *Inspections for closed vent systems and covers installed on each centrifugal compressor or reciprocating compressor affected facility.* Except as provided in paragraphs (b)(11) and (12) of this section, you must inspect each closed vent system according to the procedures and schedule specified in paragraphs (a)(1) and (2) of this section, inspect each cover according to the procedures and schedule specified in paragraph (a)(3) of this section, and inspect each bypass device according to the procedures of paragraph (a)(4) of this section.

* * * * *

(b) *No detectable emissions test methods and procedures.* If you are required to conduct an inspection of a closed vent system or cover at your centrifugal compressor or reciprocating compressor affected facility as specified in paragraphs (a)(1), (2), or (3) of this section, you must meet the requirements of paragraphs (b)(1) through (13) of this section.

* * * * *

■ 14. Section 60.5420 is amended by:
■ a. Revising paragraph (b)(1)(iv);
■ b. Revising paragraph (b)(6)(ii);
■ c. Revising paragraphs (b)(6)(vi) and (vii);
■ d. Revising paragraphs (c)(1)(iii)(A) and (B);
■ e. Revising paragraph (c)(3)(ii); and
■ f. Revising paragraphs (c)(7), (8) and (9).

The revisions read as follows:

§ 60.5420 What are my notification, reporting, and recordkeeping requirements?

* * * * *

(b) * * *

(1) * * *

(iv) A certification by a certifying official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

* * * * *

(6) * * *

(ii) Documentation of the VOC emission rate determination according to § 60.5365(e) for each storage vessel that became an affected facility during the reporting period or is returned to service during the reporting period.

* * * * *

(vi) You must identify each storage vessel affected facility that is removed from service during the reporting period as specified in § 60.5395(f)(1)(ii), including the date the storage vessel affected facility was removed from service.

(vii) You must identify each storage vessel affected facility returned to service during the reporting period as specified in § 60.5395(f)(3), including the date the storage vessel affected facility was returned to service.

* * * * *

(c) * * *

(1) * * *

(iii) * * *

(A) For each gas well affected facility required to comply with the requirements of § 60.5375(a), you must record: The location of the well; the API well number; the date and time of the onset of flowback following hydraulic fracturing or refracturing; the date and time of each attempt to direct flowback to a separator as required in § 60.5375(a)(1)(i); the date and time of each occurrence of returning to the initial flowback stage under § 60.5375(a)(1)(i); and the date and time that the well was shut in and the flowback equipment was permanently disconnected, or the startup of production; the duration of flowback; duration of recovery to the flow line; duration of combustion; duration of venting; and specific reasons for venting in lieu of capture or combustion. The duration must be specified in hours of time.

(B) For each gas well affected facility required to comply with the requirements of § 60.5375(f), you must maintain the records specified in paragraph (c)(1)(iii)(A) of this section except that you do not have to record the duration of recovery to the flow line.

* * * * *

(3) * * *

(ii) Records of the date and time of each reciprocating compressor rod packing replacement, or date of installation of a rod packing emissions collection system and closed vent system as specified in § 60.5385(a)(3).

* * * * *

(7) A record of each cover inspection required under § 60.5416(a)(3) for centrifugal or reciprocating compressors or § 60.5416(c)(2) for storage vessels.

(8) If you are subject to the bypass requirements of § 60.5416(a)(4) for centrifugal or reciprocating compressors or § 60.5416(c)(3) for storage vessels, a record of each inspection or a record each time the key is checked out or a record of each time the alarm is sounded.

(9) If you are subject to the closed vent system no detectable emissions requirements of § 60.5416(b) for centrifugal or reciprocating compressors, a record of the monitoring conducted in accordance with § 60.5416(b).

* * * * *

■ 15. Section 60.5430 is amended by:

■ a. Adding, in alphabetical order, definitions for the terms "Certifying official," "Collection system," "Initial flowback stage," "Maximum average daily throughput," "Recovered gas," "Recovered liquids," "Removed from service," "Returned to service," "Separation flowback stage," "Startup of production," and "Well completion vessel;"

■ b. Removing the definition of "Affirmative defense;" and

■ c. Revising the definitions for "Equipment", "Flowback," "Routed to a process or route to a process," "Salable quality gas," and "Storage vessel."

The revisions read as follows:

§ 60.5430 What definitions apply to this subpart?

* * * * *

Certifying official means one of the following:

(1) For a corporation: A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(i) The facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars); or

(ii) The Administrator is notified of such delegation of authority prior to the exercise of that authority. The Administrator reserves the right to evaluate such delegation;

(2) For a partnership (including but not limited to general partnerships, limited partnerships, and limited liability partnerships) or sole proprietorship: A general partner or the proprietor, respectively. If a general partner is a corporation, the provisions of paragraph (1) of this definition apply;

(3) For a municipality, State, Federal, or other public agency: Either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (*e.g.,* a Regional Administrator of EPA); or

(4) For affected facilities:

(i) The designated representative in so far as actions, standards, requirements, or prohibitions under title IV of the Clean Air Act or the regulations promulgated thereunder are concerned; or

(ii) The designated representative for any other purposes under part 60.

* * * * *

Collection system means any infrastructure that conveys gas or liquids from the well site to another location for treatment, storage, processing, recycling, disposal or other handling.

* * * * *

Equipment, as used in the standards and requirements in this subpart relative to the equipment leaks of VOC from onshore natural gas processing plants, means each pump, pressure relief device, open-ended valve or line, valve, and flange or other connector that is in VOC service or in wet gas service, and any device or system required by those same standards and requirements in this subpart.

* * * * *

Flowback means the process of allowing fluids and entrained solids to flow from a natural gas well following a treatment, either in preparation for a subsequent phase of treatment or in preparation for cleanup and returning the well to production. The term *flowback* also means the fluids and entrained solids that emerge from a natural gas well during the flowback process. The *flowback period* begins when material introduced into the well during the treatment returns to the surface following hydraulic fracturing or refracturing. The *flowback period* ends when either the well is shut in and

permanently disconnected from the flowback equipment or at the startup of production. The flowback period includes the initial flowback stage and the separation flowback stage.

* * * * *

Initial flowback stage means the period during a well completion operation which begins at the onset of flowback and ends at the separation flowback stage.

* * * * *

Maximum average daily throughput means the earliest calculation of daily average throughput during the 30-day PTE evaluation period employing generally accepted methods.

* * * * *

Recovered gas means gas recovered through the separation process during flowback.

Recovered liquids means any crude oil, condensate or produced water recovered through the separation process during flowback.

* * * * *

Removed from service means that a storage vessel affected facility has been physically isolated and disconnected from the process for a purpose other than maintenance in accordance with § 60.5395(f)(1).

Returned to service means that a Group 1 or Group 2 storage vessel affected facility that was *removed from service* has been:

(1) Reconnected to the original source of liquids, connected in parallel to any storage vessel affected facility or has been used to replace any storage vessel affected facility; or

(2) Installed in any location covered by this subpart and introduced with crude oil, condensate, intermediate hydrocarbon liquids or produced water.

Routed to a process or route to a process means the emissions are conveyed via a closed vent system to any enclosed portion of a process where the emissions are predominantly recycled and/or consumed in the same manner as a material that fulfills the same function in the process and/or transformed by chemical reaction into materials that are not regulated materials and/or incorporated into a product; and/or recovered.

Salable quality gas means natural gas that meets the flow line or collection system operator specifications, regardless of whether such gas is sold.

Separation flowback stage means the period during a well completion operation when it is technically feasible for a separator to function. The *separation flowback stage* ends either at the startup of production, or when the well is shut in and permanently disconnected from the flowback equipment.

Startup of production means the beginning of initial flow following the end of flowback when there is continuous recovery of salable quality gas and separation and recovery of any crude oil, condensate or produced water.

Storage vessel means a tank or other vessel that contains an accumulation of crude oil, condensate, intermediate hydrocarbon liquids, or produced water, and that is constructed primarily of nonearthen materials (such as wood, concrete, steel, fiberglass, or plastic) which provide structural support. Two or more storage vessels connected in parallel are considered equivalent to a single storage vessel with throughput equal to the total throughput of the storage vessels connected in parallel. A well completion vessel that receives recovered liquids from a well after startup of production following flowback for a period which exceeds 60 days is considered a storage vessel under this subpart. A tank or other vessel shall not be considered a storage vessel if it has been removed from service in accordance with the requirements of § 60.5395(f) until such time as such tank or other vessel has been returned to service. For the purposes of this subpart, the following are not considered storage vessels:

(1) Vessels that are skid-mounted or permanently attached to something that is mobile (such as trucks, railcars, barges or ships), and are intended to be located at a site for less than 180 consecutive days. If you do not keep or are not able to produce records, as required by § 60.5420(c)(5)(iv), showing that the vessel has been located at a site for less than 180 consecutive days, the vessel described herein is considered to be a storage vessel from the date the original vessel was first located at the site. This exclusion does not apply to a well completion vessel as described above.

(2) Process vessels such as surge control vessels, bottoms receivers or knockout vessels.

(3) Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere.

* * * * *

Well completion vessel means a vessel that contains *flowback* during a well completion operation following hydraulic fracturing or refracturing. A well completion vessel may be a lined earthen pit, a tank or other vessel that is skid-mounted or portable. A well completion vessel that receives recovered liquids from a well after startup of production following flowback for a period which exceeds 60 days is considered a storage vessel under this subpart.

* * * * *

[FR Doc. 2014–30630 Filed 12–30–14; 8:45 am]

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Part II

Environmental Protection Agency

40 CFR Part 60

Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[EPA–HQ–OAR–2009–0734; FRL–9920–50–OAR]

RIN 2060–AP93

Standards of Performance for New Residential Wood Heaters, New Residential Hydronic Heaters and Forced-Air Furnaces

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is taking final action to revise the Standards of Performance for New Residential Wood Heaters and to add a new subpart: Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces. Today's rule is authorized by section 111(b) and section 114 of the Clean Air Act (CAA). The EPA is not finalizing, at this time, the proposed Standards of Performance for New Residential Masonry Heaters in order to allow additional time for the Masonry Heater Association to finish their efforts to develop revised test methods, an emissions calculation program and an alternative dimensioning standard. This final rule achieves several objectives for new residential wood heaters, including applying updated emission limits that reflect the current best systems of emission reduction; eliminating exemptions over a broad suite of residential wood combustion devices; strengthening test methods as appropriate; and streamlining the certification process. Residential wood smoke emissions are a significant national air pollution problem and human health issue. These emissions occur in many neighborhoods across the country, including minority and low-income neighborhoods, and impact people in their homes. To the extent that children and other sensitive populations are particularly susceptible to asthma, and that minority populations and low-income populations are more vulnerable, this rule will significantly reduce the pollutants that adversely affect their health. On an economic basis, the public benefits of this rule vastly outweigh the costs, with every dollar in additional cost producing more than $100 in public benefit. This final action does not include any requirements for heaters solely fired by gas, oil or coal. In addition, it does not include any new requirements associated with appliances that are already in use. The EPA continues to strongly encourage state, local, tribal, industry and consumer efforts to change out (replace) older heaters with newer, cleaner, more efficient heaters. Additional information is on the EPA Burn Wise Web site at *www.epa.gov/burnwise.* Also, we encourage state, local, and tribal authorities to develop site-specific installation and operating requirements to help ensure healthy air for all.

DATES: This final action is effective on May 15, 2015. The incorporation by reference of certain publications listed in this rule is approved by the Director of the Federal Register as of May 15, 2015.

ADDRESSES: The EPA has established a docket for this action under Docket ID Number EPA–HQ–OAR–2009–0734. All documents in the docket are listed in the *http://www.regulations.gov* index. Although listed in the index, some information is not publicly available (*e.g.,* confidential business information or other information whose disclosure is restricted by statute). Certain other material, such as copyrighted material, will be publicly available only in hard copy form. Publicly available docket materials are available either electronically at *http://www.regulations.gov* or in hard copy at the EPA Docket Center, Public Reading Room, EPA WJC West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: For questions about this final rule for new residential wood heaters, hydronic heaters, and forced-air furnaces, contact Ms. Amanda Aldridge, Office of Air Quality Planning and Standards, Outreach and Information Division (C304–05), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541–5268; fax number (919) 541–2664; email address: *aldridge.amanda@epa.gov.*

SUPPLEMENTARY INFORMATION:

Acronyms and Abbreviations. The following acronyms and abbreviations are used in this document:

μg/m3 Micrograms per cubic meter
ASTM American Society for Testing and Materials (now ASTM International)
BSER Best System of Emissions Reduction
BTU British Thermal Unit
CAA Clean Air Act
CBI Confidential Business Information
CDX Central Data Exchange
CEDRI Compliance and Emissions Data Reporting Interface
CFR Code of Federal Regulations
CO Carbon Monoxide
CO_2 Carbon Dioxide
CSA Canadian Standards Association
EPA U.S. Environmental Protection Agency
ERT Electronic Reporting Tool
EJ Environmental Justice
FR Federal Register
g/hr Grams per hour
HAP Hazardous Air Pollutant(s)
HPBA Hearth, Patio and Barbecue Association
IBR Incorporation by Reference
ICR Information Collection Request
ISO International Organization for Standardization
lb Pound(s)
lb/hr Pound(s) per hour
lb/mmBtu Pound(s) per million British Thermal Units
NAAQS National Ambient Air Quality Standards
NAICS North American Industry Classification System
NESCAUM Northeast States for Coordinated Air Use Management
NESHAP National Emission Standards for Hazardous Air Pollutants
NO_X Nitrogen Oxides
NSPS New Source Performance Standards
NTTAA National Technology Transfer and Advancement Act of 1995
NYSERDA New York State Energy Research and Development Authority
OAQPS Office of Air Quality Planning and Standards (U.S. EPA)
OECA Office of Enforcement and Compliance Assurance (U.S. EPA)
OMB Office of Management and Budget
PAH Polycyclic Aromatic Hydrocarbon
PFI Pellet Fuels Institute
POM Polycyclic Organic Matter
PM Particulate Matter
$PM_{2.5}$ Particulate Matter with an aerodynamic diameter of 2.5 micrometers or less (''fine particles'')
ppm Parts per million
R&D Research and Development
RIA Regulatory Impact Analysis
RTC Response to Comments
U.S. United States
U.S.C. United States Code
UMRA Unfunded Mandates Reform Act
vs. Versus
VCS Voluntary Consensus Standard(s)
VOC Volatile Organic Compound
yr Year(s)

Response to Comments (RTC) Document. On February 3, 2014 (79 FR 6330), the EPA proposed revisions to the Standards of Performance for New Residential Wood Heaters based on the EPA's review of these standards. On July 1, 2014 (79 FR 37259), the EPA published a Notice of Data Availability (NODA) that solicited comment on additional information regarding residential wood heater testing using cord wood and emissions by burn rate excerpted from EPA certification test reports. In this action, we are finalizing

revisions to the rule, as well as Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces. A document summarizing the public comments on the proposal and the NODA and the EPA responses to the significant comments is available in Docket ID Number EPA–HQ–OAR–2009–0734. A summary of responses to the major comments is in section V.

Organization of this Document. The following outline is provided to aid in locating information in this preamble.

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J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations
K. Congressional Review Act

I. General Information

A. Executive Summary

The purpose of this action is to finalize amendments to the Standards of Performance for New Residential Wood Heaters (40 CFR part 60, subpart AAA) and to add one new subpart: Standards of Performance for New Residential Hydronic Heatersand Forced-Air Furnaces (40 CFR part 60, subpart QQQQ). This final action was developed following a CAA section 111(b)(1)(B) review of the 1988 promulgated subpart AAA (53 FR 5860, February 26, 1988), *i.e.,* the 1988 New Source Performance Standards (NSPS). Section 111 requires the EPA to establish standards based on best systems of emission reduction (BSER). Section 111(b) requires emission standards for affected sources and section 111(h)(2)(B) allows the EPA to establish work practices and operational standards or combinations of standards in certain cases, such as when testing is impractical due to technological or economic limitations. The current body of evidence strongly supports revision of the 1988 NSPS to capture the technology improvements and enhanced performance of such units since 1988 and to expand the applicability of these standards to include additional wood-burning residential heating devices that are available today. Section 111 requires the EPA to consider costs and economic impacts. The potential impact on this industry that is comprised of over 90 percent small businesses was a concern to the EPA, and we have minimized these potential impacts to the degree possible while still achieving significant emission reductions. For example, we have incorporated stepped (phased) emission limits and streamlined certification procedures to ease the transition. The health benefits associated with these regulations are substantially greater than the cost to manufacture cleaner, lower-emitting appliances. In fact, the public health benefits of this rule outweigh the costs by more than 100 times.

As discussed in the preamble to the February 3, 2014, proposed rule, particulate pollution from wood heaters is a significant national air pollution problem and human health issue. Residential wood smoke contains fine particles with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), carbon monoxide (CO), volatile organic compounds (VOC), toxic air pollutants (*e.g.,* benzene and formaldehyde), and climate-forcing emissions (*e.g.,* methane and black carbon). Residential wood smoke can contribute to unhealthy levels of $PM_{2.5}$ in many neighborhoods nationwide, including in minority and low-income neighborhoods, and impact people in their homes. To the extent that children and other sensitive populations are particularly susceptible to asthma, and that minority populations and low-income populations are more vulnerable to the effects of air pollution, this rule will significantly reduce the pollutants that adversely affect their health.

Populations that are at greater risk for experiencing health effects related to fine particle exposures include older adults, children and individuals with pre-existing heart or lung disease. Each year, smoke from wood heaters produces hundreds of thousands of tons of fine particles throughout the country—mostly during the winter months. Nationally, residential wood combustion accounts for 44 percent of total stationary and mobile polycyclic organic matter (POM) emissions, which account for nearly 25 percent of all area source air toxics cancer risks and 15 percent of noncancer respiratory effects.[1] Residential wood smoke causes many counties in the U.S. to either exceed the EPA's health-based national ambient air quality standards (NAAQS) for fine particles or places them on the cusp of exceeding those standards.[2] To the degree that older, higher emitting, less efficient wood heaters are replaced by newer heaters that meet the requirements of this rule, these requirements for cleaner new stoves will result in substantial reductions in emissions, and thus in exposure, producing reduced health impacts. A summary of the estimated health

[1] *Strategies for Reducing Residential Wood Smoke.* EPA–456/B–13–001, March 2013. Prepared by Outreach and Information Division, Air Quality Planning Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711. pp. 4–5.

[2] Air Quality and Emissions Data; Supporting Information for the Residential Wood Heater New Source Performance Standard, August 14, 2013.

benefits is shown in Table 1 below. More details are in the final Regulatory Impact Analysis (RIA) in the docket for this rule.

Consistent with Executive Order 13563, "Improving Regulation and Regulatory Review," we have estimated the cost and benefits of the final rule. The estimated annual net benefits at a 3-percent discount rate are $3.4 billion to $7.6 billion, and $3.1 billion to $6.9 billion at a 7-percent discount rate in 2013 dollars. The net benefits estimate reflects 8,269 tons of $PM_{2.5}$ emission reductions per year, and a total annualized cost of $45.7 million, producing an unusually large net benefit for this rule of more than 100 times the costs, and even greater net benefits coming from the new rule applied to single burn rate stoves. We estimate that this rule will result in 360 (Krewski, *et. al.,* 2009) or 810 (Lepeule, *et. al.,* 2012) avoided premature deaths per year. The non-monetized benefits include 46,000 tons of CO reductions per year; 9,300 tons of VOC reductions per year; reduced exposure to hazardous air pollutants (HAP), including formaldehyde, benzene, and polycyclic organic matter (POM); reduced climate effects due to reduced black carbon emissions and reduced greenhouse gases emissions; reduced ecosystem effects; and reduced visibility impairments. Table 1 is a summary of the results of the analysis per type of residential wood heater. We have provided estimates reflecting average annual impacts for the 2015 to 2020 timeframe, which are the implementation years analyzed in the RIA for this final rule.

TABLE 1—SUMMARY OF COMPLIANCE COSTS, MONETIZED BENEFITS, AND MONETIZED NET BENEFITS (2013 DOLLARS) BY TYPE OF HEATER IN THE 2015–2020 TIME FRAME FOR THE FINAL RULE

Type of heater	Total annualized costs ($ millions)	Monetized benefits ($ millions) [a b]	Monetized net benefits ($ millions)
Wood stoves	$3.02	$14 to $31	$11 to $28
Single burn rate stoves	0.87	280 to 630	280 to 630
Pellet stoves	1.52	2 to 5	0 to 3
Forced-air furnaces	15.36	1,700 to 3,700	1,700 to 3,700
Hydronic heating systems	24.88	1,400 to 3,200	1,400 to 3,200

[a] All estimates are for the time frame from 2015 to 2020 inclusive. These results include units anticipated to come online and the lowest cost disposal assumption. Total annualized costs shown in this table are estimated at a 7-percent interest rate to be consistent with guidance from the Office of Management and Budget (OMB). Total annualized costs are also estimated at a 3 percent interest rate for each source category to be consistent with OMB guidance, and these costs are about 13 percent less than the total annualized costs presented in this table. These costs are presented in the RIA and in the cost memoranda for this final rule. The monetized net benefits with total annualized costs at a 3 percent interest rate are minimally different than those calculated with total annualized costs at a 7 percent interest rate.

[b] Total monetized benefits are estimated at a 3-percent discount rate. The total monetized benefits reflect the human health benefits associated with reducing exposure to $PM_{2.5}$ through reductions of directly emitted $PM_{2.5}$. It is important to note that the monetized benefits include many but not all health effects associated with $PM_{2.5}$ exposure. Benefits are shown as a range from Krewski et al. (2009) to Lepeule et al. (2012). These models assume that all fine particles, regardless of their chemical composition, are equally potent in causing premature mortality because the scientific evidence is not yet sufficient to allow differentiation of effect estimates by particle type. Because these estimates were generated using benefit-per-ton estimates, we do not break down the total monetized benefits into specific components.

B. Does this action apply to me?

Table 2 of this preamble lists categories and entities that will be regulated by this action. Table 2 is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be affected by this final action. These standards, and any changes considered in this rulemaking, are directly applicable to sources as a federal program. Other federal, state, local and tribal government entities are not directly affected by this final action. States may decide to request partial delegation of enforcement of some parts of this rule, *e.g.,* ensuring permanent labels are on new heaters in retail stores.

TABLE 2—REGULATED ENTITIES

Category	NAICS [a] code	Examples of regulated entities
Residential Wood Heating	333414—Heating Equipment (except Warm Air Furnaces) Manufacturing. 333415—Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing.	Manufacturers, owners and operators of wood heaters, pellet heaters/stoves and hydronic heaters. Manufacturers, owners and operators of forced-air furnaces.
Testing Laboratories	541380—Testing Laboratories (except Medical, Veterinary).	Testers of wood heaters, pellet heaters/stoves and hydronic heaters.

[a] North American Industry Classification System

C. Where can I get a copy of this document?

In addition to being available in the docket, an electronic copy of this final rule, is posted at the following address: *http://www2.epa.gov/residential-wood-heaters.*

D. Judicial Review

Under section 307(b)(1) of the Clean Air Act (CAA), judicial review of these final rules is available only by filing a petition for review in the United States Court of Appeals for the District of Columbia Circuit by May 15, 2015. Under section 307(b)(2) of the CAA, the requirements established by these final rules may not be challenged separately in any civil or criminal proceedings brought by the EPA to enforce these requirements. Section 307(d)(7)(B) of the CAA further provides that "[o]nly an objection to a rule or procedure which was raised with reasonable specificity

during the period for public comment (including any public hearing) may be raised during judicial review." This section also provides a mechanism for us to convene a proceeding for reconsideration, "[i]f the person raising an objection can demonstrate to the EPA that it was impracticable to raise such objection within [the period for public comment] or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule." Any person seeking to make such a demonstration to us should submit a Petition for Reconsideration to the Office of the Administrator, U.S. EPA, Room 3000, 1200 Pennsylvania Ave. NW., Washington, DC 20460, with a copy to both the person(s) listed in the preceding **FOR FURTHER INFORMATION CONTACT** section, and the Associate General Counsel for the Air and Radiation Law Office, Office of General Counsel (Mail Code 2344A), U.S. EPA, 1200 Pennsylvania Ave. NW., Washington, DC 20460.

II. Background Information for This Final Rule

A. What is the NSPS program?

Under section 111 of the CAA, "Standards of Performance for New Stationary Sources," the EPA lists categories of sources that, in the EPA's judgment, cause or contribute significantly to air pollution, which may reasonably be anticipated to endanger public health or welfare pursuant to section 111(b)(1)(A). Section 111(b)(1)(B) requires the EPA to promulgate federal standards of performance for new sources within those categories. At the time the EPA establishes standards for a source category, the EPA prepares an analysis of the potential costs and benefits associated with the NSPS, which also includes the benefits from reductions in pollutants for which the standards do not set limits. For example, emission reductions associated with the requirements of this final rule will generate health benefits by reducing emissions of $PM_{2.5}$, other criteria pollutants, such as CO, and non-criteria HAP. In addition, section 111(h) authorizes the EPA to promulgate design, equipment, work practice, operational, or combinations of standards to reflect the best systems of continuous emission reduction. The NSPS established under section 111(b)(1)(B) do not establish standards of performance for existing sources. However, numerous states have acted independently of this rule to address new and existing sources as part of state implementation plan (SIP) measures necessary to ensure attainment and maintenance of the NAAQS.

The level of control prescribed by section 111 of the CAA is BSER. In analyzing BSER, the EPA uses available information and considers the emissions reductions and incremental costs for different systems available at reasonable cost. The residential wood heaters source category is different from most NSPS source categories in that it is for mass-produced residential consumer products. Thus, important elements in determining BSER include the significant costs and environmental impacts of delaying production while models with those systems are designed, tested, field evaluated and certified. Section 111(b)(1)(B) of the CAA requires that the standards be effective upon the effective date of the NSPS. As noted earlier and discussed more fully later in this preamble, the stepped (phased) approach for residential wood stoves/heaters, hydronic heaters and forced-air furnaces that the EPA is promulgating considers these factors. That is, for this rulemaking, the EPA has determined the appropriate emission limits and compliance deadlines that together are representative of BSER.

Section 111(b)(1)(B) of the CAA requires the EPA to periodically (every 8 years) review an NSPS unless it determines "that such review is not appropriate in light of readily available information on the efficacy of such standard." In making revisions to an NSPS, the EPA will revise the standards of performance to reflect improvements in methods for reducing emissions, including consideration of what emissions limitation is achieved in practice. Numerous stakeholders have stated that the current body of evidence strongly justifies the revision of the current residential wood heaters NSPS to capture the improvements in performance of such units since 1988 and to expand the applicability of this NSPS to include additional residential wood-burning heating devices that are available today. Some stakeholders have suggested that the EPA also develop additional NSPS to regulate residential heating devices that burn fuels other than or in addition to wood, *e.g.*, coal, corn or grass. This final rule does not include any new federal requirements for heaters that solely burn fuels other than wood. However, the EPA may consider the need for such requirements during the next review.

B. Why is residential wood smoke a concern?

There is widespread recognition of the health impacts of particle pollution, to which wood smoke is a contributing factor in many areas. Wood smoke contains a mixture of fine particles and toxic air pollutants (*e.g.*, benzene and formaldehyde) that can cause burning eyes, runny nose, and bronchitis. Exposure to fine particles has been associated with a range of health effects, including aggravation of heart or respiratory problems, changes in lung function and increased respiratory symptoms, as well as premature death. Populations that are at greater risk for experiencing health effects related to fine particle exposures include older adults, children and individuals with pre-existing heart or lung disease. Each year smoke from wood heaters contributes hundreds of thousands of tons of fine particles throughout the country—mostly during the winter months. Nationally, residential wood combustion accounts for 44 percent of total stationary and mobile polycyclic organic matter (POM) emissions, which accounts for nearly 25 percent of all area source air toxics cancer risks and 15 percent of noncancer respiratory effects.[3] Residential wood smoke causes many counties in the U.S. to either exceed the EPA's health-based NAAQS for fine particles or places them on the cusp of exceeding those standards. For example, in places such as Keene, New Hampshire; Sacramento, California; Tacoma, Washington; and Fairbanks, Alaska; wood combustion can contribute over 50 percent of daily wintertime fine particle emissions.[4] The concerns are heightened because wood stoves, hydronic heaters, and other heaters are often used around the clock in many residential areas. To the degree that older, dirtier, less efficient wood heaters are replaced by newer heaters that meet or exceed the requirements of this rule, the emissions would be reduced, and thus exposure as well, and fewer health impacts should occur. The health and air quality concerns associated with particle pollution and the effects of wood smoke are discussed in detail in the original listing of residential wood heaters under section 111(b) in the February 18, 1987, **Federal**

[3] *Strategies for Reducing Residential Wood Smoke.* EPA–456/B–13–001, March 2013. Prepared by Outreach and Information Division, Air Quality Planning Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711. pp. 4–5.

[4] Air Quality and Emissions Data; Supporting Information for the Residential Wood Heater New Source Performance Standard, August 14, 2013.

Register, the original subpart AAA proposal in the February 18, 1987, **Federal Register**, the original subpart AAA promulgation in the February 26, 1988, **Federal Register**, the February 3, 2014 proposal of revisions to subpart AAA and the addition of subpart QQQQ and numerous other documents in the docket.

As discussed in the preamble to the February 3, 2014, proposed rule, and, in the Executive Summary (section I.A) of this preamble, particulate pollution from wood heaters is a significant national air pollution problem and human health issue. To the degree that older, higher emitting, less efficient wood heaters are replaced by newer heaters that meet the requirements of this rule, setting these requirements for cleaner new stoves will result in substantial reductions in exposure and reduced health impacts.

III. Summary of the Final Rule

A. General

In response to the results of the review of the 1988 NSPS and in response to comments on the proposed rule and the NODA, the EPA is amending 40 CFR part 60, subpart AAA, Standards of Performance for New Residential Wood Heaters, and adding a new subpart QQQQ, Standards of Performance for New Hydronic Heaters and Forced-Air Furnaces. Subpart AAA applies to room heaters. This final rule broadens the applicability of wood heaters subject to the 1988 NSPS beyond adjustable burn rate wood heaters (the focus of the 1988 regulation) to specifically include all single burn rate wood heaters/stoves/appliances and pellet heaters/stoves/appliances and all other residential wood heaters except those specifically exempt in the rule, *e.g.,* hydronic heaters and forced air furnaces regulated by subpart QQQQ. (Some pellet heaters/stoves/appliances were not affected by the 1988 regulation.) This preamble uses the following terms interchangeably for appliances subject to subpart AAA: wood heaters, stoves and heaters/stoves/appliances. Subpart QQQQ applies to two specific types of wood heaters: hydronic heaters and forced-air furnaces plus any other wood-burning affected appliance that meets the definition of central heater. This preamble uses the terms forced-air furnaces and warm-air furnaces interchangeably for such heaters/furnaces/appliances affected by subpart QQQQ. Wood heaters, hydronic heaters and forced-air furnaces manufactured after the effective date of this final rule will be required to meet PM emission limits.

This final rule does not include any federal emission limitations that would apply to heaters fueled solely by gas, oil or coal. In addition, this final rule does not include any new federal requirements associated with wood heaters or other wood-burning appliances that are already in use in people's homes. The EPA continues to encourage state, local, tribal, manufacturer, retailer and consumer efforts to change out (replace) older heaters with newer, cleaner, more efficient heaters. Also, we continue to encourage state, local, and tribal authorities to develop site-specific installation and operating requirements and oversight to help ensure healthy air for all.

For this final action, the effective date is May 15, 2015 to allow for Congressional Review under the Congressional Review Act (CRA). Under the CRA, 5 U.S.C. 801(a)(3), the effective dates of all ''major'' rules are delayed for 60 calendar days after they are submitted to Congress or after they are published in the **Federal Register**, whichever date is later. This final action is a ''major'' rule within the meaning of the CRA.

Section IV summarizes the changes to the proposed rule reflected in the final rule, and section V provides a summary of the major comments received and our responses.

1. Certification Testing and Compliance

As with the 1988 NSPS, because of concern regarding potential negative impacts on small businesses and potential certification delays, this revised subpart AAA for wood heaters/stoves and new subpart QQQQ for hydronic heaters and forced-air furnaces require manufacturers to participate in a certification program that tests a representative heater per model line rather than testing every heater. If the representative heater meets the applicable emission limits contained in this rule, the entire model line may be certified. Individual heaters within the model line are still subject to all other requirements, including labeling and operational requirements. Manufacturers are required to have quality assurance programs to ensure that all heaters within the model line conform to the certified design and meet the applicable emission limits. The EPA will continue to have the authority to conduct audits to ensure compliance.

Additional requirements apply to entities other than the manufacturer. Wholesalers and retailers are also subject to the limits on sales of non-certified affected heaters. Wood heater test laboratories and certifying entities are subject to quality assurance and reporting requirements. This final rule for subpart AAA and subpart QQQQ requires the proper burn practices that have applied to the owner or operator of a wood heating appliance regulated under subpart AAA since 1988. In addition, new pellet heater/stove owners and operators will be required to use only the grades of pellet fuels and wood chips that are included in the owner's manual based on the heater/stove certification tests. In this final rule, we are revising the original 1988 enforcement and audit provisions to reflect changes in industry practices and development of new tools and procedures. We are also taking final action to improve the previous test methods as well as adding new test methods. More details are in sections IV.D and V.

2. Stepped Compliance Approach

The 1988 NSPS addressed some of the specific characteristics of this source category by developing a stepped compliance approach that provided manufacturers a two-phased implementation of emission limits. Considering that over 90 percent of the manufacturers and retailers are small businesses, we have included this approach in the revised subpart AAA and new subpart QQQQ in order to allow manufacturers lead time to develop, test, field evaluate and certify current technologies across their consumer product lines to meet Step 2 emission limits and in most cases to allow retailers to sell-through inventory. Upon the effective date of this final rule, all new residential wood heaters subject to subparts AAA and QQQQ will be required to meet the NSPS standards. The standards are phased from immediate requirements on the effective date to Step 2 emission limits five years later. The specific emission limits and dates for subparts AAA and QQQQ are shown in Table 3 and Table 4, respectively. To further ease the transition on small businesses, the EPA will not require new testing of heaters that have current certificates of compliance under the 1988 NSPS that show they meet the Step 1 emission levels. Those certificates are automatically extended beyond their current expiration date until the compliance deadline for the Step 2 emission limits. Also, this final rule automatically deems certified hydronic heaters that have been qualified at the Step 1 emission level (or better) under the EPA voluntary partnership program for hydronic heaters or forced-air furnaces that have been independently certified at the Step 1 emission level (or

better) or under Canadian Standards Association B415.1–10.

3. NSPS Labels

The final rule requires that each room heater under subpart AAA and central heater under subpart QQQQ be equipped with a permanent label meeting the applicable requirements in § 60.536 and § 60.5478, respectively. The permanent label must include identifying information for the unit and its compliance certification status. The permanent label must be installed so that it is readily visible both before and after the unit is installed. This requirement is needed to assist state, local and tribal officials in determining if a unit complies with state, local and tribal rules and in determining eligibility for any future change out (replacement) programs. Note that ''readily visible'' does not mean under the body of freestanding stove but it does allow an easily removable decorative façade to cover the label.

In the 1988 NSPS, temporary labels (*e.g.,* hangtags) were required for wood heaters that are subject to the standards, as well as ones that are not (*e.g.,* coal heaters/stoves). These temporary labels were intended to assist consumers in comparing different appliance models and to inform the consumer about the importance of proper operation and maintenance. We proposed to remove the requirement for temporary labels, and we requested comment. After reviewing the comments received, the EPA now concludes that these temporary labels are most valuable if they assist purchasers in identifying the cleanest and most efficient heaters. Therefore, in this final rule the EPA is allowing (voluntary) a temporary NSPS label (hangtag) for each adjustable burn rate heater, single-burn rate heater, pellet heater/stove, hydronic heater and forced-air furnace sold at retail that meets the Step 2 emission limits before the Step 2 compliance date. This temporary label option will end upon the Step 2 compliance date.

In addition, we are providing an alternative compliance option for manufacturers who choose to demonstrate compliance with Step 2 emission limits using cord wood testing rather than the standardized crib wood testing, currently used for the primary compliance option for appliances regulated under subpart AAA and for hydronic heaters under subpart QQQQ. As discussed in the preamble to the February 3, 2014, proposed rule, crib wood is a specified configuration and quality of dimensional lumber and spacers that improves the repeatability of the test method. Cord wood is a different specified configuration and quality of wood that more closely resembles what a typical homeowner would use. Cord wood testing is a better measure of how the heaters will perform on the type of fuel commonly used in homes.

Each of these models would be equipped with both a permanent label and the voluntary option of a special temporary label (hangtag) informing consumers that these wood heaters were tested and certified when burning cord wood. The specific emission limits are discussed in sections III.B and III.C.

4. New Residential Masonry Heaters (Proposed Subpart RRRR)

The EPA is not taking final action at this time on proposed subpart RRRR for new residential masonry heaters. Our reason for taking no action at this time is to allow additional time for the Masonry Heater Association (MHA) to finish their efforts to develop revised test methods, an emissions calculation program and an alternative dimensioning standard. The MHA believes these efforts are critical because most masonry heaters are custom built on-site and testing each custom model would be difficult. The nationwide emission impacts of delaying regulating subpart RRRR are small relative to the impacts of regulating subparts AAA and QQQQ. Fewer than approximately 1,000 masonry heaters are manufactured each year and a total of less than 10 tons per year of $PM_{2.5}$ are currently emitted. In comparison, new wood burning appliances covered by subparts AAA and QQQQ are estimated to number more than 200,000 (2015) and currently emit more than 11,000 tons per year of $PM_{2.5}$.[5]

B. Room Heaters (Revised Subpart AAA)

1. Applicability

After the effective date, new heaters will be required to meet the updated standards. The new standards apply not only to adjustable burn rate wood heaters (the focus of the original regulation), but also to single burn rate wood heaters/stoves, pellet heaters/stoves, and any other affected appliance as defined in revised subpart AAA as a ''room heater.'' Subpart AAA, as amended, does not apply to new residential hydronic heaters or new residential forced-air furnaces because they are subject to their own subpart. The revised subpart AAA does not apply to fireplaces as defined in Subpart AAA. This final rule tightens the definition for ''cook stoves'' and adds definitions for ''camp stoves'' and ''traditional Native American bake ovens'' to clarify that they are not subject to the standard other than appropriate labeling for cook stoves and camp stoves and no requirements for traditional Native American bake ovens. Finally, the revised subpart AAA clarifies that the emission limits apply only to wood-burning devices (*i.e.,* not to devices that only burn fuels other than wood, *e.g.,* gas, oil or coal).

2. Automatic EPA Certification for Currently Certified Heaters/Stoves That Meet the Step 1 Emission Levels

In this final rule we make clear that those heaters/stoves with EPA certifications under the 1988 NSPS that show compliance with the Step 1 emission levels will be automatically deemed as certified to meet the Step 1 emission limits under this final rule until the Step 2 compliance date. No separate certification will be required. Over 85 percent of heaters/stoves being sold today already meet the Step 1 emission limit. This automatic certification will avoid unnecessary economic impacts on those manufacturers (over 90 percent are small businesses) who can then focus their efforts on developing a full range of cleaner models that meet Step 2 emission levels. This measure should also help avoid potential delays at laboratories conducting certification testing for heaters newly subject to the NSPS.

3. Two-Step Compliance Approach

We are promulgating a two-step compliance approach that will apply to all new adjustable burn rate wood heaters, single burn rate wood heaters and pellet heaters/stoves. Under this approach, Step 1 emission limits for these sources will apply to each source manufactured on or after the effective date of the final rule or sold at retail on or after December 31, 2015. The approximately 8-month additional time for the retail sale requirement will allow retailers to sell their inventories of heaters that do not comply with the Step 1 emission limits. Step 2 emission limits for these sources will apply to each heater manufactured or sold at retail on or after the date 5 years after the effective date of the final rule. We are not including the alternative three-step emission limit compliance approach for which we also requested comment in the proposal. The comments overwhelmingly indicated that the three-step emission limit approach was inferior not only environmentally but also economically because it would, in effect, require

[5] Memo to USEPA from EC/R, Inc. Estimated Emissions from Wood Heaters. January 2015.

many small manufacturers to engage in two rounds of research and development (R&D) rather than one in order to obtain the same eventual endpoint.

Table 3 summarizes the PM emissions limits that apply to each wood heater under this two-step approach. Note that the emissions standards are ''as measured'' by the test methods specified in the rule and are labeled as PM although the PM is essentially all $PM_{2.5}$. This avoids the potential extra testing costs of measuring $PM_{2.5}$ specifically.

TABLE 3—SUBPART AAA PM EMISSIONS LIMITS

Phases/steps	PM emissions limit
Step 1: Upon the effective date of final rule.	4.5 g/hr.
Step 2: 5 years after the effective date of the final rule.	2.0 g/hr.
Step 2: Cord wood alternative compliance option.	2.5 g/hr.

We are allowing an alternative compliance option for manufacturers who choose to certify using cord wood (rather than crib wood) to meet the Step 2 limits. (As discussed earlier in this preamble, crib wood is a specified configuration and quality of dimensional lumber and spacers that improves the repeatability of the test method. Cord wood is a different specified configuration and quality of wood that more closely resembles what a typical homeowner would use.) Special permanent and temporary labels for room heaters certified with cord wood would specify that they meet a PM emissions limit of 2.5 g/hr. The bases for the crib wood primary emission limit of 2.0 g/hr and the cord wood alternative compliance option emission level of 2.5 g/hr for wood stoves, as well as the limited environmental impact of the differences in these levels, are discussed in section V.A BSER and Particulate Emission Limits for Room Heaters (revised subpart AAA).

The proposal would have required cord wood testing for all Step 2 compliance certifications. Cord wood testing is a better measure of how stoves actually perform in home use; however, we are concerned that many manufacturers (over 90 percent are small businesses) do not yet have experience with designing their stoves to perform well with cord wood testing. Some manufacturers may not be ready for cord wood testing by the Step 2 compliance date and that would result in unreasonable economic impacts. Allowing the cord wood alternative compliance option acknowledges the efforts of the industry leaders and encourages others to follow their example.

The revised subpart AAA does not include a compliance extension for small volume manufacturers. An extension for manufacture of adjustable burn rate heaters is not necessary because over 85 percent of these appliances already comply with Step 1 emission levels.

We are making a single determination of BSER for catalytic, noncatalytic and hybrid heater systems so as not to restrict open market competition. As in the 1988 NSPS, we are requiring manufacturers to provide warranties on the catalysts, prohibit the operation of catalytic heaters/stoves without a catalyst and require operation according to the owner's manual. In addition, we are requiring manufacturers to provide warranties for noncatalytic and hybrid heaters/stoves and require operation according to the owner's manual.

As discussed at proposal, we considered requiring efficiency standards (heat output divided by fuel input) to ensure that stoves are efficient and burn no more wood than necessary for the heat demand so that the consumers can save money on fuel and so that the emissions are lower. We did not propose an efficiency standard because we did not have sufficient data, but the final rule uses our authority under section 114 to require the manufacturer to submit third-party efficiency test data, submit the test data report to the EPA and post the results on the manufacturer's Web site. Also, we will include this submitted information on the EPA Web site. This will help consumers to make informed choices to reduce fuel costs and emissions now and provide data for us to consider for future rulemaking.

4. Emission Testing, Reporting and Certification

We are requiring emission testing, reporting and certification based on crib wood to demonstrate compliance with Step 1 and Step 2 emissions limits. As discussed in the preamble to the February 3, 2014, proposed rule, ''crib wood'' is a specified configuration and quality of dimensional lumber and spacers that improves the repeatability of the test method. In this final rule, we are also establishing an alternative compliance option that allows manufacturers to use cord wood for the certification tests. ''Cord wood'' is a different specified configuration and quality of wood that more closely resembles what a typical homeowner would use.

Commenters overwhelmingly agreed that tuning heaters for crib wood certification tests often results in poorer performance in homes. Based on the existence of a viable draft cord wood test method and the expectation at proposal that the ASTM International (formerly known as American Society of Testing and Materials) test methods for cord wood would be complete soon after the NSPS proposal and that significant testing of wood heaters re-tuned to perform well on cord wood would occur before promulgation of this final rule, the EPA proposed to require testing only with cord wood for compliance with Step 2 emissions limits. We still encourage manufacturers to design wood heaters that best represent in-home performance on cord wood that consumers use as soon as possible. However, the ASTM cord wood test methods have not been completed and only limited testing using the draft methods has occurred.

We received numerous comments from noncatalytic stove manufacturers and laboratories and some states with concerns about when the cord wood test methods would be ready and how quickly noncatalytic stoves could be redesigned to perform well with cord wood certification testing that we proposed for Step 2, *i.e.,* 5 years after the effective date. As discussed in the NODA, as of May 2014, we had test data for three catalytic or hybrid wood heaters/stoves that performed very well on cord wood. However, considering all of the above, we have determined that we do not have sufficient data at this time to support a regulatory requirement for cord wood testing.

We expect that many manufacturers will choose the alternative cord wood compliance testing option so that consumers will have more opportunities to purchase stoves that are tuned for in-home use. We will consider alternative cord wood test method requests on a case-by-case basis until we are convinced that improved test methods have been sufficiently demonstrated that they can be relied upon for regulatory purposes. For now, we will be receptive to alternative test method requests that use the current ASTM draft method. Also, we will be receptive to other requests that are sufficiently demonstrated, ideally using the EPA Method 301 validation procedures. Additionally, we expect that within the next few years we will receive enough cord wood test data for the EPA to establish revised certification requirements based on cord wood testing.

The final rule requires that pellets for the certification tests be only those that

have been graded under a licensing agreement with a third-party organization and meet the minimum quality specifications in § 60.532. Commenters indicated that several organizations are currently available and others are planned, for example, the Pellet Fuels Institute (PFI), ENplus and CANplus. Details of the PFI program are available at *http://pelletheat.org/pfi-standards/pfi-standards-program/.* Details of the ENplus program are at *http://www.enplus-pellets.eu/wp-content/uploads/2012/01/ENplus-Handbook-2.0.pdf.* Details of the CANplus program are at *http://control union.ca/fileupload/CA/Certifications/ENplusCANplus/CANplus_handbook_v2-0.pdf.* Manufacturers' data show that pellet fuel quality assurance is necessary to ensure that the appliances operate properly and meet the certified emission limits.

At this time, we lack sufficient data to issue a CO emissions limit in today's final rule. However, this final rule uses our authority under section 114 to require manufacturers to determine CO emissions during the compliance tests (as is typically done already), report those results to the EPA and include those results on the manufacturer's Web site, so that data will be available to consumers, and to the EPA and states for CO NAAQS compliance implementation plan considerations and future wood heater rulemakings. We intend to include context and consumer-friendly summaries of the submitted CO emissions data on the EPA Burn Wise Web site also.

Like the 1988 subpart AAA, this final rule uses the EPA authority under section 114 of the CAA to require each manufacturer to submit applications for certifications of compliance for all new models. We are revising the certification process to include third-party certifiers in order to reduce the potential for certification delays that could result from insufficient capacity. However, commenters expressed concern, which we share, that there may not be sufficient third-party certifier capacity and review and approval capacity by the EPA, especially in the first year. Therefore, to avoid unfairly restricting the production and sales of manufacturers who do all the things they should do and then potentially have to wait on EPA approval, we have added a conditional, temporary approval by the EPA based on the manufacturer's submittal of a complete certification application. The application must include the full test report by an EPA-accredited laboratory and all required compliance statements by the manufacturer. The conditional approval would allow manufacture and sales for 1 year or until EPA review of the application, whichever is earlier. Within that year, the manufacturer must submit a certificate of conformity by a third-party certifier. (In this preamble, we use the terms "third-party certifier," "certifying body," "certifying entity" and "certifying body/entity" interchangeably.)

The EPA is revising the definition of "Accredited Test Laboratory," from only EPA-accredited laboratories to include laboratories accredited by a nationally recognized accrediting body/entity to perform testing for each of the test methods specified in this NSPS under ISO–IEC [6] Standard 17025. Laboratories must be approved by the EPA before beginning certification testing. Current EPA-accredited laboratories may retain their accreditation until 3 years after the effective date of this final rule. Laboratories that are not currently EPA-accredited must achieve ISO-accreditation and register with the EPA within 6 months of the effective date of this rule. Laboratories must report any changes in their accreditation and any deficiencies found under ISO 17025 to the EPA, and the EPA may revoke approval if warranted.

The EPA is requiring a "Certifying-Body-Based Certification Process" beginning 6 months after the effective date of this final rule for all heaters/stoves except hydronic heaters. For hydronic heaters, the "Certifying-Body-Based Certification Process" is required upon the effective date of this final rule because this certification process has already been required under EPA's Hydronic Heater Partnership Program since October 2008. Under this process for all heaters/stoves subject to subparts AAA and QQQQ, after testing is complete, a certification of conformity with the PM emissions limits must be issued by a certifying body with whom the manufacturer has entered into contract for certification services. The certifying body must be accredited under ISO–IEC Standard 17065 and register their credentials with the EPA and receive EPA approval prior to conducting any certifications or related work used as a basis for compliance with this rule and report any changes in their accreditation and any deficiencies found under ISO 17065. Any certifying body that is approved by the EPA and is ISO-accredited is required to act in such a way that will not create a conflict of interest and work with integrity and honesty. The EPA will oversee the certifying body's work and retain the right to revoke the EPA approvals if appropriate. Upon review of the test report and quality control plan submitted by the manufacturer, the certifying body may certify initial compliance and submit the required documentation on behalf of the manufacturer to the EPA's Office of Enforcement and Compliance Assurance for review, approval and listing of the certified appliance.

The rule continues to require the owner or operator of a wood heating appliance to operate the heater consistent with the owner's manual and not burn improper fuel. Owners and operators must operate pellet fuel appliances with the grades of pellet fuels that are included in the owner's manual. Manufacturers are required to void their warranties in cases of improper operation. Numerous states expressed their support for the continuation of these requirements. Some states and local jurisdictions have enforced similar requirements, and this final rule will allow the EPA to approve state requests for delegation of enforcement authority for these NSPS requirements. In addition, we expect many state, local and tribal authorities will adopt some of the important and very successful strategies in *Strategies for Reducing Wood Smoke,*[7] including changing out (replacing) older heaters with newer, cleaner, more efficient heaters and developing site-specific installation and operating requirements to ensure heaters are not over-sized, avoid nuisance conditions, and ensure proper operation, *e.g.,* using EPA Method 22 observations of visible emissions as an indicator of potential poor or improper operation to help ensure healthy air for all.

The rule continues to contain the crucial quality assurance provisions in the 1988 NSPS. For example, manufacturers must request EPA approval of model line re-certifications or new certifications whenever any change is made in the original design that could potentially affect the emissions rate for that model line or when any of several specified tolerances of key components are changed. The 1988 requirements for manufacturer quality assurance programs are strengthened in the revised rule by requiring the manufacturer within 6 months after the effective date to

[6] The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) prepare and publish international standards.

[7] *Strategies for Reducing Residential Wood Smoke.* EPA–456/B–13–001, March 2013. Prepared by Outreach and Information Division, Air Quality Planning Division, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711.

contract for a certifying-body to conduct quality assurance audits within 12 months. The certifying body will conduct regular, unannounced audits to ensure that the manufacturer's quality control plan is implemented properly.

The EPA audit testing programs of the 1988 NSPS are retained under the revised rule, although they are streamlined and simplified to better ensure compliance and to clarify that audits can be based on any information the EPA has available and that audits do not need to be statistically random. Also, the rule clarifies that the EPA and states are allowed to be present during the audits and that states (and other entities, including the public) may provide the EPA with information that may ultimately be used in any EPA enforcement and compliance assurance efforts.

C. Central Heaters: Hydronic Heaters and Forced-Air Furnaces (Subpart QQQQ)

1. Applicability

After the effective date, new heaters will be required to meet the new standards. In this final rule, the EPA is adding 40 CFR part 60, subpart QQQQ, which applies to all new wood-fired residential hydronic heaters, wood-fired forced-air furnaces and any other wood-fired affected appliance defined in subpart QQQQ as a "central heater." Wood-fired means designed or marketed to be capable of burning wood or used to burn wood. For example, a coal-fired heater cannot be marketed as capable of wood-burning unless it meet the requirements of this rulemaking and the marketing brochures and owner's manuals must be clearly specific to coal rather than wood. Hydronic heater means a fuel-burning device designed to burn wood or wood pellet fuel for the purpose of heating building space and/or water through the distribution, typically through pipes, of a fluid heated in the device, typically water or a water and antifreeze mixture. Forced-air furnace means a fuel burning device designed to burn wood or wood pellet fuel that warms spaces other than the space where the furnace is located, by the distribution of air heated by the furnace through ducts.

This new "central heater" categorization better ensures that all appliances affected under this new subpart are included in this final action. Adding subpart QQQQ addresses heater appliance types in the 1987 residential wood heater source category listing that were not regulated by the 1988 NSPS. This new subpart is designed similar to subpart AAA, *i.e.,* certification testing of a representative unit in a model line, label requirements, associated quality assurance requirements and stepped (phased) implementation.

The provisions of subpart QQQQ apply to each affected unit that is manufactured or sold at retail on or after May 15, 2015.

2. Automatic EPA Certification for Currently Certified or Qualified Central Heaters That Meet the Step 1 Emission Levels

In this final rule we make clear that those hydronic heaters with valid EPA Phase 2 qualifications under the voluntary EPA Hydronic Heater Partnership Agreement of October 12, 2011, or hydronic heaters certified by the New York State Department of Environmental Conservation (NYSDEC) that show compliance with the Step 1 emission limits will be automatically deemed EPA certified to meet the Step 1 emission limits under this final rule until the Step 2 compliance date. Also, residential pellet hydronic heaters/boilers that have been qualified under the Renewable Heat New York (RHNY) program will be automatically deemed EPA certified to meet Step 1. (Note that the RHNY program requires pellet heating systems to include installation of thermal storage to maintain high-efficiency and low emissions performance throughout daily and annual cycles. The minimum size thermal storage for boilers less than 85,000 BTU/hr is 119 gallons or 2.0 gallons per 1,000 BTU/hr, whichever is less. For boilers greater than 85,000 BTU/hr, the minimum heat storage is 2.0 gallons per 1,000 BTU/hr.) No separate EPA certification will be required. Similarly, forced-air furnaces independently certified (*i.e.,* not self-tested) under Canadian Standards Association (CSA) B415.1–10 as well as forced-air furnaces certified by the NYSDEC that show compliance with the Step 1 emission limits will be deemed EPA certified to meet the Step 1 emission limits under this final rule until the Step 2 compliance date. This automatic EPA certification will avoid unnecessary economic impacts on those manufacturers (over 90 percent are small businesses) who can then focus their efforts on developing a full range of cleaner models that meet Step 2 emission levels. This measure should also help avoid potential delays at laboratories conducting certification testing for heaters newly subject to the NSPS.

3. Stepped Compliance Approach

We are promulgating a stepped compliance approach that will apply to all new central heaters.

For hydronic heaters, standards will apply to each hydronic heater manufactured after May 15, 2015 and each hydronic heater sold after December 31, 2015. Step 1 p.m. emission limits will apply to each hydronic heaters manufactured on or after May 15, 2015 or sold at retail after December 31, 2015. Step 2 p.m. emission limits will apply to each hydronic heater manufactured or sold at retail on or after May 15, 2020.

For hydronic heaters, we are not promulgating the alternative three-step emission limit approach for which we requested comment in the proposal. The comments overwhelmingly indicated that the three-step emission limit approach was inferior not only environmentally but also economically because it would, in effect, require many small manufacturers to engage in two rounds of R&D rather than one in order to obtain the same eventual endpoint.

For forced-air furnaces, standards will apply to each forced-air furnace manufactured or sold after May 15, 2015. Work practice and operational standards will apply to each forced-air furnace manufactured or sold at retail after May 15, 2015. Step 1 PM emission limits will apply to small (less than 65,000 BTU/hr heat output) forced-air furnaces manufactured or sold on or after May 16, 2016. Step 1 PM emission limits will apply to large (65,000 BTU/hr heat output or larger) forced-air furnaces manufactured or sold on or after May 15, 2017. Step 2 PM emission limits will apply to each forced-air furnace manufactured or sold at retail on or after May 15, 2020.

For forced-air furnaces, we are not promulgating the alternative three-step emission limit approach for which we requested comment in the proposal. The comments overwhelmingly indicated that the three-step emission limit approach was inferior not only environmentally but also economically because it would, in effect, require many small manufacturers to engage in two rounds of R&D rather than one in order to obtain the same eventual endpoint. However, commenters were very concerned about the infeasibility of enforcing an emission limits for forced-air furnaces due to the technical and economic impracticability of testing and certifying approximately 50 forced-air furnaces in the 60 days between publication of this rule and the effective date. For example, a typical forced-air

furnace certification test takes approximately 1 week in the laboratory after the furnace is shipped to the laboratory and a time is scheduled to begin testing. Typically, the laboratory takes approximately 3 or 4 weeks to prepare a complete test report for the manufacturer to submit to the EPA. A reasonable overall estimate is approximately 1.25 months, not counting potential conflicts with other testing in the laboratories. Currently, there are only 4 laboratories that can test forced-air furnaces. We estimate that approximately 12 small forced-air furnaces and 38 large forced-air furnaces would need to be tested as soon as possible. If those tests were to be divided equally among the 4 laboratories, it would take a minimum of approximately 4 months to submit the 12 certification test reports for the small furnaces and an additional year to submit the 38 certification test reports for the large furnaces to the EPA, far longer than the 60 days between the publication date and the effective date. Thus, as noted above, we are requiring work practice and operational standards on the effective date as allowed under section 111(h)(2)(B) of the CAA, and requiring Step 1 PM emission limits for small forced-air furnaces 1 year after the effective date and Step 1 PM emission limits for large forced-air furnaces 2 years after the effective date. Specifically, the manufacturers must develop model-specific descriptions of proper operation and best practices; include them in their owner's manuals; provide training on them to their distributors; and provide them in written and video format to purchasers/operators/users of their heaters. The specific details that must be included in owner's manuals are in § 60.5474 and Appendix I of this rulemaking.

The following are excerpts of the operational standards required in this rule that must be included in the owner's manuals. Operators must not burn unseasoned wood.

The use of properly split, stored and seasoned wood has much lower PM emission than high-moisture wood, *i.e.*, green wood or wet wood. Operators must not burn improper fuels such as (1) residential or commercial garbage; (2) lawn clippings or yard waste; (3) materials containing rubber, including tires; (4) materials containing plastic; (5) waste petroleum products, paints or paint thinners, or asphalt products; (6) materials containing asbestos; (7) construction or demolition debris; and (8) paper products; cardboard, plywood or particleboard (Note that best practices do allow the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected heater); (9) railroad ties or pressure treated lumber; (10) manure or animal remains; (11) salt water driftwood or other or other previously salt water saturated materials; (12) unseasoned wood; and (13) any materials that are not included in the warranty and owner's manual for the subject heater or furnace.

The owner's manual and training materials must also educate operators on the use of proper operating practices, including correct positioning of bypasses and air dampers during startup, normal operation and reloading. Proper practices also include checking air tubes, catalysts (if so equipped), heat exchangers and other critical parts of the heater to ensure they are working properly and are maintained as needed. Best burn operational practices are already highlighted in many manufacturers' owner's manuals, educational materials from HPBA and Burn Tips on EPA's Burn Wise Web site. Numerous comments noted that best work practices and proper operation and maintenance can significantly reduce emissions at reasonable costs. Thus, considering all of the above, the EPA has determined that these work practice and operational standards represent the best systems of emission reduction as required by section 111(h)(1) for the immediate time frame from the effective date until the Step 1 PM emissions limits apply. More discussion of comments on stepped compliance and the EPA's responses are in section V. Summary of Major Comments and Responses.

Table 4 summarizes the PM emissions limits for hydronic heaters and forced-air furnaces that will apply at each step. Note that the emissions standards are "as measured" by the test methods specified in the rule and are labeled as PM although the PM is essentially all $PM_{2.5}$. This avoids the potential extra testing costs of measuring $PM_{2.5}$ specifically.

TABLE 4—SUBPART QQQQ PM EMISSIONS LIMITS

Appliance	Steps	Particulate matter emissions limits
Residential Hydronic Heater	Step 1: on or after May 15, 2015	0.32 lb/mmBtu heat output (weighted average) and a cap of 18 g/hr for each individual test run.
	Step 2: on or after May 15, 2020	0.10 lb/mmBtu heat output for each individual burn rate.
	Step 2: cord wood alternative compliance option	0.15 lb/mmBtu heat output for each individual burn rate.
Forced-Air Furnace	Work practice and operational standards: on or after May 15, 2015.	No specific PM limit.
	Step 1 for small furnaces: on or after May 16, 2016	0.93 lb/mmBtu heat output (weighted average).
	Step 1 for large furnaces: on or after May 15, 2017	0.93 lb/mmBtu heat output (weighted average).
	Step 2 for small or large furnaces: on or after May 15, 2020 (using cord wood as specified in CSA B415.1–10).	0.15 lb/mmBtu heat output for each individual burn rate.

We are allowing an alternative compliance option for manufacturers who choose to certify using cord wood (rather than crib wood) to meet the Step 2 limits for hydronic heaters. The proposal would have required cord wood testing for all Step 2 compliance certifications. Cord wood testing is a better measure of how stoves actually perform in home use; however, we are concerned that many manufacturers (over 90 percent are small businesses) do not yet have experience with designing their stoves to perform well with cord wood testing. Numerous hydronic heater manufacturers may not be ready by the Step 2 compliance date and that could result in unreasonable economic impacts. Allowing this option acknowledges the efforts of the industry leaders and encourages others to follow their example. Special (required) permanent and (voluntary) temporary labels for heaters certified with cord wood would specify that they meet a PM emissions limit of 0.15 lb/mmBtu heat output. The Step 2 PM emission

limit for forced-air furnaces matches the hydronic heater alternate cord wood option emission level of 0.15 lb/mmBtu because CSA B415.1–10 already specifies cord wood for the certification tests. The bases for the emission levels are discussed in section V.B BSER and Particulate Emission Limits for Central Heaters (subpart QQQQ).

We are making a single determination of BSER for catalytic, noncatalytic, hybrid, cord wood and pellet heaters and furnaces in order to not restrict open market competition. We are requiring manufacturers to provide warranties on the catalysts, prohibit the operation of catalytic heaters and furnaces without a catalyst and require operation according to the owner's manual. In addition, we are requiring manufacturers to provide warranties for noncatalytic and hybrid heaters and furnaces and require operation according to the owner's manual.

As discussed at proposal, we considered requiring efficiency standards (heat output divided by fuel input) to ensure that heaters are efficient and burn no more wood than necessary for the heat demand so that the consumers can save money on fuel and so that the emissions are lower. We did not propose an efficiency standard because we concluded we do not yet have sufficient data, but the final rule uses our section 114 authority to require efficiency testing and reporting to the EPA. We will include context and summaries of this information on the EPA Burn Wise Web site. This will help better inform consumers so they can choose the best-performing heaters now that will also save them money on fuel costs and also reduce PM emissions by burning less wood. This will also provide data to states and the EPA as we consider future wood heater rulemaking.

At this time, we lack sufficient data to issue a CO emissions limit in today's final rule. However, this rule uses our section 114 authority to require manufacturers to determine CO emissions during the compliance tests (as typically conducted), report those results to the EPA and include those results on the manufacturer's Web site. This will help better inform consumers so they can choose the best-performing heaters that have less CO emissions and less health concerns for themselves and their neighbors. This will also provide data to states and the EPA as we consider future rulemaking. We intend to include context and summaries of the submitted CO emissions data on the EPA Burn Wise Web site also.

In this final rule, we are not setting limits on visible emissions, and we are not prohibiting use in non-heating seasons. However, operators should note that some state, local and tribal jurisdictions have limits, prohibitions and other requirements that must be followed.

Like the subpart AAA requirements, the subpart QQQQ requirements provide additional time for the sale of unsold hydronic heaters manufactured before the compliance date. This additional sell-through time does not include forced-air furnaces because EPA has determined that it is reasonable for forced-air furnace manufacturers to revise their owner's manuals, training and marketing materials to comply with the work practice and operational standards by the effective date.

As in subpart AAA, subpart QQQQ includes a list of prohibited fuels because their use would cause poor combustion or even hazardous conditions. As in subpart AAA, subpart QQQQ requires that the owner or operator must operate the hydronic heater or forced-air furnace in a manner that is consistent with the owner's manual and the rule requires the manufacturer to discuss the best operating practices in the owner's manual. For pellet-fueled appliances, operation according to the owner's manual includes operation only with pellet fuels that are specified in the owner's manual. As in subpart AAA, manufacturers must only specify graded and licensed pellets that meet certain minimum requirements. Data show that pellet quality is important to ensure that the appliances operate properly such that emissions are within the appliance certification limits.

The permanent labeling requirements and owner's manual requirements in subpart QQQQ are similar to the guidelines in the EPA's current voluntary hydronic heater program with some improvements. Like in subpart AAA, the temporary labels (hangtags) are voluntary and are only for models that meet Step 2 levels before the compliance date and these hangtags end upon the Step 2 compliance date. Subpart QQQQ also has a cord wood alternative compliance option with a special permanent label and a voluntary temporary label (hangtag) for models that meet Step 2 using cord wood. The structure of the rest of subpart QQQQ is similar to the subpart AAA certification and quality assurance process.

4. Emission Testing, Reporting and Certification

The final rule requires that before manufacture and sale at retail, all affected hydronic heaters and forced-air furnaces subject to subpart QQQQ must conduct certification compliance testing, submit a certificate of compliance and receive EPA approval for the Step 1 and Step 2 PM emission limits by the dates shown in Table 4.

For hydronic heaters, we are requiring emission testing, reporting and certification based on crib wood to demonstrate compliance with Step 1 and Step 2 emissions limits. The final rule requires crib wood emission testing of hydronic heaters by one of the following methods: EPA Method 28WHH in its entirety or EPA Method 28WHH–PTS (with approved adjustment for crib wood versus cord wood) or ASTM E2618–13 with conditions or European National (EN) test method EN 303–5 with conditions. We note that EPA's current NSPS general provisions provide that affected sources may request EPA approval of alternative test methods on a case-by-case basis as appropriate. See 40 CFR 60.8(b).

Commenters overwhelmingly agreed that tuning heaters for crib wood certification tests often results in poorer performance in homes. Based on the existence of viable draft cord wood test methods and the expectation that the ASTM test methods would be final soon after the NSPS proposal and that significant testing of heaters re-tuned to perform well on cord wood would occur before promulgation of this final rule, the EPA proposed to require testing with cord wood for the Step 2 emissions limits. We still encourage manufacturers to design wood heaters that best represent in-home performance on cord wood that consumers use as soon as possible. However, the ASTM cord wood test methods have not been completed and only limited testing using the draft methods has occurred.

We received numerous comments with concerns about when the cord wood test methods would be ready and how quickly heaters could be redesigned to perform well with cord wood certification testing that we proposed for Step 2, *i.e.,* 5 years after the effective date. At proposal, we had limited test data for heaters using cord wood. Considering all of the above, we have determined that we do not have sufficient data at this time to adequately support a regulatory requirement for cord wood testing.

We expect that many manufacturers will choose the alternative cord wood compliance testing option so that consumers will have more opportunities to purchase stoves that are tuned for in-home use. We will consider alternative cord wood test method requests on a case-by-case basis until we are convinced that improved test methods

have been sufficiently demonstrated that they can be relied upon for regulatory purposes. For now, we will be receptive to alternative test methods requests that use the current ASTM draft methods. We will also be receptive to other alternative test method requests that are adequately demonstrated, ideally according to the EPA Method 301 validation procedures. Additionally, we expect that within the next few years we will receive enough cord wood test data for the EPA to establish revised certification requirements based on cord wood testing.

In this final rule, the EPA is relying on the cord wood test method that has been developed by the CSA for forced-air furnaces. The current version of CSA B415.1–10 was published in March 2010, and it includes not only the forced-air furnace test method but also Canadian emission performance specifications for indoor and outdoor central heating appliances.

In this final rule, we are relying on efficiency test methods that have been developed by the CSA. The current version of CSA B415.1–10 was published in March 2010.

As discussed earlier in section III.B.4 of this preamble, regarding the certification process for room heaters (revised subpart AAA), we are also requiring third-party certifiers for hydronic heaters and forced-air furnaces so as to reduce the potential for certification delays that could result from errors in testing. However, for forced-air furnaces, we are concerned that there may not be sufficient third-party certifier capacity specific to forced-air furnace testing according to the CSA B415.1–10 test method and review and approval capacity by the EPA, especially in the first year. We do not want to unfairly restrict the production and sales of forced-air furnace manufacturers who do all the things they should do and then potentially have to wait on EPA approval. Thus, we have added a conditional, temporary approval by the EPA for forced-air furnaces based on the manufacturer's submittal of a complete certification application. The application must include the full test report by an EPA-approved laboratory and all required compliance statements by the manufacturer. The conditional approval would allow forced-air furnace manufacture and sales for 1 year or until EPA review of the application, whichever is earlier. Within that year, the manufacturer must submit a certificate of conformity by a third-party certifier.

The 1-year conditional, temporary approval by the EPA does not apply to hydronic heaters because they have been required to submit third-party certifications for the EPA hydronic heater voluntary partnership program since 2008 and will continue to do so under this NSPS.

IV. Summary of Significant Changes Following Proposal

This section is a summary of the significant changes from the proposed rule based on the comments and additional material we received and have carefully considered. The reasons for these changes and their potential impacts are in the Response to Comments (RTC) document and are summarized in section V Summary of Major Comments and Responses.

A. Best Systems of Emission Reduction/ Particulate Emission Limits

We received considerable comment on the proposed PM emission limits that is relevant to our determination of BSER. As explained in more detail in section V, these final emission limits represent significant advances in stove technology and substantial reductions in emissions, both collectively and from individual units.

1. Room Heaters

The EPA is changing the proposed Step 2 PM emissions limit for new residential room heaters, including catalytic and noncatalytic adjustable rate wood heaters, single burn rate wood heaters and pellet heaters/stoves from 1.3 g/hr to 2.0 g/hr using crib wood. Compliance for room heaters will be determined using the weighted average of burn rates rather than requiring each individual burn rate to meet the limit. To reduce potential certification delays and unnecessary costs for small businesses, we are adding an automatic Step 1 EPA approval for models with valid EPA certifications under the 1988 NSPS that show that the models achieve the Step 1 emission levels. Manufacturers may choose to test using either crib wood or cord wood. If the manufacturers choose the cord wood alternative compliance option, the PM emission limit for cord wood is 2.5 g/hr. Although the number is higher, the cord wood test method is more reflective of fuel that is used in homes and the data available to the EPA indicate that this PM emission level is at least as stringent as the 2.0 g/hr primary crib wood testing emission limit. More details on this are in section V.A Summary of Major Comments and Responses.

For wood heater/stove certification tests using cord wood, the EPA is allowing (voluntary) manufacturers to use a special EPA label which recognizes that cord wood testing more closely reflects actual in-home use.

2. Central Heaters: Hydronic Heaters and Forced-Air Furnaces

For new residential hydronic heaters, the final rule keeps the proposed Step 1 weighted average PM emission rate of 0.32 lb/mmBTU heat output, establishes a Step 1 PM emissions cap of 18 g/hr for any individual test run and adds automatic Step 1 EPA certification for hydronic heater models if they are already qualified as meeting the Phase 2 emissions level of the EPA's voluntary program. The change from the proposed Step 1 cap of 7.5 g/hr to the final rule Step 1 cap of 18 g/hr was to match the Phase 2 emission levels of the EPA voluntary program and reduce potential certification delays. To further reduce potential certification delays and unnecessary costs for small businesses, we are also adding automatic Step 1 EPA certification for hydronic heater models certified by NYSDEC that demonstrate the models achieve the Step 1 levels and RHNY-qualified pellet hydronic heaters. Similarly, we are adding automatic Step 1 EPA certification for new forced-air furnaces that are independently certified (*i.e.,* not self-tested) under CSA B415.1–10 to meet the Step 1 emission level or that are certified by NYSDEC and meet the Step 1 emission level. For forced-air furnaces for Step 1, we deleted the 7.5 g/hr particulate emission limit per individual burn rate because the CSA B415.1–10 certifications are based on the weighted average, not the g/hr limit, and because the manufacturers do not have experience with meeting g/hr limits for these furnaces.

For hydronic heaters, we are changing the proposed Step 2 PM emissions limit of 0.06 lb/mmBtu heat output to 0.10 lb/mmBtu heat output for each individual burn rate, tested on crib wood. Manufacturers may choose to test using either crib wood or cord wood. If the manufacturer chooses the cord wood alternative compliance option, the Step 2 PM emission limit for cord wood is 0.15 lb/mmBtu heat output. Although the number is higher, the cord wood test method is more reflective of the fuel that is used in homes and the limited cord wood data available to the EPA indicate that this PM emission level is at least as stringent as the 0.10 lb/mmBtu heat output crib wood testing emission limit. For forced-air furnaces, the Step 2 PM emission level matches the hydronic heater cord wood

alternative option because forced-air furnaces are certified using CSA B415.1–10, which already specifies cord wood as the test fuel. Details on the bases of the emission levels are in section V, Summary of Responses to Major Comments.

For hydronic heaters and forced-air furnaces tested with cord wood, the EPA is allowing (voluntary) manufacturers to use special permanent labels and EPA temporary labels (hangtags) which recognize that cord wood testing more closely reflects actual operation under in-home-use conditions.

3. Masonry Heaters

As stated in section III of this preamble, the EPA is not taking final action on proposed subpart RRRR for new residential masonry heaters at this time. Comments indicated that the Masonry Heater Association (MHA) needs more time to finish their efforts to develop revised test methods, alternative compliance calculation procedures and dimensioning procedures. The MHA comments stated that the cost of testing masonry heaters is high and impractical because almost all are custom-built onsite. After we receive additional information from MHA and others, we will consider if we should take final action for new residential masonry heaters in a future rulemaking.

The potential emission impact of this delay is small. Fewer than 1,000 masonry heaters are built each year. Most manufacturers build fewer than 15 heaters per year. The total nationwide annual emissions are estimated to be less than 10 tons of $PM_{2.5}$.

B. Appliance Certification, Laboratory Accreditation and Third-Party Certification

In section III.D of the preamble to the proposed rule, we described the proposed approach for a third-party certification program by an ISO-accredited certifying body and testing by ISO-accredited testing laboratories. This approach requires manufacturers to use third-party, independent ISO-accredited and EPA-approved test labs and certifying entities to demonstrate compliance with a representative appliance for a model line.

Under the Administrator Approval Process (see § 60.533(c) of the proposed rule), we proposed a transition period of 1 year from the effective date of the final rule for test labs to receive ISO accreditation through an EPA-recognized accreditation body. In this final rule, we are increasing the transition period for test laboratories that are currently EPA-accredited from 1 year to 3 years from the effective date of this final rule (*i.e.,* until May 15, 2018). This additional time for test laboratory accreditation will reduce concerns about costs for these small laboratories and potential testing delays.

We proposed that certifying entities be required to receive ISO accreditation upon the effective date of the final rule; however, commenters stated that ISO accreditations can take 6 months. Requiring use of ISO-accredited certifying bodies/entities on the effective date of the final rule can be difficult for small manufacturers of wood stoves/heaters and forced-air furnaces, which previously have not been required to obtain certifications from ISO-accredited certifying bodies/entities; therefore, we are allowing a 6-month transition for models other than hydronic heaters. The 6-month transition period does not apply to hydronic heaters because the use of ISO-accredited certifying bodies/entities has been part of the EPA's voluntary partnership program for hydronic heaters since 2008.

C. Cost and Economic Impacts

Cost and economic impacts of the proposed rule have been revised to reflect changes to the standards and improved estimates of costs and emissions for room heaters and central heaters. See section VI of this preamble for a discussion of these revised impacts, as well as the RIA and the RTC document for this final rule for more detailed information.

D. Test Methods and Compliance Certification Calculation Procedures

The EPA proposed a number of changes to test methods established under the 1988 rule to improve their precision and to better reflect real-world conditions.

1. Burn Rates in Compliance Certification Calculations

For Step 2 emission limits, we proposed to require certification compliance at the lowest burn rate (Category 1) and the maximum burn rate (Category 4) rather than the weighted average of the four burn rates, which was required in the 1988 rule.

Many comments on the proposal and the data in the NODA strongly supported the proposed compliance determinations per individual burn rates. Many other comments strongly opposed the proposal. Considering all of the comments and focusing on the available test data, especially the EPA wood stove certification test data by burn rate that we included in the July 1, 2014, NODA, we are requiring certification calculations based on the weighted average of the four burn rates for subpart AAA. More detail is presented in section V.A, BSER and Particulate Emission Limits for Room Heaters (revised subpart AAA), and section V.F, Test Methods.

For subpart QQQQ, the final rule uses the weighted average with a cap for each test run for Step 1 (for hydronic heaters), but retains the proposed requirement for compliance at each burn rate for Step 2 (for both hydronic heaters and forced-air furnaces), given concerns about the sometimes very large emissions at individual burn rates. The emission limits reflect the data available. For a more detailed discussion of these comments and responses, see the RTC document in the docket for this rule.

2. Cord Wood Test Method

Based on the existence of viable draft cord wood test methods and the expectation at proposal that the ASTM "real world" test methods for cord wood would be complete soon after the NSPS proposal and that significant testing of wood heaters re-tuned to perform well on cord wood would occur before promulgation of this final rule, the EPA proposed to require testing only with cord wood for compliance with Step 2 emissions limits. We still encourage manufacturers to design wood heaters that perform best on cord wood that consumers use. However, the ASTM cord wood test methods have not been completed and only limited testing using the draft methods has occurred. We received numerous comments from noncatalytic stove manufacturers and laboratories and some states with concerns about when the cord wood test methods would be ready and how quickly noncatalytic stoves could be redesigned to perform well with cord wood certification testing that we proposed for Step 2, *i.e.,* 5 years after the effective date. (We had test data for three catalytic or hybrid wood heaters/stoves that performed very well on cord wood at the time of proposal.) However, considering all of the above, we have determined that we do not have sufficient data at this time to support a regulatory requirement for cord wood testing (other than for forced-air furnaces), but rather will allow an alternative compliance option for cord wood testing. (Note that forced-air furnace certification tests are conducted according to CSA B415.1–10 which has specified cord wood as the test fuel since 2010.)

We expect that many manufacturers will choose the alternative cord wood

compliance testing option so that consumers will have more opportunities to purchase stoves that are tuned for use in the "real world." We will consider alternative cord wood test method requests on a case-by-case basis until we are convinced that improved test methods have been sufficiently demonstrated that they can be relied upon for regulatory purposes. For now, we will be receptive to alternative test methods requests that use the current ASTM draft methods. Also, we will be receptive to other alternative test method requests that are adequately demonstrated, ideally according to the EPA Method 301 validation procedures. Additionally, we expect that within the next few years we will receive enough cord wood test data for the EPA to establish revised certification requirements based on cord wood testing.

See section III of this preamble for the specific alternative compliance emissions limit options we are allowing under subparts AAA and QQQQ for manufacturers of heaters who choose to certify compliance with cord wood instead of crib wood. The bases for the options are discussed in section V, Summary of Responses to Major Comments.

3. Additional Test Methods

Based on comments and the need to minimize potential testing and certification delays for Step 1, the final rule includes additional test methods for hydronic heaters. In addition to the proposed use of EPA Method 28WHH and EPA Method 28WHH–PTS, the final rule allows manufacturers to use ASTM E2618–13 and EN303–05 with specified conditions/adjustments (*e.g.,* burn rate categories to better match EPA Method 28WHH and use of thermal storage) for determining compliance with the Step 1 emission limits. As with all NSPS, manufacturers may request EPA approval of alternative test methods on a case-by-case basis. See 40 CFR 60.8.

E. Sell-Through of Inventory

Based on numerous comments from small business manufacturers and small business retailers and some states, we are lengthening the retail sell-through period for subpart AAA from 6 months from the effective date of the final rule to December 31, 2015, approximately 8 months from the expected effective date. That is, no manufacturer, distributor, wholesaler or retailer may sell or offer to sell new stoves after December 31, 2015, that do not meet the Step 1 emission limit. Eight months will better cover the primary selling period after the rule is final and will affect a very small number of appliances. We are also providing a retail sell-through period for subpart QQQQ hydronic heaters to also cover the primary selling period. We are not allowing a retail sell-through period for forced-air furnaces because the manufacturers and retailers can quickly revise the owner's manuals to add best burn practices to comply with the work practice and operational standards. These sell-through provisions do not affect resale of used stoves/heaters; such resale is not restricted by this rule.

F. Appeals and Administrative Hearing Procedures

Based on the public comments and our additional review of the history of the 1988 rule, we have determined that there is no need to make the proposed change to a streamlined Petition for Review process. Therefore, we are retaining the Appeals and Administrative Hearing Procedures outlined in the 1988 rule.

V. Summary of Responses to Major Comments

Detailed summaries are in the RTC document in the docket.

A. BSER and Particulate Emission Limits for Room Heaters (Revised Subpart AAA)

We received a full range of comments on the proposed BSER and emission limits for room heaters and the data in the July 1, 2014, NODA. Many comments agreed completely with our proposal and that approximately 10,000 tons/yr of $PM_{2.5}$ emission reduction is very important and would lead to significant improvement in public health protection.

Some comments indicated that bans of wood burning would be more appropriate. The EPA is not banning wood burning in this rule because section 111(a)(1) of the CAA requires that the emission standards reflect the degree of emission limitation achievable by the application of BSER.

Some comments suggested that we develop less stringent standards for rural areas than other areas or no standards in rural areas at all. The EPA is not setting different emission standards for rural areas because section 111 of the CAA does not provide legal authority for differentiated standards based on where the devices are used.

1. Stringency of Step 2 Level Using Cord Wood for Room Heaters

Many noncatalytic stove manufacturers and laboratories and some other manufacturers were concerned especially about the stringency of the Step 2 level using cord wood 5 years after the effective date. We considered all comments and focused on those that discussed the emission data in detail.

Numerous small business manufacturer comments suggested that (1) current stove designs are focused on burning crib wood well at the expense of burning "real world" cord wood well, and stoves cannot just be tweaked to burn both well; (2) experience in homes is that some crib wood-certified stoves smolder if the homeowner does not operate them at high burn for at least 30 minutes before dampening down to the low burn rate settings; (3) a cord wood test method more representative of in-home use should be developed as soon as possible; and (4) a voluntary option should be used to establish a cord wood database to determine BSER.

As discussed in the NODA, limited cord wood testing by Brookhaven National Laboratory (BNL), under contract to the EPA, showed that repeatability of the cord wood test method results can sometimes be very good (*i.e.,* within 15 percent). However, the results of the BNL cord wood tests also showed that emissions from a popular, inexpensive, current-model noncatalytic stove that was not adjusted by the manufacturer for burning cord wood instead of crib wood during the certification test can be much higher than (in several cases, over twice as high) the crib wood emission test results.

Other comments suggested that we stay with the proposed cord wood testing requirement and proposed Step 2 emission level that some heaters can already meet. For example, Washington State Department of Ecology (WSDOE) stated that (1) the data show that hybrid stoves are the best technology capable of meeting Step 2, better than noncatalytic stoves; and (2) the extensive lack of Category 1 burn rate data in the certification tests indicates a "serious flaw" and that EPA needs to develop test methods more representative of in-home use that include start-up and the lowest burn rate at which a device may be commonly operated. We agree with WSDOE that it appears that hybrid stoves may be the best technology capable of meeting Step 2, better than noncatalytic stoves; however, we are concerned about setting required emission levels that may have potential impacts on a large number of small businesses that may not yet have much experience with that technology, and we do not want to prematurely restrict their choices. As discussed in section IV.D, we agree that test methods are needed that better reflect in-home use and include start-up and the lowest burn

rate at which a device may be commonly operated.

As discussed earlier in this preamble, based on the data and comments, we have determined that it is premature to require a cord wood-based Step 2 emission limit at this time. Rather, we are basing the Step 2 requirements on crib wood testing and including an alternative compliance *option* to encourage manufacturers to certify with cord wood as soon as possible to provide consumers with better information regarding in-home use.

In support of the cord wood alternative compliance option, there are three stove model lines that meet Step 2 using cord wood testing. As discussed in section IV.D of this preamble, we expect additional manufacturers will choose the alternative cord wood compliance testing option so that consumers will have more opportunities to purchase stoves that are tuned for in-home use. We will consider alternative cord wood test method requests on a case-by-case basis until we are convinced that improved test methods have been sufficiently demonstrated that they can be relied upon for regulatory purposes. For now, we will be receptive to alternative test method requests that use the current ASTM draft methods. We will also be receptive to other alternative test method requests that are adequately demonstrated, ideally according to EPA Method 301 validation procedures. We expect that within the next few years we will receive enough cord wood test data for the EPA to establish revised certification requirements based on cord wood testing.

Commenters overwhelming agree that cord wood testing is a better representation of ''real world'' conditions, provides better information for consumers to choose the cleanest and most efficient heaters and that the EPA should encourage cord wood testing. Thus, the final rule includes a cord wood alternative compliance option for Step 2 and special permanent labels and allows (voluntary) temporary EPA labels (hangtags) for units tested with cord wood. As discussed earlier in this section, the proposal reasonably anticipated that all manufacturers would iteratively adjust the combustion air flows, directions and proportions to better match the change in hydrocarbon volatilization rate due to the difference in surface-area-to-volume ratio and spacing for crib wood versus cord wood. The proposal also reasonably anticipated that manufacturers would have a full complement of cord wood tested heaters available by Step 2, *i.e.,* 5 years after the effective date. Some stoves already perform well on cord wood. However, comments from some small business noncatalytic stove manufacturers, small business laboratories and some states have questioned whether most small business manufacturers could comply with the Step 2 emission limits based on cord wood by that date. As discussed in the NODA, the cord wood test data submitted to us for three catalytic or hybrid wood stoves manufactured by two small businesses show that their EPA-certified wood stoves (when tested using cord wood and making no design changes to adjust for testing using cord wood versus crib wood) have similar emissions as their stoves do when tested using crib wood. The cord wood results show that they can achieve an emission limit of 1.3 g/hr, as proposed. Several comments stated that they did not believe these results are representative of most EPA-certified stoves and that typical cord wood values are likely to be higher than the 1.3 gr/hr level, as well as the 2.0 g/hr level of the final crib wood Step 2 emission level or any other crib wood level.

Recognizing that the cord wood alternative compliance option is an option rather than a requirement, we have set the cord wood Step 2 emission level at 2.5 g/hr as the alternative compliance option for room heaters for the following reasons:

- Test data show that at least three wood stoves meet a limit of 1.3 g/hr, which (coupled with some commenters' claims that the test precision is no better than 1.0 g/hr) would suggest an achievable limit on the order of 2.3 g/hr.
- The State of Washington DOE has required catalytic stoves since 1995 to meet a limit of 2.5 g/hr.
- The Step 2 emission level does not take effect until 5 years after the effective date of this final rule.

The cord wood alternative compliance option provides appropriate opportunities to small manufacturers who have been leaders in optimizing for cord wood performance and encourages other manufacturers to follow their example. More discussion is in the RTC document in the docket for this final rule.

2. Stringency of Step 2 Level Using Crib Wood for Room Heaters

We have set the crib wood Step 2 emission limit at 2.0 g/hr for the following reasons:

- Focusing on the comments that discussed the details of the crib wood certification test data for Step 2, nearly 90 percent of current catalytic/hybrid stoves and over 18 percent of current noncatalytic stoves would meet the Step 2 emission limit of 2.0 g/hr in the final rule. This compares to 20 percent of catalytic/hybrid wood heaters/stoves and only 3 percent of noncatalytic wood heaters/stoves for the proposed 1.3 g/hr Step 2 emission limit.
- Considering that current stove sales are approximately 20 percent catalytic/hybrid stoves and 80 percent noncatalytic stoves, the estimated impact of adjusting the Step 2 emission level from 1.3 g/hr to 2.0 g/hr will be to decrease the emission reduction estimated for this rule by approximately 36 tons per year, which is relatively small compared to the rule's total estimated emission reduction of 8,269 tons per year. Furthermore, the impact for any individual stove is only on the order of 2 pounds per year.
- The final Step 2 emission limit of 2.0 g/hr is more stringent than any current state requirement.

Thus, considering the significant emission reductions for this final rule and the potential significant cost impacts for this industry that is comprised of over 90 percent small businesses, and considering that the difference between the proposal and this final rulemaking is less than approximately 36 tons per year compared to the 8,269 tons per year for this final rulemaking, we judge that a final Step 2 emission level of 2.0 g/hr within 5 years as BSER for room heaters is a reasonable balance of environmental impacts and costs.

3. Determination of BSER for Room Heaters

Some comments questioned that BSER is adequately demonstrated. The data in the paragraph above show that not only are the emission levels demonstrated, the percentages of current heaters that already meet Step 2 demonstrate the reasonableness of the Step 2 emission limit, especially considering that the Step 2 emission limit becomes applicable 5 years after the effective date.

Some comments recommended that the final rule be as stringent as the cleanest stoves on the market and some comments suggested numbers that reflect the top 5 percentile. Section 111 of the CAA does not specify any particular floor for BSER determinations but does require consideration of costs. As discussed above, considering that the emission reduction difference between the proposal and this final rulemaking is approximately 36 tons per year (compared to the 8,269 tons per year for this final rulemaking), we judge that a final Step 2 BSER of 2.0 g/hr within 5

years is a reasonable balance of environmental impacts and costs.

Some comments suggested that the precision of the test method is not good enough to set emission limits more stringent than the 1988 NSPS. In response, we note that the State of Washington DOE has successfully required a 2.5 g/hr emission limit for catalytic stoves since 1995, and several stoves have been EPA-certified at 1.0 g/hr, which is well under the final Step 2 emission limit of 2.0 g/hr. Even if the commenters' claims were correct that the precision is no better than 1.0 g/hr, the final emission limit of 2.0 g/hr would still cover these stoves, *i.e.,* 1.0 g/hr plus 1.0 g/hr equals 2.0 g/hr, the step 2 emission limit. Further, we note that the final rule deletes the previously required upward adjustment for Method 5G to 5H, which was sometimes over a 30 percent increase for certification values (under the 1988 NSPS and the State of Washington DOE) that were tested using Method 5G.

B. BSER and Particulate Emission Limits for Central Heaters (Subpart QQQQ)

Comments of many small business manufacturers of hydronic heaters and forced-air furnaces questioned the demonstrations of BSER for hydronic heaters and forced-air furnaces, especially the proposed cord wood Step 2 limit of 0.06 lb/mmBtu. As discussed earlier in sections III.B and III.C of this preamble, considering the numerous comments expressing concern about whether most small business manufacturers will be ready in time, reviewing the data currently available, and acknowledging that the expected ASTM cord wood test methods are not yet completed at this time, we have determined that it is premature to require cord wood certification tests for hydronic heaters at this time. Rather, we are allowing a cord wood alternative compliance option.

1. Stringency of Step 1 Level Using Crib Wood for Central Heaters

Focusing on the crib wood test primary requirement and crib wood test data, we see that there are already 50 hydronic heater models Phase 2 qualified under the EPA hydronic heater voluntary partnership program, which also meet the Step 1 emission levels of this final NSPS. These models will be automatically deemed EPA-certified for Step 1 of this final NSPS. (There are also 19 voluntary program qualification tests recently submitted to the EPA that, if valid, will result in 19 additional Phase 2 model qualifications.) Similarly, models certified by the NYSDEC that comply with Step 1 will also be automatically deemed EPA certified until Step 2. Also, over 20 pellet heaters/boilers are already qualified under the RHNY program, and they will be automatically deemed to be EPA-certified for Step 1 provided they comply with the RHNY requirements for installation and operation with adequate thermal storage. That is, no additional certification will be necessary for these three groups for Step 1.

For forced-air furnaces, commenters indicated that the Step 1 p.m. emission limit was achievable but small furnaces needed 1 year and large furnaces needed 2 years to complete the certification testing. As discussed earlier, the final rule incorporates the necessary additional time for testing.

2. Stringency of Step 2 Level Using Crib Wood for Central Heaters

For new residential hydronic heaters, we have set the crib wood Step 2 emission level at 0.10 lb/mmBtu based on the following:

- Looking at the crib wood test primary requirement for Step 2 (0.10 lb/mmBtu), 9 of the 50 (18 percent) EPA-qualified hydronic heater models currently achieve Step 2 on crib wood (per run); and all 20 of the RHNY-qualified models achieve 0.10 lb/mmBtu.
- The proposed Step 2 level (0.06 lb/mmBtu) currently is achieved only by 3 of the 49 (6 percent) EPA-qualified models (per run).
- The emission reduction difference between the proposed Step 2 hydronic heater emission level (0.06 lb/mmBtu) and the final Step 2 hydronic heater emission level (0.10 lb/mmBtu) is approximately only 15 tons per year (compared to the 8,269 tons per year for this final rulemaking).

Considering the potential significant cost impacts for this industry that is comprised of over 90 percent small businesses, and that the relatively small difference in emission reductions between the proposal and this final rulemaking, we judge that a final hydronic heater Step 2 emission level of 0.10 lb/mmBtu within 5 years as BSER is a reasonable balance of environmental impacts and costs.

3. Stringency of Step 2 Level Using Cord Wood for Central Heaters

As with room heaters (subpart AAA) and for the same reasons, hydronic heaters (subpart QQQQ) have a cord wood alternative compliance option. Considering that it is an option designed to encourage leadership for others to follow, that it is an option rather than a requirement and that many European models already achieve levels better than 0.06 lb/mmBtu, we have determined that 0.15 lb/mmBtu within 5 years as the cord wood alternative compliance option is a reasonable balance of environmental impacts and costs. We note that the RHNY emission qualification requirement is 0.08 lb/mmBtu. Further, we note that even if there were to be method uncertainty on the order of approximately four times the expected precision of 35 percent, models at 0.06 lb/mmBtu would still be included.

We have set the same final Step 2 emission level for forced-air furnaces as BSER as we have for hydronic heaters based on the following:

- The emission reduction difference between the proposed forced-air furnace Step 2 emission limit of 0.06 lb/mmBtu and this final rulemaking (0.15 lb/mmBtu) is approximately 40 tons per year (compared to 8,269 tons per year emission reduction for this final rulemaking). The difference is slightly larger for forced-air furnaces compared to hydronic heaters because the annual sales of forced-air furnaces are much larger (*i.e.,* 41,000 versus 13,000).
- We considered the potential significant cost impacts for this industry that is comprised of over 90 percent small businesses, as well as the modest difference between the environmental impacts of the proposal and this final rulemaking. Therefore, for forced-air furnaces, we judge that a final Step 2 emission level of 0.15 lb/mmBtu within 5 years as BSER is a reasonable balance of environmental impacts and costs.

Since forced-air furnaces and indoor hydronic heaters compete in the same market, wise consumers expect similar performance. We expect most forced-air furnace manufacturers to transfer technology and knowledge from wood stoves and hydronic heaters. Some small forced-air furnaces have already transferred technology from wood heaters to achieve good performance. Several industry comments questioned their ability to transfer technology from hydronic heaters because of their concerns about size limitations in order to install forced-air furnaces indoors going through doorways and other entrances to basements. They were especially concerned that the space limitations may affect their ability to adequately insulate the models that may be installed in close proximity to combustibles. We acknowledge their concerns but note that coal, oil and natural gas forced-air furnaces and indoor hydronic heaters that have similar space limitations and proximity to combustibles conditions have successfully handled those concerns for many years. For example, numerous

cord-wood-fired indoor hydronic heaters have been safely installed without large volumes of thermal insulation around the firebox

C. Appliance Certification

Many comments stressed the importance of easy public availability of certification test reports (especially electronically), limited CBI claims, more details on the EPA Web sites, better labels and more outreach to encourage change outs to cleaner stoves. We agree with these comments and the final rule incorporates this transparency and consumer-friendliness. Some comments suggested wording clarifications that we have incorporated in the final rule. More details are in the RTC document included in the docket for this rule.

D. Laboratory Accreditation, Third-Party Certification and Administrative Approval Process

Many comments stressed the importance of credible data for the certifications and the value of close EPA oversight, notwithstanding the addition of ISO-accredited laboratories and ISO-accredited certifying entities. Some comments suggested that the EPA should allow the ISO-accredited certifying entities to issue NSPS certificates directly and that the EPA's role should be solely to review the certifications and only question their certificates upon cause. The small business laboratories requested more time for the transition to ISO-accreditation because of the cost. As discussed earlier in this preamble, the final rule allows a 3-year extension of current EPA accreditations of laboratories and allows 6 months for ISO accreditation of certifying entities, except for hydronic heaters, which have used ISO-accredited certifying entities since October 2008 for the EPA voluntary program. The EPA will retain its approval and oversight functions for this final rule. As also discussed earlier in this preamble, to address the possibility that there may not be sufficient third-party certifier capacity and review and approval capacity by the EPA, especially in the first year, and so as to avoid unfairly restricting the production and sales of manufacturers who do all the things they should do and then potentially have to wait on the EPA approval, we have added a conditional, temporary approval by the EPA for room heaters subject to revised subpart AAA, as well as forced-air furnaces subject to subpart QQQQ, based on the manufacturer's submittal of a complete certification application. The application must include the full test report by an EPA-accredited laboratory and all required compliance statements by the manufacturer. The conditional approval would allow manufacture and sales for 1 year or until EPA review of the application, whichever is earlier. Within 1 year, the manufacturer must submit a certificate of conformity by a third-party certifier.

The 1-year conditional, temporary approval by the EPA does not apply to hydronic heaters because they have used third-party certifications for the voluntary program since 2008 and will continue to do so under the NSPS.

E. Costs and Economic Impacts

1. Costs

Comments received on the proposed rule included information and opinions regarding the EPA wood heater cost estimates.[8] Comments ranged from criticism that the EPA overestimated costs to criticism that the EPA underestimated costs. The comments that provided data and/or analysis explaining why the commenter thought EPA had not accurately estimated the costs were most persuasive, and we have revised our cost estimates based on those detailed comments. Details of our responses to cost comments are in the RTC document and the technical cost memoranda in the docket for this final rule.

a. Room Heaters

For example, Washington State Department of Ecology stated that the proposal cost estimates were overestimates and that our estimates did not address input from Woodstock Soapstone Stoves, winner of the 2013 Wood Stove Decathlon, which estimates that the cost of new product development is approximately $200,000, and furthermore that the proposal cost estimates did not address the economies manufacturers realize when they develop functionally identical models from the originally certified model.[9] Some other commenters generally stated that EPA's breakdown of cost estimates faced by manufacturers is inaccurately low. We have considered all the comments and have revised our cost estimates based on comments that provided additional detailed cost data.

Prior to proposal, we heard various estimates of the costs to bring a wood heater from concept to completion, from $200,000 for a single model to $1,360,000 for a 4-firebox model line. For example, a *Hearth and Home* article estimated the total cost to bring a model from conception to market as $645,000 to $750,000 for steel stoves and over $1 million for cast-iron, enameled wood stoves. The authors indicated that costs would decrease for separate models in the same line by up to 25 percent. Based on this information, we estimated that a 4-model steel line would cost up to $328,125 per model to develop. These costs include marketing, design, developing first generation, second generation and prototype units; NSPS and safety testing, equipment tooling, etc.[10] Two other manufacturers also provided estimated development costs for a 4-box model line, and based on that information at proposal we estimated average costs to develop a new model line, including testing with both crib wood and cord wood and reporting and recordkeeping, of $356,250 for certified wood stoves and pellet stoves. We also estimated $356,250 for single burn rate stoves, forced-air furnaces and hydronic heaters.

The Hearth Patio and Barbecue Association (HPBA) provided detailed estimates of adjustable burn rate wood stoves and hydronic heater model development costs. According to HPBA, the proposal cost estimates are deficient because they do not reflect specific emission rates or emission performances. Their detailed wood stove cost estimates are located in Attachment 2 of the HPBA comments and were prepared by National Economic Research Associates (NERA) Economic Consulting (May 2014).[11] Appendix A of the document, Woodstove Cost Modeling (prepared by Ferguson, Andors & Company) contains the detailed cost estimates we reviewed and adapted for this analysis.[12]

The Ferguson analysis provides cost estimates for four categories of emission reductions based on the proposed emission levels, consisting of modifying 7.5 g/hr stoves to comply with a new 4.5 g/hr emission limit, modifying the 4.5 g/hr stoves to comply with new emission limits of 2.5 g/hr or 1.3 g/hr stoves, and

[8] Comments on the proposed NSPS are available electronically through *http://www.regulations.gov* by searching Docket ID EPA–HQ–OAR–2009–0734.

[9] Comment on the proposed rule to Docket EPA–HQ–OAR–2009–0734 from the Washington State Department of Ecology; available at *http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2009-0734-1397.*

[10] James E. Houck and Paul Tiegs. *There's a Freight Train Comin'. Hearth and Home.* December 2009.

[11] Comment on the proposed rule to Docket EPA–HQ–OAR–2009–0734 from the Hearth, Patio and Barbecue Association available at *http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2009-0734-1643.*

[12] Ferguson, Robert (Ferguson, Andors & Company), prepared for the Hearth, Patio & Barbecue Association. Proposed Wood Heater NSPS Incremental Cost Effectiveness Analyses, Appendix A: Woodstove Cost Modeling. May 2014. p.1.

modifying a 2.5 g/hr stove to a new emission limit of 1.3 g/hr. The resulting cost components consisted of capital costs per model (R&D, engineering labor, tooling, equipment integration, preliminary testing, and other costs to design and manufacture the modified wood stove model) and other fixed costs per model (certification testing and safety testing, roll-out of the modified products including store display models and burn programs, brochures, user manuals, training and product discounts). The mid-point capital costs presented by Ferguson range from $281,725 to $532,050 depending on the emission reduction range.[13]

As discussed earlier in section III.A, unlike the proposed rule, the final subpart AAA rule only contains a Step 1 PM emission limit of 4.5 g/hr and a Step 2 PM emission limit of 2.0 g/hr, with no alternative, three-step emission limits. The comments overwhelmingly indicated that the three-step emission limit approach was inferior not only environmentally but also economically because it would, in effect, require many small manufacturers to engage in two rounds of R&D rather than one in order to obtain the same eventual endpoint.

The Step 1 cost for 7.5 to 4.5 g/hr is a reasonable representation of model development costs for all models subject to subpart AAA, with some exceptions, described below. The Ferguson analysis shows that several of the cost components are identical across scenarios. The analysis claims, however, that other cost components vary according to the specified emission reduction scenario. These differences were not supported in the comments. For purposes of this analysis, we used the 7.5 to 4.5 g/hr scenario as a baseline case and modified it to reflect the deletion of cost categories that were inappropriate for the NSPS analyses, *e.g.,* costs for trips to industry trade shows that would occur for all products regardless of the NSPS.

We did accept the assumptions and logic related to evaluating the tooling cost difference between steel stoves and cast iron stoves, as both are commonly manufactured. Like Ferguson, we used an average of their tooling costs to reflect product differences, even though this may overestimate the number of cast iron stoves in the market place. While we recognize the range in capital cost estimates provided both prior to and after proposal of the draft standards leave room for additional cost scenarios, especially the much lower cost scenario for Woodstock Soapstone Stoves, the Ferguson costs represent the best documented cost ranges and cost categories available at this time.

For the final cost analysis, we used the mean wood stove costs. For our analyses, these model development costs represent feasible costs for adjustable burn rate stoves and pellet stoves. For single burn rate stoves, as we did at proposal, the analyses reflect that additional R&D may be required to bring these stoves to qualifying levels. Rather than doubling the total model development costs during the first 2 years as we did at proposal, the new costs for the R&D/Engineering cost portion of the total costs are doubled in the first 2 years, with ''normal'' model development proceeding thereafter.

Details of our responses to cost comments are in the RTC document and the technical and cost memoranda in the docket for this final rule.

b. Central Heaters

At proposal, our analyses reflected that hydronic heaters and forced-air furnaces would face the same model development costs as room heaters. Some commenters objected to this characterization, particularly based on the detailed hydronic heater cost estimates located in Attachment 3 of the HPBA comments as prepared by NERA Economic Consulting (May 2014).[14] Appendix A of that document, Hydronic Heater Cost Modeling (prepared by Ferguson, Andors & Company) contains the detailed cost estimates we reviewed and adapted for this analysis.

The HPBA costs for hydronic heaters were prepared with the same methodology and overall assumptions as they used in development of the wood heater costs. The Ferguson analysis provides cost estimates for four categories of hydronic heater emission reductions, based on the proposed emission levels consisting of modifying uncontrolled heaters to comply with a new 0.32 lb/mmBtu emission limit, modifying the 0.32 lb/mmBtu heaters to comply with new emission limits of 0.15 or 0.06 lb/mmBtu, and modifying a 0.15 lb/mmBtu heater to a new emission limit of 0.06 lb/mmBtu. The resulting cost components consisted of capital costs per model (R&D, engineering labor, tooling, equipment integration, preliminary testing, and other costs to design and manufacture the modified wood stove model) and other fixed costs per model (certification testing and safety testing, roll-out of the modified products including store display models and burn programs, brochures, user manuals, training and product discounts). The mid-point capital costs presented by Ferguson range from $1,743,750 to $2,162,300 depending on the emission reduction range.[15] We used these cost estimates in our analysis.

As discussed earlier in section III.A, unlike the proposed rule, the final rule contains a Step 1 PM emission limit of 0.32 lb/mmBtu and a Step 2 PM emission limit of 0.10 lb/mmBtu, with no alternative three-step PM emission limits. The comments overwhelmingly indicated that the three-step PM emission limit approach was inferior not only environmentally but also economically because it would, in effect, require many small manufacturers to engage in two rounds of R&D rather than one in order to obtain the same eventual endpoint.

The Step 1 PM emission limit cost for modifying uncontrolled heaters to comply with 0.32 lb/mmBtu is a reasonable representation of model development costs for all models subject to subpart QQQQ, with some exceptions, described below. The Ferguson analysis shows that several of the cost components are identical across scenarios. The analysis claims that other cost components vary according to the specified emission reduction scenario; however, no support was provided for these claims in the Ferguson analysis. For purposes of our analysis, we used the scenario of uncontrolled to 0.32 lb/mmBtu as a baseline case and modified it to reflect the deletion of cost categories that were inappropriate for the NSPS impact analyses, *e.g.,* costs for trips to industry trade shows that would occur for all products regardless of the NSPS.

For our final rule cost analysis, we used the mean hydronic heater costs estimated in Table 5–2 of the final RIA. These model development costs represent feasible costs for hydronic heaters. For forced-air furnaces, as we did at proposal, our analysis included the additional R&D that may be required to bring these heaters to qualifying levels. Rather than doubling total model development costs during the first 2 years as we did at proposal, for the final rule analysis the R&D/Engineering cost portion of the total costs are doubled in

[13] Ferguson, Robert (Ferguson, Andors & Company), prepared for the Hearth, Patio & Barbecue Association. Proposed Wood Heater NSPS Incremental Cost Effectiveness Analyses, Appendix A: Woodstove Cost Modeling. May 2014. pp. 4–5.

[14] Comment on the proposed rule to Docket EPA–HQ–OAR–2009–0734 from the HPBA available at *http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2009-0734-1643.*

[15] Ferguson, Robert (Ferguson, Andors & Company), prepared for HPBA. Proposed Wood Heater NSPS Incremental Cost Effectiveness Analyses, Appendix A: Hydronic Heater Cost Modeling. May 2014. p. 4.

the first 2 years, with ''normal'' model development proceeding thereafter.

Details of our responses to cost comments are in the RTC document and the technical and cost memoranda in the docket for this final rule.

2. Economic Impacts

As discussed in detail in the RIA and summarized in section D.1 above, we received numerous comments on the costs, and we have adjusted our cost estimates as appropriate. Since the economic impacts are based on the costs and other factors, we have adjusted the economic impacts accordingly. The details of the adjustments are in the RIA, and a summary is in sections IV.C and VI of this preamble.

F. Test Methods

1. Crib Wood vs. Cord Wood

We received a full range of comments on this issue, from complete support for the proposed cord wood testing requirements to complete opposition to requiring cord wood testing at this time. We considered all comments and focused on those that discussed the data in detail. As discussed earlier in section IV, based on the data and comments submitted, we have determined that it is premature to require a cord wood-based Step 2 PM emission limit at this time (except for forced-air furnaces for which CSA B415.1–10 already specifies cord wood as the test fuel). Rather, we are basing the Step 2 PM emission limit on crib wood testing and including an alternative compliance option to meet an emission limit based on cord wood testing, to encourage manufacturers to certify with cord wood as soon as possible to provide consumers with better information for their actual in-home-use performance. There are some manufacturers that already achieve the cord wood emission level and we expect that many more manufacturers will take this option and submit data that will inform development of a required cord wood certification test in a future rulemaking.

Based on the existence of a viable draft cord wood test method and the expectation at proposal that the ASTM test methods for cord wood would be complete soon after proposal and that significant testing of wood heaters re-tuned to perform well on cord wood would occur before promulgation of this final rule, the EPA proposed to require testing only with cord wood for compliance with Step 2 emissions limits. We still encourage manufacturers to design wood heaters that best represent actual in-home-use performance on cord wood. However, the ASTM cord wood test methods have not been completed and only limited testing using the draft methods has occurred. For the cord wood alternative compliance option, we will consider approval of requested test methods on a case-by-case basis. We believe the current draft ASTM test methods are sufficient to be used, upon request, for the cord wood alternative compliance option until better test methods can be developed. We will also be receptive to other alternative test method requests that are adequately demonstrated, ideally according to the EPA Method 301 validation procedures. (Note that forced-air furnaces are tested according to the cord wood test method already specified in CSA B415.1–10.

2. Compliance for Individual Burn Rates Versus Weighted Averages

We received a full range of comments on this issue, from complete support for the proposed Step 2 compliance for individual burn rates to using only the weighted averages similar to the 1988 NSPS. We considered all comments and focused on those that discussed the data in detail. As mentioned earlier in section IV, based on the data and comments submitted, we have determined that the final rule will require weighted averages for Step 2 in subpart AAA and individual burn rates for Step 2 in subpart QQQQ.

For subpart AAA Step 2 emission limits, we proposed to require certification compliance at the lowest burn rate (Category 1) and the maximum burn rate (Category 4) rather than the weighted average of the four burn rates, which was required in the 1988 rule. Many comments on the proposal and the data in the NODA strongly supported the proposed compliance determinations per individual burn rates. Many other comments strongly opposed the proposal. Considering all of the comments and focusing on the available test data, especially the EPA wood stove certification test data by burn rate that we included in the July 1, 2014 NODA, we are requiring certification calculations based on the weighted average of the four burn rates for subpart AAA. As discussed earlier in section V.A, the data show that for weighted averages, 18 percent of noncatalytic stoves (that represent over 80 percent of the market) achieve 2.0 g/hr. However, on an individual burn rate basis, only 6 percent (7 of 110 stoves) achieve 2.0 g/hr, a relatively small percentage of wood stoves manufactured today. This supports our decision that a Step 2 limit of 2.0 g/hr, based on a weighted average of the multiple burn rates, better represents BSER for wood stoves/heaters subject to revised subpart AAA, compared to a Step 2 limit based on individual burn rates.

For subpart QQQQ, the final rule retains the proposed Step 1 g/hr emission cap for all burn rates (for hydronic heaters) and the Step 2 requirement for lb/mmBtu compliance at each burn rate (for both hydronic heaters and forced-air furnaces) given concerns about the sometimes very large emissions at individual burn rates. The emission limits reflect the data available. For a more detailed discussion of these comments and responses, see the RTC document in the docket for this rule.

3. National Technology Transfer and Advancement Act (NTTAA)

We received a full range of comments on this issue, from complete support to adamant disagreement with our determinations under the NTTAA at proposal that some portions of some of the ASTM test methods were not applicable or impractical for this rule because they did not achieve the Agency's mission, goals and objectives. (The NTTAA directs agencies to use voluntary consensus standards whenever applicable methods are available unless they are impractical.) As discussed in the proposal preamble in section VI.I, the rule incorporates some voluntary consensus standards (VCS) by reference, including some ASTM methods and CSA B415.1–10. We could not use some ASTM test methods and other VCS because they were not applicable. That is, the inapplicable VCS did not fully achieve the intent of this rule or the primary mission of the Agency and many tribes, states and local agencies to protect human health and the environment.

Some comments claimed that the EPA cannot take portions of VCS but rather must only use the whole VCS. That position is inconsistent with the intent of the NTTAA goal for reducing duplication of effort. That is, using valuable portions of VCS helps reduce potential duplicative efforts.

Some comments suggested that because the EPA unofficial participants (the EPA employees who were not ASTM members but participated in some of the calls) in certain ASTM test method development efforts did not submit official negatives on the standard, that somehow that meant that the EPA approved all of the details of the draft ASTM test methods. The EPA participants often expressed that the draft test methods were not fully applicable to the needs of the EPA and states; but since the draft test methods

may meet some of the immediate needs of the industry participants, the EPA did not want to stop the ASTM efforts to develop improved drafts. Further, the NTTAA guidance explicitly states that Agency participation does not indicate Agency approval or endorsement.

4. Real World, Cold Starts, Cycling, Moisture, Heat Demand

Many comments indicated a critical need for test methods that reflect the ''real world'' with cord wood, cold starts, cycling, moisture, heat demand and shorter averaging periods.

We strongly agree, and we will consider alternative cord wood test method requests on a case-by-case basis until we are convinced that improved test methods have been sufficiently demonstrated that they can be relied upon for regulatory purposes. Additionally, we expect that within the next few years we will receive enough ''real world'' cord wood test data for the EPA to establish revised certification requirements based on those test data.

G. Health Effects and Benefits

A more detailed summary of the comments is in the RTC document in the docket.

1. Additional Health Outcomes

Several comments suggested that the EPA should expand its assessment of health benefits.

The RIA includes all possible health impacts related to exposure to wood combustion-related $PM_{2.5}$. Table 7–1 of the RIA on human health effects of ambient $PM_{2.5}$ has an extensive list of the above mentioned health endpoints that were considered and monetized, including exacerbation of asthma among children. However, several were assessed qualitatively due to time and resource limitations. Table 7–2 of the RIA shows the results of the assessed health incidence reductions and related benefits from reduced $PM_{2.5}$ exposure associated with the proposed option.

2. Additional Pollutants and Outcomes

Comments suggested that the EPA should expand its assessment to include benefits of reductions in CO and VOC and certain non- human health-related benefits including: environmental degradation; accelerated depreciation of capital; haze; contribution to anthropogenic climate change; and harm to pets and livestock.

The EPA understands that the benefits assessment in the RIA reflects only a subset of the benefits attributable to the health effects reductions associated with ambient fine particles. Limitations in data, time and resources prevented the EPA from quantifying the impacts to, or monetizing the benefits from, several important benefits categories, including benefits associated with the potential exposure to ozone formation due to VOC emissions as a precursor, VOC emissions as a $PM_{2.5}$ precursor, CO, as well as ecosystem effects, and visibility impairment due to the absence of air quality modeling data for these pollutants among others in this analysis. However, the EPA provided an extensive qualitative assessment of those benefits. The EPA realizes that the benefits presented are an underestimate of the overall benefits resulting from this rule and that these reductions will help with ozone and PM planning.

3. Additional Benefits of Reducing Greenhouse Gases

Comments suggested that we expand the benefits analyses to include the benefits of reducing greenhouse gases.

The EPA agrees that there will be added benefits from assessing impacts of emission reductions of carbon dioxide (CO_2), methane and black carbon. While we know that these emissions will be reduced along with the reductions of PM emission and the increases in efficiency of the affected heaters, we do not have robust emissions test data to make quantitative benefits analysis on climate change at this time.

One commenter referred to the interagency Social Cost of Carbon (SCC) estimates. The comment suggested that (1) EPA should use SCC to reflect the monetized CO_2 impacts of the proposed rule in the RIA; and (2) EPA should use the SCC estimates published in 2010 instead of the updated SCC estimates published in 2013 because the updated estimates have not been subject to public comment. The SCC represents the monetized net damages of incremental changes in the amount of CO_2 emissions in a given year. Given that CO_2 impacts of the proposed rule were not analyzed, the SCC estimates were not used in the RIA.

4. Uncertainty of ''Value per Statistical Life''

Commenters stated that the EPA's use of the Value per Statistical Life (VSL)—that is, the monetized value attributable to mortality reduction—is a source of uncertainty.

While the Agency is updating its guidance by incorporating the most up-to-date literature and recent recommendations from the Science Advisory Board Environmental Economics Advisory Committee (SAB–EEAC), it has determined that a single, peer-reviewed estimate applied consistently best reflects the SAB–EEAC advice until updated guidance is available. Therefore, the EPA, after consulting with the Office of Management and Budget (OMB), has decided to use the value established in the 2000 Guidelines for all the EPA actions until a revised estimate can be fully vetted.

The EPA will continue to look into approaches based on the best available science as appropriate. The EPA will continue to recommend the central estimate of $7.4 million ($2006), updated to the year of the analysis, be used in all benefits analyses that seek to quantify mortality risk reduction benefits regardless of the age, income, or other population characteristics of the affected population until revised guidance becomes available. This approach was vetted and endorsed by the Agency when the 2000 ''Guidelines for Preparing Economic Analyses'' were drafted. Although $7.4 million ($2006) remains EPA's default guidance for valuing mortality risk changes, the Agency has considered and presented others and may well consider the commenter recommendation in future assessments.

We agree that there is uncertainty. Recent analyses have estimated substantial increases in life expectancy and the number of life years gained due to improved $PM_{2.5}$ air quality. For example, Hubbell (2006) estimated that reducing exposure to $PM_{2.5}$ from air pollution regulations may result in an average gain of 15 years of life for those adults prematurely dying from $PM_{2.5}$ exposure. In contrast, Pope et al. (2009) estimated changes in average life expectancy at birth over a 20-year period, suggesting that reducing exposure to air pollution may increase average life expectancy at birth by approximately 7 months, which was 15 percent of the overall increase in life expectancy at birth from 1980 through 2000.

5. Uncertainty in the EPA Analyses Regarding the Constant Benefits-per-Ton Simplifying Assumption, Dose-Response Relationship, and Benefits Transfer Approach

Comments suggested that the relationship between pollution and human health is more complex than the EPA's simplifying assumptions and thus more uncertain.

The EPA's methods for quantifying health benefits of emission reductions are based on the best available peer-reviewed science and methods that have withstood scrutiny from the EPA's independent Science Advisory Board (SAB), the National Academy of

Sciences (NRC, 2002), and continuous interagency review.

The RIA references a peer-reviewed manuscript and technical support document (TSD) that each describe the methods EPA employed to quantify the per-ton benefit of reducing fine particle levels from various sources. The air quality modeling attributed fine particle levels to residential wood heaters, holding all other sectors constant—giving us greater confidence that we have correctly characterized the air quality and health impacts attributable to this sector.

With respect to the incidence of benefits among populations living in locations already attaining the primary NAAQS, the EPA acknowledges that primary NAAQS are set at a level deemed by the EPA Administrator to be protective of public health with an adequate margin of safety. At the same time, primary NAAQS are not set at a level of zero risk and there is no known threshold below which $PM_{2.5}$ does not cause adverse health effects. Thus, the EPA recognizes that reducing the emissions level in those areas could still have health benefits.

Additional detail of our responses is included in the final RIA.

VI. Summary of Environmental, Cost, Economic, and Non-Air Health and Energy Impacts

The EPA estimates the total annualized average nationwide costs associated with this rule would be $45.7 million ($2013) over the timeframe of 2015 through 2020. The economic impacts for industries affected by this rule over this same period, estimated as a percent of annual compliance cost to sales, range from 1.1 percent for manufacture of pellet stove models to 17.1 percent for manufacture of hydronic heater models. These impacts do not presume any pass-through of impacts to consumers. With pass-through to consumers, these impact estimates to manufacturers will decline proportionate to the degree of pass-through.

A. What are the air quality impacts?

In section IV of the preamble to the proposed rule, we described the procedure we used to determine the air quality impacts on the industries affected by this rule. Following proposal, we revised the standards for room heaters and central heaters based on public comments. Table 6 is a summary of the revised estimated annual average emissions reductions over years 2015 through 2020 resulting from implementing the final NSPS compared to baseline conditions (for the years analyzed in the final RIA). As in the proposal, we developed emission factors for each appliance type and then applied those emission factors to shipment data for each of the appliance types subject to the final NSPS.[16] We developed the emission factors using the EPA Residential Wood Combustion (RWC) emission estimation tool,[17] which is a Microsoft Access database that compiles nationwide RWC emissions using county-level, process-specific data and calculations. The compilation of such data is a large, important, continually improving effort by the EPA and the states to ensure that we and the states have access to the best information available. For the final rule, we used the updated version of the tool. The updated tool includes the results of a peer-reviewed emission testing study of hydronic heaters conducted by the EPA Office of Research and Development and the New York State Energy Research and Development Agency. (The study was added to the docket prior to proposal but the tool was not updated until after proposal.) The results of that study show much higher emissions for hydronic heaters at baseline than we estimated at proposal. We have used the updated emission factors because they are based on the best available scientific information. We summed the estimated nationwide number of appliances and the estimated total tons of wood burned for each of the relevant product categories in the inventory and then made some adjustments/assumptions to the baseline RWC inventory to reflect emission characteristics specific to new units. As described below, to avoid any potential for overstating baseline emissions, we went a step further and assumed that all new shipments will meet the current State of Washington Department of Ecology limits, which are approximately 40 percent less than the 1988 NSPS.

Single burn rate stoves are not included in the RWC database as separate identifiable units. For our analysis, we used the same baseline emission factor as freestanding non-certified wood stoves. We used the average tons burned per appliance factor as representative of these stoves as well.

After calculating a baseline average emission rate/appliance (or "emission inventory category"), we multiplied the total tons of wood burned for the appliance by the RWC emission factor (adjusted as appropriate) to calculate the total tons of $PM_{2.5}$ emissions. We divided this value by the number of appliances in the category to calculate the baseline average $PM_{2.5}$ emissions per individual appliance. The next step was to develop emission factors representing the final NSPS. The timing of the NSPS emission limits used in this analysis matches the phased-in compliance dates.

For the subpart AAA analysis, we used HPBA data from their 2010 analysis that indicated that at least 90 percent (130 out of 145 catalytic, non-catalytic and pellet stoves combined) already meet the Step 1 PM emission limit. Manufacturers are expected to focus on existing models that already meet the Washington State DOE limits in order to comply with the Step 1 PM emission limit. Furthermore, certification data [18] indicate that 26 percent of non-catalytic and catalytic stoves combined and 70 percent of pellet stoves already meet the Step 2 PM emission limit. For our analysis, we used 26 percent of adjustable burn rate stoves and 70 percent of pellet stoves for the percentages that can already meet the Step 2 PM emission limit without intensive R&D efforts. Although previously unregulated and a less developed technology than adjustable burn rate stoves, single burn rate stove designs have been undergoing R&D in anticipation of the proposed NSPS and cleaner designs are in progress.

For the subpart QQQQ analysis for hydronic heaters, we note that the Step 1 PM emission limit is the EPA "Phase 2" voluntary program lb/mmBtu weighted average emission limit is already met by 50 hydronic heater models built by U.S. manufacturers participating in the voluntary program. We also note that 19 additional qualification tests have been recently submitted to EPA and, if valid, all 19 will be added as Phase 2 qualified models and Step 1 NSPS certified models. The NSPS Step 2 PM emission limit is already met by 9 hydronic heater models built by U.S. manufacturers participating in the voluntary program, as well as over 100 European models per test method EN 303–05 and over 20 pellet boilers (U.S. and European) that have been qualified in the RHNY program. Data indicate that at least 18 percent of current hydronic heater model designs can meet the Step 2 emission limit without intensive R&D efforts.

[16] Memo to USEPA from EC/R, Inc. Estimated Emissions from Wood Heaters. January 2015.

[17] Emission factors are based on EPA's Residential Wood Combustion Tool version 4.1 with updates from the 2012 EPA report (Gullett et al. Environmental, Energy Market, and Health Characterization of Wood-Fired Hydronic Heater, Final Report, June 2012).

[18] Memo to USEPA from EC/R, Inc. Derivation of wood heater model percentages meeting Step 2 standards. November 2014.

For the subpart QQQQ analysis for forced-air furnaces, we note that the Step 1 PM emission limit is based on test data from certifications under the Canadian standard B415.1–10 (circa 2010) and conversations with industry regarding cleaner forced-air furnace models currently being tested in R&D. As discussed earlier in this preamble, forced-air furnace designs able to meet the Step 2 limit are based on technology transferred from hydronic heater designs and/or wood stove designs.

Next we used data in the Frost & Sullivan Market (F&S) report [19] on 2008 shipments by product category, and F&S revenue forecasts which incorporated the weak economy in years 2009 and 2010, to calculate the reduced number of shipments in years 2009 and 2010. Forced-air furnaces were outside the scope of the F&S report. Instead, we used manufacturer estimates of total industry sales in 2008 and applied the F&S market factors to estimate shipments through 2010. The F&S wood stove numbers included both certified and non-certified stoves, so we estimated numbers of non-certified stove shipments out of the total reported wood stove category (*i.e.,* 40,000 single burn rate stoves shipped in 2008). These shipments were deleted from the total wood stove category shipments. We expanded the 2008 single burn rate estimate using the F&S factors.

For years 2011 through 2029, estimated shipments are generally based on a forecasted revenue growth rate of 2.0 percent, in keeping with the average annual growth in real U.S. GDP predicted by the Conference Board.[20] Historically wood heater shipments have most closely corresponded to GDP, housing starts, and price of wood relative to natural gas. The overall trend in the projection is reasonable in the absence of additional specific shipment projections. We did not change the relative percentages of one type of residential wood heater versus other types of residential wood heaters over this time period. The only exceptions to the use of a 2.0 percent U.S. GDP-based growth rate are for years 2012 and 2018, in which we used industry estimates for hydronic heater and wood stove shipments, respectively. For year 2012, an HPBA consultant estimated there were 13,100 baseline hydronic heater sales.[21] For year 2018, the same HPBA consultant projected there to be 100,000 wood stove sales.[22] We adjusted our estimated shipment data accordingly.

Our cost effectiveness analysis (CE) is based on industry data that show that a given model design will often be sold for approximately 10 years before being redesigned (a 10-year ''model design lifespan'') and that each individual stove will be used for 20 years before it is replaced in a residence (a 20-year ''use/emitting appliance lifespan''). These time periods were used to best characterize the actual model design and use lifespans. For proposal, we used a 20-year model design lifespan because many models developed for the 1988 NSPS are still being sold (after 25 years), with many ''new'' models retaining the same internal working parts with merely exterior cosmetic changes. In response to comments on the proposed rule,[23] however, in which some industry representatives commented that a shorter model lifespan is more typical, and provided data for models for several manufacturers, we reduced the model design lifespan to 10 years for this analysis. Regarding the emitting lifespan of the appliance, most wood heaters in consumer homes emit for at least 20 years and often much longer. Therefore, our CE analysis tracks shipments through year 2029 (using a 10-year design life for a model meeting the Step 2 emission limit in year 2020) and emissions through year 2048 (using a 20-year emitting life for an appliance shipped in year 2029).

Table 6 is a summary of the average emissions reductions over years 2015 through 2020 resulting from implementing the NSPS compared to baseline conditions (for the years analyzed in the RIA).

TABLE 6—ESTIMATED ANNUAL AVERAGE (2015–2020) AIR QUALITY IMPACTS [24]

Appliance type	$PM_{2.5}$ (tons)			VOC (tons)			CO (tons)		
	Baseline	Revised NSPS	Emission reduction	Baseline	Revised NSPS	Emission reduction	Baseline	Revised NSPS	Emission reduction
Wood Heaters	422	388	34	601	554	47	6,048	5,528	520
Single Burn Rate Heaters	922	238	684	1,597	326	1,271	6,954	3,830	3,124
Pellet Heaters/Stoves	59	53	6	1	1	0	307	277	30
Furnace: Indoor, Cord Wood	6,984	2,944	4,040	7,355	3,101	4,254	39,285	16,561	22,724
Hydronic Heating Systems	3,844	338	3,506	4,048	356	3,692	21,623	1,902	19,721
Total	12,231	3,962	8,269	13,602	4,337	9,265	74,218	28,099	46,119

Note: This table only includes the emissions during the first year of the life of each wood heater. That is, this table does not include the emissions that continue for the duration of the lifetime of each appliance's use, typically greater than 20 years. The EPA acknowledges that this is an underestimate of the actual total emission impacts but this table is provided to allow comparisons on a first year basis.

Minor discrepancies are due to rounding.

[19] Market Research and Report on North American Residential Wood Heaters, Fireplaces, and Hearth Heating Products Market. Prepared by Frost & Sullivan. April 26, 2010. P. 31–32.

[20] Global Economic Outlook 2014, projections prepared by the Conference Board, May 2014 update; *http://www.conference-board.org/data/globaloutlook.cfm.*

[21] Cost-Effectiveness Analysis of Alternative Hydronic Heater New Source Performance Standards, prepared for the Hearth, Patio, and Barbecue Association by NERA Economic Consulting, May 2014. (Attachment 3 of HPBA's comment to the Docket EPA–HQ–OAR–2009–0734).

[22] Cost-Effectiveness Analysis of Alternative Woodstove New Source Performance Standards, prepared for the HPBA by NERA Economic Consulting, May 2014. (Attachment 2 of HPBA's comment to Docket EPA–HQ–OAR–2009–0734).

[23] Comments on the proposed NSPS are available electronically through *http://www.regulations.gov* by searching Docket IDs EPA–HQ–OAR–2009–0734.

B. What are the benefits?

Emission reductions associated with the requirements of this rule will generate substantial health benefits by reducing emissions of $PM_{2.5}$, HAPs, as well as criteria pollutants and their precursors, including CO and VOC. VOC are precursors to $PM_{2.5}$ and ozone. For this rule, we were only able to quantify the monetized health co-benefits associated with reduced exposure from directly emitted $PM_{2.5}$. Our benefits reflect the average of annual $PM_{2.5}$ emission reductions occurring between 2015 and 2020 (inclusive). We estimate the monetized $PM_{2.5}$-related health benefits of the residential wood heaters NSPS in the 2015–2020 timeframe to be $3.4 billion to $7.6 billion (2013 dollars) at a 3-percent discount rate and $3.1 billion to $6.9 billion (2013 dollars) at a 7-percent discount rate. (These estimates are greater than the estimates at proposal because the emission reduction estimates are greater, as discussed in section VI.A of this preamble and the RIA.) Using alternate relationships between $PM_{2.5}$ and premature mortality supplied by experts, higher and lower benefits estimates are plausible, but most of the expert-based estimates fall between these two estimates.[25] A summary of the emission reduction and monetized benefits estimates for this rule at discount rates of 3 percent and 7 percent is in Table 7 of this preamble.

TABLE 7—SUMMARY OF MONETIZED $PM_{2.5}$-RELATED HEALTH BENEFITS FOR PROPOSED RESIDENTIAL WOOD HEATERS NSPS IN 2015–2020 TIMEFRAME

[millions of 2013 dollars] [a b c]

Pollutant	Estimated emission reductions (tpy)	Total monetized benefits (3% discount rate)	Total monetized benefits (7% discount rate)
Directly emitted $PM_{2.5}$	8,269	$3,400 to $7,600	$3,100 to $6,900
$PM_{2.5}$ Precursors			
VOC	9,265		

[a] All estimates are for the 2015–2020 timeframe (inclusive) and are rounded to two significant figures so numbers may not sum across rows. The total monetized benefits reflect the human health benefits associated with reducing exposure to $PM_{2.5}$ through reductions of $PM_{2.5}$ precursors, such as NO_X, and directly emitted $PM_{2.5}$. It is important to note that the monetized benefits do not include reduced health effects from exposure to HAP, direct exposure to NO_2, exposure to ozone, VOC, ecosystem effects, effects from black carbon or visibility impairment.

[b] PM benefits are shown as a range from Krewski, *et al.* (2009) to Lepeule, *et al.* (2012).

[c] These models assume that all fine particles, regardless of their chemical composition, are equally potent in causing premature mortality because the scientific evidence is not yet sufficient to allow differentiation of effects estimates by particle type.

These benefit estimates represent the monetized human health benefits for populations exposed to less $PM_{2.5}$ from emission limits established to reduce air pollutants in order to meet this rule. Due to analytical limitations, it was not possible to conduct air quality modeling for this rule. Instead, we used a ''benefit-per-ton'' approach to estimate the benefits of this rulemaking. To create the benefit-per-ton estimates, this approach uses a model to convert emissions of $PM_{2.5}$ precursors into changes in ambient $PM_{2.5}$ levels and another model to estimate the changes in human health associated with that change in air quality, which are then divided by the emissions in specific sectors. These benefit-per-ton estimates were derived using the approach published in Fann, *et al.*, (2012),[26] but they have since been updated to reflect these studies and population data in the 2012 p.m. NAAQS RIA.[27] Specifically, we multiplied the benefit-per-ton estimates from the ''Residential Wood Heaters'' category by the corresponding emission reductions.[28] All national-average benefit-per-ton estimates reflect the geographic distribution of the modeled air quality. The air quality modeling may not reflect the local variability in population density, meteorology, exposure, baseline health incidence rates, or other local factors for any specific location. More information regarding the derivation of the benefit-per-ton estimates for this category is available in the technical support document, which is referenced in footnote 26 and is available in the docket.

These models assume that all fine particles, regardless of their chemical composition, are equally potent in causing premature mortality because the scientific evidence is not yet sufficient to allow differentiation of effects estimates by particle type. Even though we assume that all fine particles have equivalent health effects, the benefit-per-ton estimates vary between precursors depending on the location and magnitude of their impact on $PM_{2.5}$ levels, which drive population exposure.

It is important to note that the magnitude of the $PM_{2.5}$ benefits is largely driven by the concentration response function for premature mortality. We cite two key empirical studies, one based on the American Cancer Society cohort study[29] and the extended Six Cities cohort study.[30] In the RIA for this rule, which is available in the docket, we also include benefits estimates derived from expert judgments (Roman *et al.*, 2008) as a characterization of uncertainty

[24] Memo to USEPA from EC/R, Inc. Estimated Emissions from Wood Heaters. January 2015.

[25] Roman, *et al.*, 2008. ''Expert Judgment Assessment of the Mortality Impact of Changes in Ambient Fine Particulate Matter in the U.S.,'' Environ. Sci. Technol., 42, 7, 2268–2274.

[26] Fann, N., K.R. Baker, and C.M. Fulcher. 2012. ''Characterizing the $PM_{2.5}$-related health benefits of emission reductions for 17 industrial, area and mobile emission sectors across the U.S.'' Environment International 49 41–151.

[27] U.S. Environmental Protection Agency (U.S. EPA). *Regulatory Impact Analysis for the Final Revisions to the National Ambient Air Quality Standards for Particulate Matter.* EPA–452/R–12–003. Office of Air Quality Planning and Standards, Health and Environmental Impacts Division. December 2012. Available at *http://www.epa.gov/pm/2012/finalria.pdf.*

[28] U.S. Environmental Protection Agency. Technical support document: Estimating the benefit per ton of reducing $PM_{2.5}$ precursors from 17 sectors. Research Triangle Park, NC. January 2013.

[29] Krewski, C.A., III, R.T. Burnett, M.J. Thun, E.E. Calle, D. Krewski, K. Ito, and G.D. Thurston. 2002. ''Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution.'' *Journal of the American Medical Association* 287:1132–1141.

[30] Lepeule J, Laden F, Dockery D, Schwartz J 2012. ''Chronic Exposure to Fine Particles and Mortality: An Extended Follow-Up of the Harvard Six Cities Study from 1974 to 2009.'' *Environ Health Perspect.* Jul;120(7):965–70.

regarding the $PM_{2.5}$-mortality relationship.

Considering a substantial body of published scientific literature, reflecting thousands of epidemiology, toxicology, and clinical studies, the EPA's Integrated Science Assessment for Particulate Matter [31] documents the association between elevated $PM_{2.5}$ concentrations and adverse health effects, including increased premature mortality. This assessment, which was reviewed twice by the EPA's independent Clean Air Scientific Advisory Committee, concluded that the scientific literature consistently finds that a no-threshold model most adequately portrays the PM-mortality concentration-response relationship. Therefore, in this analysis, the EPA assumes that the health impact function for fine particles is without a threshold.

In general, we are more confident in the magnitude of the risks we estimate from simulated $PM_{2.5}$ concentrations that coincide with the bulk of the observed PM concentrations in the epidemiological studies that are used to estimate the benefits. Likewise, we are less confident in the risk we estimate from simulated $PM_{2.5}$ concentrations that fall below the bulk of the observed data in these studies. Concentration benchmark analyses [*e.g.,* lowest measured level (LML) or one standard deviation below the mean of the air quality data in the study] allow readers to determine the portion of population exposed to annual mean $PM_{2.5}$ levels at or above different concentrations, which provides some insight into the level of uncertainty in the estimated $PM_{2.5}$ mortality benefits. There are uncertainties inherent in identifying any particular point at which our confidence in reported associations becomes appreciably less, and the scientific evidence provides no clear dividing line. However, the EPA does not view these concentration benchmarks as a concentration threshold below which we would not quantify health benefits of air quality improvements.

For this analysis, policy-specific air quality data are not available. Thus, we are unable to estimate the percentage of premature mortality associated with this specific rule's emission reductions at each $PM_{2.5}$ level. As a surrogate measure of mortality impacts, we provide the percentage of the population exposed at each $PM_{2.5}$ level using the source apportionment modeling used to calculate the benefit-per-ton estimates for this sector. Using the Krewski, *et al.,* (2009) study, 93 percent of the population is exposed to annual mean $PM_{2.5}$ levels at or above the LML of 5.8 $\mu g/m^3$. Using the Lepeule, *et al.,* (2012) study, 67 percent of the population is exposed above the LML of 8 $\mu g/m^3$. It is important to note that baseline exposure is only one parameter in the health impact function, along with baseline incidence rates, population, and change in air quality. Therefore, caution is warranted when interpreting the LML assessment for this rule.

Every benefit analysis examining the potential effects of a change in environmental protection requirements is limited, to some extent, by data gaps, model capabilities (such as geographic coverage) and uncertainties in the underlying scientific and economic studies used to configure the benefit and cost models. Despite these uncertainties, the benefit analysis for this rule provides a reasonable indication of the expected health benefits of the rulemaking under a set of reasonable estimations.

One should note that the monetized benefits estimates provided above do not include benefits from several important benefit categories, including exposure to HAP, VOC and ozone exposure, as well as ecosystem effects, visibility impairment and greenhouse gas impacts. Although we do not have sufficient information or modeling available to provide monetized estimates for these benefits in this rule, we include a qualitative assessment of these unquantified benefits in the RIA [32] for this final rule.

For more information on the benefits analysis, please refer to the RIA for this rule, which is available in the docket.

C. What are the cost impacts?

In analyzing the potential cost impacts of the NSPS, we considered two types of impacts. The first was the impact to the manufacturer to comply with the proposed standards. The second was the increase in price of the affected unit. In both of these cases, we considered the same input variables: Research and development (R&D) cost to develop and certify complying model lines, certification costs (where these are separate from R&D), reporting and recordkeeping costs, numbers of shipments of each appliance category (modified, from Frost & Sullivan report), number of manufacturers, and number of models per manufacturer. This section of the preamble contains a summary of these costs. For more detailed information, see the manufacturer cost impact memo [33] and unit cost memo [34] in the docket. Unless otherwise specified, all costs are in 2013 dollars.

As discussed in detail in section IV.C, we reviewed information provided by HPBA and manufacturers. Based on this information, we estimated [35] average costs to develop a new model line. The estimates of the cost of R&D are crucial to our estimates of overall costs and economic impacts and greatly influence our decisions on BSER and implementation lead times. We annualized the R&D costs over 6 years, applied the NSPS implementation assumptions, and estimated the average manufacturing cost per model line per manufacturer.

The estimate of the number of model types was derived from information provided by HPBA, individual manufacturers, and Internet searches of product offerings. For numbers of manufacturers, we started with HPBA data and modified the dataset based on Internet searches of manufacturers of the major appliance types. Table 8 is a summary of the nationwide average annual NSPS-related cost increases to manufacturers. The average annual cost increases are presented over the 2015 to 2020 period consistent with the years analyzed in the RIA,[36] but were also analyzed over the 2015 to 2029 period. The 2015 to 2029 period encompasses the 2015 NSPS compliance year through the life span of models designed to meet the NSPS, as explained further below and in our background analyses.[37]

TABLE 8—SUMMARY OF NATIONWIDE AVERAGE ANNUAL COST INCREASES

[2013$]

Appliance type	2015–2020 Period
Wood Heaters	$3,020,000
Single Burn Rate Heaters	870,000
Pellet Heaters/Stoves	1,520,000
Forced-Air Furnaces	15,360,000

[31] U.S. Environmental Protection Agency (U.S. EPA). 2009. *Integrated Science Assessment for Particulate Matter (Final Report).* EPA–600–R–08–139F. National Center for Environmental Assessment—RTP Division. December. Available on the Internet at *http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=216546.*

[32] RIA for the Final Residential Wood Heaters NSPS.

[33] Memo to USEPA from EC/R, Inc. Residential Heater Manufacturer Cost Impacts. January 2015.

[34] Memo to USEPA from EC/R, Inc. Unit Cost Estimates of Residential Wood Heating Appliances. January 2015.

[35] In developing average R&D costs, we used the highest industry R&D estimates supplied for cost components we deemed attributable to the NSPS, in order to avoid under-estimating potential costs per model line. We also assumed no model consolidation to avoid understating the number of model lines that would undergo R&D nationwide.

[36] RIA for the Final Residential Wood Heaters NSPS.

[37] Memo to USEPA from EC/R, Inc. Residential Heater Cost Effectiveness Analysis. January 2015.

TABLE 8—SUMMARY OF NATIONWIDE AVERAGE ANNUAL COST INCREASES—Continued

[2013$]

Appliance type	2015–2020 Period
Hydronic Heating Systems	24,880,000
Total Average Annual Cost ...	45,660,000

To develop estimates of potential unit cost increases, we used major variables including the estimated number of units shipped per year, the costs to develop new models, baseline costs of models, and the schedule by which the revised NSPS would be implemented. Both the number of shipped units and the baseline costs of models (manufacturers' cost not retail price) were initially based on data from the Frost & Sullivan report with modifications to address additional appliances or subsets of appliances and industry comments as discussed in our background analyses.[38] We also estimated the potential additional manufacturing costs to make NSPS complying models. These expenses result from the use of more expensive structural materials, components to enhance good combustion, etc. We estimated the following additional manufacturing costs per unit based on appliance type:

- Certified wood stoves and pellet stoves represent a well-developed technology and we could not identify price differences between models with lower emission levels compared to models with higher emission levels. Some stoves with lower emission sell for less than some stoves with higher emissions and vice versa. Therefore, we have assumed no additional manufacturing costs.
- One manufacturer estimated that it will cost an average of $100 more to manufacture a lower emitting single burn rate product (exclusive of recovering R&D cost), which we updated to 2013 ($), approximately $110.[39]
- We have limited information that indicates the cost to produce a forced-air furnace that complies with a Step 1 emission limit is approximately 75 percent more, or $1,700 (exclusive of recovering R&D cost).[40]
- As can be seen in hydronic heater market survey results, the prices of qualified model hydronic heaters range from $6,995 to $15,395, with the average retail price of $10,193. We adjusted this value to exclude the 25 percent retail markup, resulting in a manufacturers' cost estimate of $8,154.[41] We estimated an approximate increase of $3,200 to manufacture a qualified unit compared to an unqualified unit.

Our next step was to develop the following incremental cost formula: Cost of amortized R&D multiplied by number of models divided by number of units shipped per year equals the incremental cost of developing a new unit, spread over the number of units expected to be sold during a given year in the 6-year model development period. In developing this calculation, we included the concept that the R&D costs per model line are recovered in the sales price of future models, which means that the more units that are sold, the lower the incremental cost per unit. For our unit cost analysis, we used a flat rate in shipments—that is, future shipments over the 6-year model development period would be equal to the shipments estimated in the first year of the 6-year model development period (2015). The flat rate was used because we had no basis for concluding that sales of a given model line would increase or decrease over time due to market competition with other wood heaters or non-wood heaters, changes in consumer demand, changes in the relative price for that model compared to other models or any other factors. Where there are additional manufacturing costs as discussed above, we added these to the unit cost number. Table 9 shows the change in cost to develop and manufacture a stove from baseline (before the NSPS revisions) to after the NSPS revisions are implemented. The economic impacts of these costs are discussed in section C, "*What are the economic impacts?*" More information on both the costs and economic impacts is available in the RIA.

TABLE 9—SUMMARY OF UNIT COSTS

[Appliance prices in 2013$]

Appliance type	Cost at baseline (2014)	Total cost during NSPS model development (2015–2020)	Incremental cost increase (to recover amortized costs)
Certified Wood Heaters	$1,259	$1,307	$48
Single Burn Rate Heaters	271	410	139
Pellet Heaters/Stoves	1,384	1,430	46
Forced-Air Furnaces	974	3,225	2,251
Hydronic Heating Systems	4,923	10,287	5,364

More information is available in the RIA.

D. What are the economic impacts?

The economic impacts of the rule are estimated using industry-level estimates of annualized compliance cost to value of shipments (receipts) for affected industries. In this case, cost-to-receipts ratios approximate the maximum price increase needed for a producer to fully recover the annualized compliance costs associated with a regulation. Essentially, the revenues to producers will likely fully cover the annualized compliance cost incurred by producers at this maximum price increase. Any price increase above the cost-to-receipts ratio provides revenues that exceed the compliance costs. These industry level cost-to-receipts ratios can be interpreted as an average impact on potentially affected firms in these industries. Cost-to-receipts ratios for the affected product types range from 1.1 percent for pellet heaters/stoves to up to 17.1 percent for hydronic heaters. More

[38] Memo to USEPA from EC/R, Inc. Unit Cost Estimates of Residential Wood Heating Appliances. January 2015.

[39] NSPS Review and Comments. Confidential Business Information. September 2010.

[40] Confidential Business Information.

[41] Cost-Effectiveness Analysis of Alternative Hydronic Heater New Source Performance Standards. Prepared by NERA Consulting for the Hearth, Patio and Barbecue Association. May 2014. p. 10.

information on how these impacts are estimated can be found in Chapters 5 and 6 of the RIA.

In estimating the net benefits of regulation, the appropriate cost measure is ''social costs.'' Social costs represent the welfare costs of the rule to society and fully represent the cost impacts regardless of whether they are ultimately borne by manufacturers or consumers. Social costs are best approximated by the compliance costs estimated for this rule. Thus, the annualized social costs are best estimated to be $45.7 million, based on the estimate of costs to manufacturers and assuming no cost pass-through to consumers. Several comments noted that these potential price increases can often be offset by the homeowner in one or two heating seasons by the reduced cost of fuel due to the increased heating efficiencies. More information on how these social costs are estimated can be found in Chapter 5 of the RIA.

E. What are the non-air quality health and energy impacts?

These NSPS are anticipated to have no impacts or only negligible impacts on water quality or quantity, waste disposal, radiation or noise. To the extent new NSPS models are more efficient, that would lead to reduced wood consumption, thereby saving timber and preserving woodlands and vegetation for aesthetics, erosion control, carbon sequestration, and ecological needs.

It is difficult to determine the precise energy impacts that might result from this rule. On the one hand, to the extent that the NSPS wood-fueled appliance is more efficient, energy outputs per mass of wood fuel consumed will rise. However, wood-fueled appliances compete with other biomass forms as well as more traditional oil, electricity, and natural gas. Robust data are not available for us to be able to determine the potential for consumers to choose other types of fuels and their associated appliances if the consumer costs of wood-fueled appliances increase and at what level that increase would drive consumer choice. Similarly, robust data are not available for us to determine the degree to which better information on the energy efficiency of the NSPS appliances will encourage consumers to choose new wood-fueled appliances over other new appliances.

VII. Statutory and Executive Order Reviews

A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

This action is an economically significant regulatory action that was submitted to the Office of Management and Budget (OMB) for review. Any changes made in response to OMB recommendations have been documented in the docket. The EPA prepared an analysis of the potential costs and benefits associated with this action. This analysis, ''Regulatory Impact Analysis (RIA) for Residential Wood Heaters NSPS Revision, Final Report'' (EPA–452/R–15–001), is available in the docket.

A summary of the monetized benefits and net benefits for the final rule at discount rates of 3 percent and 7 percent is in Table 1 of this preamble, and a more detailed discussion of the benefits is found in section IV.B of this preamble. For more information on the benefits analysis, please refer to the RIA for this rulemaking, which is available in the docket. For more information on the cost analysis, please refer to the RIA or cost memoranda prepared for this rulemaking, all of which is available in the docket.

B. Paperwork Reduction Act (PRA)

The information collection requirements in the rule have been submitted for approval to OMB under the PRA. The Information Collection Request (ICR) documents that the EPA prepared for each subpart have been assigned the EPA ICR number 1176.12 for subpart AAA and ICR number 2442.02 for subpart QQQQ. You can find a copy of the ICR documents in the docket for this rule, and they are briefly summarized here. The new information collection requirements are not enforceable until OMB approves them.

This final rule will require manufacturers of new residential wood heating devices to submit applications for certification of model lines, to submit results of emissions tests conducted to demonstrate that the model lines would comply with the emission limits and produce certified units according to a quality control plan approved by an independent certifying body. Manufacturers must submit a notification of the initial test and biennial reports that each certified model line remains unchanged. They must also maintain records of all certification data, maintain results of quality assurance program inspections and emissions test data, and seal and store the tested appliance.

Consistent with the current ICR for subpart AAA, we have included costs to manufacture and apply permanent labels on each applicable unit prior to sale. These labels provide important compliance information to enforcement officials and important information to consumers for purchasing appliances. The amended NSPS allows (voluntary) use of EPA temporary labels for the cleanest heaters in order to provide consumers the ability to select wood heaters that meet or exceed the Step 2 standards prior to the 2020 compliance date. This voluntary temporary label option ends upon the 2020 compliance date. Furthermore, the amended NSPS also allows (voluntary) use of temporary EPA labels to indicate wood heaters that meet Step 2 based on cord wood instead of crib wood, allowing consumers to select heaters better tuned to in-home performance. The cost of the voluntary temporary labels are not included because they are not required.

Test laboratories that want to conduct NSPS certification testing will need to apply for approval, conduct proficiency testing and report the results of all such testing. The approved laboratories must maintain records of all certification tests, proficiency tests and compliance audit test data.

The required notifications are used to inform the agency when a new model line is expected to be tested. The EPA and states may then observe the testing, if desired. Emissions test reports are needed as these are the agency's record of a model line's initial capability to comply with the emission limit, and serve as a record of the operating conditions under which compliance was achieved. All information submitted to the EPA for which a claim of confidentiality is made (*e.g.,* design drawings) will be safeguarded according to the EPA regulations set forth in 40 CFR 2.201 *et seq.,* Chapter 1, Part 2, Subpart B—Confidentiality of Business Information.

Adequate recordkeeping and reporting are necessary to ensure compliance with these standards as required by the CAA. The information collected from recordkeeping and reporting requirements is also used for prioritizing inspections and is of sufficient quality to be used as evidence in court. We have reviewed all the current requirements and have removed the portions of the recordkeeping that are not necessary.

The EPA considered how to minimize the potential ICR burdens and has incorporated several features that make a major paperwork reduction impact.

For example, the rule allows one representative heater to be tested for a model line rather than requiring every heater to be tested. The revised subpart AAA itself ''deems'' automatic EPA certification of heaters that have EPA certifications under the 1988 NSPS that show that they would meet the Step 1 emission limits until Step 2. That is, no additional certification is required until Step 2. Also, the new subpart QQQQ deems automatic EPA NSPS Step 1 certification for hydronic heaters with valid EPA Phase 2 qualifications under the EPA Hydronic Heater Partnership Agreement of October 12, 2011 or hydronic heaters or forced-air furnaces certified by the NYSDEC that show compliance with the Step 1 emission levels. That is, no additional certification is required until Step 2. Also, residential pellet hydronic heaters/boilers that have been qualified under the Renewable Heat New York (RHNY) program will be automatically deemed EPA certified to meet the NSPS Step 1 and no additional certification is required until Step 2 provided that they comply with the RHNY requirements for installation and operation with adequate thermal storage.

Respondents/affected entities: Manufacturers of new residential wood heaters and laboratories that conduct or plan to conduct wood heater certification tests.

Respondent's obligation to respond: Mandatory under section 111 of the CAA.

Estimated number of respondents: 72 respondents under subpart AAA (66 manufacturers and 6 testing laboratories); 41 respondents under subpart QQQQ (37 manufacturers and 4 testing laboratories).

Frequency of responses: once per model line, annually, biennially, variable and/or infrequent.

Total estimated burden: 2,947 labor hours (per year) under subpart AAA; 2,337 labor hours (per year) under subpart QQQQ. Burden is defined at 5 CFR 1320.3(b).

Total estimated cost: $1,716,990 (per year) under subpart AAA, includes $1,466,440 annualized capital and operation & maintenance costs; $3,383,100 (per year) under subpart QQQQ, includes $3,191,200 annualized capital and operation & maintenance costs.

An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control numbers for the EPA's regulations in 40 CFR are listed in 40 CFR part 9. When OMB approves this ICR, the agency will announce that approval in the **Federal Register** and publish a technical amendment to 40 CFR part 9 to display the OMB control number for the approved information collection activities contained in this final rule.

C. Regulatory Flexibility Act (RFA)

Pursuant to sections 603 and 609(b) of the RFA, the EPA prepared an initial regulatory flexibility analysis (IRFA) for the proposed rule and convened a Small Business Advocacy Review (SBAR) Panel to obtain advice and recommendations from small entity representatives that potentially would be subject to the rule's requirements. Summaries of the IRFA and Panel recommendations are presented in the proposed rule at 79 FR 6329.

As required by section 604 of the RFA, the EPA prepared a final regulatory flexibility analysis (FRFA) for this action. The FRFA addresses the issues raised by public comments on the IRFA for the proposed rule. The complete FRFA is available for review in the docket and is summarized here.

- Reason Why Action Is Being Considered. As discussed earlier in this preamble, this final rule was developed following CAA section 111(b)(1)(B) review of the existing residential wood heater NSPS, and because emissions from residential wood heaters can be a significant source of air pollution, and thus adverse health effects, in some areas.
- Statement of Objectives and Legal Basis of Rule. As discussed earlier in this preamble, the EPA is amending Standards of Performance for New Residential Wood Heaters and adding one new subpart, Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces. This final rule achieves several objectives, including applying updated emission limits that reflect BSER; improving coverage of the broad suite of residential wood heaters; improving the test methods; and streamlining the certification process. This final rule does not include any requirements on heaters solely fired by coal, gas or oil. This final rule does not establish new emissions limits for existing heaters. This rule was developed under the authority of CAA section 111.
- Response to Any Comments to the Proposed Rule Filed by the Chief Counsel for Advocacy of the SBA. The SBA's Chief Counsel for Advocacy did not file any comments to the proposed rule.
- Description and Estimate of the Number of Small Entities. As discussed earlier in this preamble, small entities that the EPA anticipates being affected by this rule will include almost all manufacturers of residential wood heaters. We estimate that roughly 250–300 U.S. companies manufacture residential wood heaters. Approximately 90 percent of these manufacturers meet the SBA small-entity definition of having fewer than 500 employees.
- Description of reporting, recordkeeping and other compliance requirements. The reporting and recordkeeping requirements are described in the section immediately above (B. *Paperwork Reduction Act*). As discussed there, the information collection requirements (ICR), including reporting and recordkeeping, in this rule have been submitted for approval to OMB under the *Paperwork Reduction Act,* 44 U.S.C. 3501 *et seq.* For subpart AAA, we estimated the potential annual burden averaged over the first 3 years of the ICR to be a total of 2,947 labor hours per year at a total labor cost of $250,551 per year and an average annual labor burden per response of 12 hours. For subpart QQQQ, we estimated 2,337 labor hours per year at a total labor cost of $191,904 per year and an average annual labor burden per response of 12 hours.
- Description of other compliance requirements. As described earlier in this preamble, this rule will apply updated emission limits that reflect the current best systems of emission reduction (BSER) and improve the coverage of the expanded variety of types of residential wood heaters. We estimate the NSPS's total annualized average nationwide costs will be $45.7 million (2013$) over the 2015 through 2020 period. The economic impacts for industries affected by this rule over this same period range from 1.1 percent for manufacture of pellet stove models to as much as 17.1 percent compliance cost-to-sales estimate for manufacture of hydronic heater models. These impacts do not presume any pass-through of impacts to consumers. With pass-through to consumers, these impact estimates to manufacturers will decline proportionate to the degree of pass-through. We estimate that small entities will have annualized costs of greater than 1 percent of their sales in all affected industries, and NAICS 442299 with receipts less than $10 million. Those establishments in NAICS 332510, 333414 and 423720 with cost-to-receipt ratios higher than 1 percent account for 90 percent of small entities affected in these industries. Establishments in NAICS 442299 with cost-to-receipt ratios higher than 1 percent account for

99 percent of small entities affected in these industries.

• Relevant federal rules that may overlap or conflict with this rule. There are no other relevant federal rules.

• Significant alternatives. The significant alternatives to this rule, especially those that might minimize potential impacts on small entities, are presented in the remainder of this section.

As required by section 609(b) of the RFA, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA), the EPA also convened a Small Business Advocacy Review Panel (Panel) to obtain advice and recommendations of representatives of the small entities that potentially would be subject to the rule's requirements. The following paragraphs describe the process, the type of small entity representatives, the outreach efforts and the Panel members.

Well before beginning the formal SBREFA process, the EPA actively engaged in outreach with HPBA, MHA and PFI and many of their member companies to discuss the rule under development and to provide these contacts with an early opportunity to ask questions and discuss their concerns.[42] The EPA provided each small business with general information on the SBREFA process and background information on the NSPS rulemaking process and current schedule.

Based on consultations with the SBA, and resulting from solicited self-nominations, we prepared a list of 30 potential Small Entity Representatives (SERs), from residential wood heating appliance manufacturers (wood heaters, pellet heaters/stoves, hydronic heaters, forced-air furnaces and masonry heaters), other wood-burning appliance manufacturers (fireplaces, cook stoves), equipment suppliers, chimney sweeps, test laboratories, masons and trade associations. Once the official pre-Panel process began and potential SERs were identified, the EPA held an outreach meeting with the potential SERs and invited representatives from the Office of Advocacy of the Small Business Administration (OA/SBA) and the Office of Information and Regulatory Affairs within the Office of Management and Budget (OIRA/OMB) on June 29, 2010, to solicit their feedback on the upcoming proposed rulemaking. Representatives from 26 of the 30 companies and organizations that we selected as potential SERs for this SBREFA process participated in the meeting (in person and by phone). At that meeting, the EPA solicited written comments from the potential SERs, which were later summarized and shared with the Panel as part of the convening document.

The SBAR Panel convened on August 4, 2010. The Panel consisted of representatives of the EPA, OA/SBA and OIRA/OMB. The Panel held a formal outreach meeting/teleconference with the SERs on August 25, 2010. To help the SERs prepare for this meeting, on August 11, 2010, the Panel sent a list of questions, preliminary cost information and other materials to each of the SERs via email. Additional materials were emailed to the SERs on August 19, 2010. The Panel provided the opportunity for questions and comment during the meeting on various aspects of the proposal being developed, including the expanded scope of the rule, changes to the current requirements under consideration, preliminary cost information and follow up from the June 29, 2010, meeting on the SERs' ideas for regulatory flexibility. During the August 25 meeting, SERs voiced general support for the planned proposed rule and shared specific concerns with the Panel members. As a result of this meeting, the EPA received many useful verbal comments, and the EPA received many helpful written comments by September 10, 2010.

Consistent with the RFA/SBREFA requirements, the Panel evaluated the assembled materials and small-entity comments on issues related to elements of the Interim Regulatory Flexibility Analysis. A copy of the Panel final full report is included in the docket for this rule. We have attempted to follow the Panel's recommendations to the degree we can while also ensuring that the options are practicable, enforceable, environmentally sound and consistent with the CAA. For those recommendations not adopted by the EPA, we included an explanation at proposal for why we rejected them.

Further information about the panel is provided in the FRFA and the SBREFA Panel final report that are included in the docket for this rule.

In addition, the EPA is preparing a Small Entity Compliance Guide to help small entities comply with this rule. Small entities can obtain of a copy of this guide at *http://www.epa.gov/rfa/compliance-guides.html* or *http://www2.epa.gov/residential-wood-heaters.* We expect the Small Entity Compliance Guide to be available by April 2015.

D. Unfunded Mandates Reform Act (UMRA)

This action does not contain any unfunded mandates of $100 million or more as described in UMRA, 2 U.S.C. 1531–1538, and does not significantly or uniquely affect small governments. This action imposes no enforceable duty on any state, local or tribal governments. The nationwide annualized average compliance cost of this rule for directly affected appliances is $45.7 million/yr in the 2015–2020 timeframe (2013$). Therefore, this final rule is not be subject to the requirements of sections 202 or 205 of the UMRA.

This final rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. The rule does not apply to such governments and will impose no obligations upon them.

E. Executive Order 13132: Federalism

This action does not have federalism implications. It will not have substantial direct effects 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.

The rule will not impose any requirements on state and local governments. Thus, Executive Order 13132 does not apply to this final rule. Although section 6 of Executive Order 13132 does not apply to this final action, the EPA did consult with representatives of state and local governments in developing this action. In the spirit of Executive Order 13132 and consistent with the EPA policy to promote communications between the EPA and state and local governments, the EPA solicited comment on the proposed rule from state and local officials. We have responded to their significant comments in this preamble and in the RTC document.

F. Executive Order 13175: Consultation and Coordination With Indian Tribal Governments

This action does not have tribal implications as specified in Executive Order 13175. This rule will not impose any requirements on tribal governments. Thus, Executive Order 13175 does not apply to this action.

Consistent with the EPA Policy on Consultation and Coordination with Indian Tribes, the EPA consulted with tribal officials during the development of this action. A summary of that consultation is provided here. During

[42] Also, as noted in the proposal preamble in the discussion of development of the proposed hydronic heater emission limits, the EPA worked with the hydronic heater industry in 2006 to develop a voluntary partnership program to encourage manufacture of cleaner models, *www.epa.gov/burnwise/participation.*

the development of the proposed rulemaking, the EPA conducted outreach with numerous tribal representatives to provide opportunities for input prior to development of the proposed rule. We provided information at the July 2010, National Tribal Forum/National Tribal Air Association (NTAA) meeting in Albuquerque, New Mexico, and the November 2010, EPA Region 10 Tribal Leaders Summit in Juneau, Alaska. We also presented information on this proposed rulemaking in the April 2010, issue of Tribal Air News and during the EPA/NTAA tribal workgroup conference calls (April 2010, July 2010, August 2010, and May 2013). Specifically, we received input from the EPA/NTAA tribal workgroup members on culturally relevant exclusions from the proposed standards. We agreed with their input, clarified that we do not intend to regulate ceremonial fires, and added a definition to the rule to exclude traditional Native American bake ovens.

On February 18, 2011, the EPA mailed letters to about 600 elected tribal leaders in the U.S. offering an opportunity for consultation on this proposal. We received requests from six tribes. These tribes agreed to discuss this proposal with us in a conference call held on March 22, 2011. The tribes were very supportive of this proposal and provided some helpful clarifications of definitions (*e.g.,* Native American bake ovens) that we have incorporated in this proposal. We continued to provide updates on the rule on the EPA/NTAA conference calls and to offer opportunities to tribal leaders for consultation. On January 30, 2014, and September 25, 2014, we presented updates for tribes at the monthly EPA/NTAA conference calls.

The air quality and public health benefits to be achieved by this rule will benefit tribes. The emissions occur in neighborhoods and affect people in their homes. To the extent that populations are particularly sensitive to asthma, this rule will help.

G. Executive Order 13045: Protection of Children From Environmental Health Risks and Safety Risks

This action is not subject to Executive Order 13045 because the EPA does not believe the environmental health risks or safety risks addressed by this action present a disproportionate risk to children. This action's health and risk assessments are contained in the RIA as well as the report ''Analysis of Exposure to Residential Wood Combustion Emissions for Different Socio-Economic Groups'' [43] which shows that on a nationwide basis, cancer risks due to residential wood smoke emissions among disadvantaged population groups generally are lower than the risks for the general population due to residential wood smoke emissions. One of the demographic variables examined for this report was that of people 18 years and younger. The full report is available in the docket.

This final rule is expected to reduce environmental impacts for everyone, including children. This action promulgates emissions limits at the levels based on BSER, as required by the CAA. Based on our analysis, we believe this rule will not have a disproportionate impact on children, and, in fact, will result in improvements to children's health. These emissions happen in neighborhoods and affect people in their homes. To the extent that children are particularly sensitive to asthma, this rule will help.

H. Executive Order 13211: Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use

This action is not a ''significant energy action'' because it is not likely to have a significant adverse effect on the supply, distribution or use of energy. Further, we have concluded that this rule is not likely to have any significant adverse energy effects. In general, we expect the NSPS to improve technology, including energy efficiency. Reducing emissions and increasing efficiency might increase the use of wood fuel, which would relieve pressure on traditional coal or petroleum based energy sources. However, as described in section VI.E, it is difficult to determine the precise energy impacts that might result from this rule. This is because wood-fueled appliances compete with other biomass forms as well as more traditional oil, electricity and natural gas. Robust data are not available to determine the potential conversion to other types of fuels and their associated appliances if the consumer costs of wood-fueled appliances increase and at what level that increase would drive consumer choice.

[43] ''Analysis of Exposure to Residential Wood Combustion Emissions for Different Socio-Economic Groups, Revised Draft Report.'' Prepared for Gil Wood, U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC. Prepared by EC/R Inc., EPA Contract No. EP–D–05–085, Work Assignment No. 4–3. April 22, 2010.

I. National Technology Transfer and Advancement Act (NTTAA) and 1 CFR Part 51

This action involves technical standards. The EPA has decided to use several VCS ASTM International test methods, in full or in part, including the following:

- E2515–11 ''Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel.'' This test method is applicable for the determination of particulate matter emissions from solid-fuel-burning appliances including woodstoves, pellet-burning appliances, factory-built fireplaces, masonry fireplaces, masonry heaters, indoor furnaces, and indoor and outdoor hydronic heaters within a laboratory environment;
- E2779–10 ''Standard Test Method for Determining Particulate Matter Emissions from Pellet Heaters.'' This test method covers the fueling and operating protocol for determining particulate matter emissions from fires in pellet or other granular or particulate biomass burning room heaters and fireplace inserts;
- E2780–10 ''Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters.'' This test method covers the fueling and operating protocol for determining particulate matter emissions from wood fires in wood-burning room heaters and fireplace inserts as well as determining heat output and efficiency; and
- E2618–13 ''Standard Test Method for Measurement of Particulate Matter Emissions and Heating Efficiency of Outdoor Solid Fuel-Fired Hydronic Heating Appliances.'' This test method applies to wood-fired or automatically fed biomass burning hydronic heating appliances. These appliances transfer heat to the indoor environment through circulation of a liquid heat exchange media such as water or a water-antifreeze mixture.

In addition, we determined that the VCS ASTM E871–82 (Reapproved 2013), ''Standard Test Method for Moisture Analysis of Particulate Wood Fuels'' is acceptable as an alternative to that portion of the EPA Methods 5H and 28. ASTM E871–82 (Reapproved 2013) covers the determination of total weight basis moisture in the analysis sample of particulate wood fuel. These VCS test methods are available for purchase from ASTM International, 100 Barr Harbor Drive, P.O. Box CB700, West Conshohocken, Pennsylvania 19428–2959, (800) 262–1373, *http://www.astm.org.* A hard copy of this material is also available for viewing in

the docket for this rule (Docket ID# EPA–HQ–OAR–2009–0734), the EPA Docket Center, Public Reading Room, EPA WJC West, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the EPA Docket Center is (202) 566–1742.

The EPA will also use, in part, the following test VCS CSA method available at the CSA Web site *http://shop.csa.ca/en/canada/fuel-burning-equipment/b4151-10/invt/27013322010/:CSA_B415.1-10* ''Performance Testing of Solid-fuel-burning Heating Appliances.'' This standard specifies requirements for performance testing of solid-fuel-burning heating appliances, including maximum emission rates. This standard also specifies a method for determining heat outputs, appliance efficiencies, emission levels and composition, and flue gas flow rates. A hard copy of this material is also available for viewing in the docket for this rule (Docket ID# EPA–HQ–OAR–2009–0734) at the EPA Docket Center located at the address and telephone numbers above.

Finally, we will use, in part, the following VCS test method, European National (EN) standard prepared by the European Union: EN 303–5 ''Heating boilers for solid fuels, hand and automatically stoked nominal heat output of up to 1025 MBtu—Terminology, requirements, testing, and marketing.'' This EN standard applies to heating boilers including safety devices up to a nominal heat output of 500 kilowatts, which are designed for the burning of solid fuels only and are operated according to the instructions of the boiler manufacturer. This EN standard material is available for purchase at *http://www.en-standard.eu/csn-en-303-5-heating-boilers-part-5-heating-boilers-for-solid-fuels-manually-and-automatically-stoked-nominal-heat-output-of-up-to-500-kw-terminology-requirements-testing-and-marking/?gclid=CMv3wrbFrsACFU4F7Aod3yoAcw.* A hard copy of this material is also available for viewing in the docket for this rule (Docket ID# EPA–HQ–OAR–2009–0734), at the EPA Docket Center located at the address and telephone numbers above. We believe that all the methods listed above have some positive aspects that can help stakeholders determine emissions under various operation conditions. For more details, please refer to section 6 of the RTC document.

The search identified five other VCS that were potentially applicable for this rule in lieu of the EPA reference methods. However, the EPA determined that the five candidate VCS would not be applicable and practical due to lack of equivalency, documentation, validation data and other important technical and policy considerations. The five VCS and other information and conclusion, including the search and review results, are in the docket for this rule. The EPA solicited comments on this aspect of the proposed rulemaking. Specifically, we invited the public to identify potentially applicable voluntary consensus standards and to explain why such standards, in whole or in part, should or should not be used in this regulation. The EPA's responses to the significant comments are presented in section V of this preamble and in section 6 of the RTC document.

J. Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations

The EPA believes the human health or environmental risk addressed by this action will not have potential disproportionately high and adverse human health or environmental effects on minority, low-income or indigenous populations because it does not affect the level of protection provided to human health or the environment. The results of this evaluation are contained in the report ''Analysis of Exposure to Residential Wood Combustion Emissions for Different Socio-Economic Groups'' which shows that on a nationwide basis, cancer risks due to residential wood smoke emissions among disadvantaged population groups generally are lower than the risks for the general population due to residential wood smoke emissions.[44] Rather, the rule increases the level of environmental protection for all affected populations without having any disproportionately high and adverse human health or environmental effects on any population, including any minority, low-income or indigenous population.

This rule establishes national standards that will reduce primarily PM emissions from new residential wood heaters and, thus, is expected to decrease the amount of these emissions to which all affected populations are exposed. These emissions happen in many neighborhoods nationwide, including in minority and low-income neighborhoods and affect people in their homes. To the extent that minority populations and low-income populations are more vulnerable, this rule will help.

K. Congressional Review Act (CRA)

This action is subject to the CRA, and the EPA will submit a rule report to each House of the Congress and to the Comptroller General of the United States. This action is a ''major rule'' as defined by 5 U.S.C. 804(2).

List of Subjects in 40 CFR Part 60

Environmental protection, Administrative practice and procedure, Air pollution control, Carbon monoxide, Hazardous substances, Incorporation by reference, Intergovernmental relations, Particulate matter, Reporting and recordkeeping requirements.

Dated: February 3, 2015.

Gina McCarthy,

Administrator.

For the reasons stated in the preamble, title 40, chapter I, of the Code of Federal Regulations is amended as set forth below.

PART 60—STANDARDS OF PERFORMANCE FOR NEW SOURCES

■ 1. The authority citation for part 60 continues to read as follows:

Authority: 42 U.S.C. 7401 *et seq.*

Subpart A—General Provisions

■ 2. Section 60.17 is amended by revising paragraph (a) and the introductory text to paragraph (g); and by adding paragraphs (g)(202) through (206), (s) and (t) to read as follows:

§ 60.17 Incorporations by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, the EPA must publish notice of change in the **Federal Register** and the material must be available to the public. All approved material is available for inspection at the EPA Docket Center, Public Reading Room, EPA WJC West, Room 3334, 1301 Constitution Ave. NW., Washington, DC, telephone number 202–566–1744, and is available from the sources listed below. It is also 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/*

[44] ''Analysis of Exposure to Residential Wood Combustion Emissions for Different Socio-Economic Groups, Revised Draft Report.'' Prepared for Gil Wood, U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC. Prepared by EC/R Inc., EPA Contract No. EP–D–05–085, Work Assignment No. 4–3. April 22, 2010.

code_of_federal_regulations/ibr_locations.html.

* * * * *

(g) The following material is available for purchase from ASTM International, 100 Barr Harbor Drive, P.O. Box CB700, West Conshohocken, Pennsylvania 19428–2959, (800) 262–1373, *http://www.astm.org.*

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(202) ASTM E871–82 (Reapproved 2013), Standard Test Method for Moisture Analysis of Particulate Wood Fuels, (Approved August 15, 2013), IBR approved for Appendix A–8: Method 28R.

(203) ASTM E2515–11, Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel, (Approved November 1, 2011), IBR approved for § 60.534 and § 60.5476.

(204) ASTM E2779–10, Standard Test Method for Determining Particulate Matter Emissions from Pellet Heaters, (Approved October 1, 2010), IBR approved for § 60.534.

(205) ASTM E2618–13 Standard Test Method for Measurement of Particulate Matter Emissions and Heating Efficiency of Outdoor Solid Fuel-Fired Hydronic Heating Appliances, (Approved September 1, 2013), IBR approved for § 60.5476.

(206) ASTM E2780–10, Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters, (Approved October 1, 2010), IBR approved for Appendix A: Method 28R.

* * * * *

(s) This material is available for purchase from the Canadian Standards Association (CSA), 5060 Spectrum Way, Suite 100, Mississauga, Ontario, Canada L4W 5N6, Telephone: 800–463–6727.

(1) CSA B415.1–10, Performance Testing of Solid-fuel-burning Heating Appliances, (March 2010), IBR approved for § 60.534 and § 60.5476. (The standard is also available at *http://shop.csa.ca/en/canada/fuel-burning-equipment/b4151-10/invt/27013322010*)

(2) [Reserved]

(t) This European National (EN) standards material is available for purchase at European Committee for Standardization, Management Centre, Avenue Marnix 17, B–1000 Brussels, Belgium, Telephone: + 32 2 550 08 11.

(1) DIN EN 303–5:2012E (EN 303–5), Heating boilers—Part 5: Heating boilers for solid fuels, manually and automatically stoked, nominal heat output of up to 500 kW—Terminology, requirements, testing and marking, (October 2012), IBR approved for § 60.5476. (The standard is also available at *http://www.en-standard.eu/csn-en-303–5-heating-boilers-part-5-heating-boilers-for-solid-fuels-manually-and-automatically-stoked-nominal-heat-output-of-up-to-500-kw-terminology-requirements-testing-and-marking/?gclid=CJXI2P_97MMCFdccgQodan8ATA*)

(2) [Reserved]

■ 3. Subpart AAA is revised to read as follows:

Subpart AAA—Standards of Performance for New Residential Wood Heaters

Sec.
60.530 Am I subject to this subpart?
60.531 What definitions must I know?
60.532 What standards and associated requirements must I meet and by when?
60.533 What compliance and certification requirements must I meet and by when?
60.534 What test methods and procedures must I use to determine compliance with the standards and requirements for certification?
60.535 What procedures must I use for EPA approval of a test laboratory or EPA approval of a third-party certifier?
60.536 What requirements must I meet for permanent labels, temporary labels (hangtags), and owner's manuals?
60.537 What records must I keep and what reports must I submit?
60.538 What activities are prohibited under this subpart?
60.539 What hearing and appeal procedures apply to me?
60.539a Who implements and enforces this subpart?
60.539b What parts of the General Provisions do not apply to me?

Subpart AAA—Standards of Performance for New Residential Wood Heaters

§ 60.530 Am I subject to this subpart?

(a) You are subject to this subpart if you manufacture, sell, offer for sale, import for sale, distribute, offer to distribute, introduce or deliver for introduction into commerce in the United States, or install or operate an affected wood heater specified in paragraphs (a)(1) or (a)(2) of this section, except as provided in paragraph (c) of this section.

(1) Each adjustable burn rate wood heater, single burn rate wood heater and pellet stove manufactured on or after July 1, 1988, with a current EPA certificate of compliance issued prior to May 15, 2015 according to the certification procedures in effect in this subpart at the time of certification is an affected wood heater.

(2) All other residential wood heaters as defined in § 60.531 manufactured or sold on or after May 15, 2015 are affected wood heaters, except as provided in paragraph (c) of this section.

(b) Each affected wood heater must comply with the provisions of this subpart unless exempted under paragraphs (b)(1) through (b)(6) of this section. These exemptions are determined by rule applicability and do not require EPA notification or public notice.

(1) Affected wood heaters manufactured in the United States for export are exempt from the applicable emission limits of § 60.532 and the requirements of § 60.533.

(2) Affected wood heaters used for research and development purposes that are never offered for sale or sold and that are not used for the purpose of providing heat are exempt from the applicable emission limits of § 60.532 and the requirements of § 60.533. No more than 50 wood heaters manufactured per model line can be exempted for this purpose.

(3) Appliances that do not burn wood or wood pellets (such as coal-only heaters that meet the definition in § 60.531 or corn-only pellet stoves) are exempt from the applicable emission limits of § 60.532 and the requirements of § 60.533 provided that all advertising and warranties exclude wood burning.

(4) Cook stoves as defined in § 60.531 are exempt from the applicable emission limits of § 60.532 and the requirements of § 60.533.

(5) Camp stoves as defined in § 60.531 are exempt from the applicable emission limits of § 60.532 and the requirements of § 60.533.

(6) Modification or reconstruction, as defined in § 60.14 and § 60.15 of subpart A of this part does not, by itself, make a wood heater an affected facility under this subpart.

(c) The following are not affected wood heaters and are not subject to this subpart:

(1) Residential hydronic heaters and residential forced-air furnaces subject to subpart QQQQ of this part.

(2) Residential masonry heaters that meet the definition in § 60.531.

(3) Appliances that are not residential heating devices (for example, manufactured or site-built masonry fireplaces).

(4) Traditional Native American bake ovens that meet the definition in § 60.531.

§ 60.531 What definitions must I know?

As used in this subpart, all terms not defined herein have the meaning given them in the Clean Air Act and subpart A of this part.

Adjustable burn rate wood heater means a wood heater that is equipped with or installed with a damper or other mechanism to allow the operator to vary

burn rate conditions, regardless of whether it is internal or external to the appliance. This definition does not distinguish between heaters that are free standing, built-in or fireplace inserts.

Approved test laboratory means a test laboratory that is approved for wood heater certification testing under § 60.535 or is an independent third-party test laboratory that is accredited under ISO–IEC Standard 17025 to perform testing using the test methods specified in § 60.534 by an accreditation body that is a full member signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement and approved by the EPA for conducting testing under this subpart.

Camp stove (sometimes also called cylinder stove or wall tent stove) means a portable stove equipped with a pipe or chimney exhaust capable of burning wood or coal intended for use in a tent or other temporary structure used for hunting, camping, fishing or other outdoor recreation. The primary purpose of the stove is to provide space heating, although cooking and heating water may be additional functions.

Catalytic combustor means a device coated with a noble metal used in a wood heater to lower the temperature required for combustion.

Chip wood fuel means wood chipped into small pieces that are uniform in size, shape, moisture, density and energy content.

Coal-only heater means an enclosed, coal-burning appliance capable of space heating or space heating and domestic water heating, which is marketed and warranted solely as a coal-only heater and has all of the following characteristics:

(1) An opening for emptying ash that is located near the bottom or the side of the appliance;

(2) A system that admits air primarily up and through the fuel bed;

(3) A grate or other similar device for shaking or disturbing the fuel bed or a power-driven or mechanical stoker;

(4) Installation instructions, owner's manual and marketing information that state that the use of wood in the stove, except for coal ignition purposes, is prohibited by law; and

(5) A safety listing as a coal-only heater, except for coal ignition purposes, under accepted American or Canadian safety codes, as documented by a permanent label from a nationally recognized certification body.

Commercial owner means any person who owns or controls a wood heater in the course of the business of the manufacture, importation, distribution (including shipping and storage), or sale of the wood heater.

Cook stove means a wood-fired appliance that is designed, marketed and warranted primarily for cooking food and that has the following characteristics:

(1) An oven, with volume of 0.028 cubic meters (1 cubic foot) or greater, and an oven rack;

(2) A device for measuring oven temperatures;

(3) A flame path that is routed around the oven;

(4) An ash pan;

(5) An ash clean-out door below the oven;

(6) The absence of a fan or heat channels to dissipate heat from the appliance;

(7) A cooking surface with an area measured in square inches or square feet that is at least 1.5 times greater than the volume of firebox measured in cubic inches or cubic feet. Example: A cook stove with a firebox of 2 cubic feet must have a cooking surface of at least 3 square feet;

(8) A portion of at least four sides of the oven (which may include the bottom and/or top) is exposed to the flame path during the heating cycle of the oven. A flue gas bypass may exist for temperature control.

Fireplace means a wood-burning appliance intended to be used primarily for aesthetic enjoyment and not as a space heater. An appliance is a fireplace if it is in a model line that satisfies the requirements in paragraphs (1), (2) or (3) of this definition.

(1) The model line includes a safety listing under recognized American or Canadian safety standards, as documented by a permanent label from a nationally recognized certification body affixed on each unit sold, and that said safety listing only allows operation of the fireplace with doors fully open. Operation with any required safety screen satisfies this requirement.

(2) The model line has a safety listing that allows operation with doors closed, has no user-operated controls other than flue or outside air dampers that can only be adjusted to either a fully closed or fully opened position, and the requirements in either paragraph (2)(i) or (2)(ii) of this definition are satisfied.

(i) Appliances are sold with tempered glass panel doors only (either as standard or optional equipment), or

(ii) The fire viewing area is equal to or greater than 500 square inches.

(3)(i) A model line that is clearly positioned in the marketplace as intended to be used primarily for aesthetic enjoyment and not as a room heater, as demonstrated by product literature (including owner's manuals), advertising targeted at the trade or public (including web-based promotional materials) or training materials is presumptively a fireplace model line.

(ii) The presumption in paragraph (3)(i) of this definition can be rebutted by test data from an EPA-approved test laboratory reviewed by an EPA-approved third-party certifier that were generated when operating the appliance with the door(s) closed, and that demonstrate an average stack gas carbon dioxide (CO_2) concentration over the duration of the test run equal to or less than 5.00 percent and a ratio of the average stack gas CO_2 to the average stack gas carbon monoxide (CO) equal to or greater than 15:1. The stack gas average CO_2 and CO concentrations for the test run shall be determined in accordance with the requirements in CSA B415.1–10 (IBR, see § 60.17), clause 6.3, using a sampling interval no greater than 1 minute. The average stack gas CO_2 and CO concentrations for purposes of this determination shall be the average of the stack gas concentrations from all sampling intervals over the full test run.

Manufactured means completed and ready for shipment (whether or not assembled or packaged) for purposes of determining the date of manufacture.

Manufacturer means any entity that constructs or imports into the United States a wood heater.

Model line means all wood heaters offered for sale by a single manufacturer that are similar in all material respects that would affect emissions as defined in this section.

Particulate matter (PM) means total particulate matter including coarse particulate (PM_{10}) and fine particulate ($PM_{2.5}$).

Pellet fuel means refined and densified fuel shaped into small pellets or briquettes that are uniform in size, shape, moisture, density and energy content.

Pellet stove (sometimes called pellet heater or pellet space heater) means an enclosed, pellet or chip fuel-burning device capable of and intended for residential space heating or space heating and domestic water heating. Pellet stoves include a fuel storage hopper or bin and a fuel feed system. Pellet stoves include, but are not limited to:

(1) Free-standing pellet stoves—pellet stoves that are installed on legs or on a pedestal or other supporting base. These stoves generally are safety listed under ASTM E1509, UL–1482, ULC S627 or ULC–ORD C1482.

(2) Pellet stove fireplace inserts—pellet stoves intended to be installed in masonry fireplace cavities or in other enclosures. These stoves generally are safety listed under ASTM E1509, UL–1482, ULC–S628 or ULC–ORD C1482.

(3) Built-in pellet stoves—pellet stoves intended to be recessed into the wall. These stoves generally are safety listed under ASTM E1509, UL–127, ULC–S610 or ULC–ORD C1482.

Representative affected wood heater means an individual wood heater that is similar in all material respects that would affect emissions to other wood heaters within the model line it represents.

Residential masonry heater means a factory-built or site-built wood-burning device in which the heat from intermittent fires burned rapidly in the firebox is stored in the refractory mass for slow release to building spaces. Masonry heaters are site-built (using local materials or a combination of local materials and manufactured components) or site-assembled (using factory-built components), solid fuel-burning heating appliances constructed mainly of refractory materials (*e.g.,* masonry materials or soapstone. They typically have an interior construction consisting of a firebox and heat exchange channels built from refractory components, through which flue gases are routed. ASTM E–1602 ''Standard Guide for Construction of Solid Fuel Burning Masonry Heaters'' provides design and construction information for the range of masonry heaters most commonly built in the United States. The site-assembled models are generally listed to UL–1482.

Sale means the transfer of ownership or control, except that a transfer of control of an affected wood heater for research and development purposes within the scope of § 60.530(b)(2) is not a sale.

Similar in all material respects that would affect emissions means that the construction materials, exhaust and inlet air systems and other design features are within the allowed tolerances for components identified in § 60.533(k)(2), (3) and (4).

Single burn rate wood heater means a wood heater that is not equipped with or installed with a burn control device to allow the operator to vary burn rate conditions. Burn rate control devices include stack dampers that control the outflow of flue gases from the heater to the chimney, whether built into the appliance, sold with it, or recommended for use with the heater by the manufacturer, retailer or installer; and air control slides, gates or any other type of mechanisms that control combustion air flow into the heater.

Sold at retail means the sale by a commercial owner of a wood heater to the ultimate purchaser/user or noncommercial purchaser.

Third-party certifier (sometimes called *third-party certifying body* or *product certifying body*) means an independent third party that is accredited under ISO–IEC Standards 17025 and 17065 to perform certifications, inspections and audits by an accreditation body that is a full member signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement and approved by the EPA for conducting certifications, inspections and audits under this subpart.

Traditional Native American bake oven means a wood or other solid fuel burning appliance that is designed primarily for use by Native Americans for food preparation, cooking, warming or for instructional, recreational, cultural or ceremonial purposes.

Unseasoned wood means wood with an average moisture content of 20 percent or more.

Valid certification test means a test that meets the following criteria:

(1) The Administrator was notified about the test in accordance with § 60.534(g);

(2) The test was conducted by an approved test laboratory as defined in this section;

(3) The test was conducted on a wood heater similar in all material respects that would affect emissions to other wood heaters of the model line that is to be certified; and

(4) The test was conducted in accordance with the test methods and procedures specified in § 60.534.

Wood heater means an enclosed, wood burning-appliance capable of and intended for residential space heating or space heating and domestic water heating. These devices include, but are not limited to, adjustable burn rate wood heaters, single burn rate wood heaters and pellet stoves. Wood heaters may or may not include air ducts to deliver some portion of the heat produced to areas other than the space where the wood heater is located. Wood heaters include, but are not limited to:

(1) Free-standing wood heaters—Wood heaters that are installed on legs, on a pedestal or suspended from the ceiling. These products generally are safety listed under UL–1482, UL–737 or ULC–S627.

(2) Fireplace insert wood heaters—Wood heaters intended to be installed in masonry fireplace cavities or in other enclosures. These appliances generally are safety listed under UL–1482, UL–737 or ULC–S628.

(3) Built-in wood heaters—Wood heaters that are intended to be recessed into the wall. These appliances generally are safety listed under UL–1482, UL–737, UL–127 or ULC–S610.

§ 60.532 What standards and associated requirements must I meet and by when?

(a) *2015 particulate matter emission standards.* Unless exempted under § 60.530(b), each affected wood heater manufactured, imported into the United States, and/or sold at retail on or after May 15, 2015 must be certified to not discharge into the atmosphere any gases that contain particulate matter in excess of a weighted average of 4.5 g/hr (0.010 lb/hr), except that a wood heater manufactured before May 15, 2015 may be imported into the United States and/or sold at retail on or before December 31, 2015. Compliance for all heaters must be determined by the test methods and procedures in § 60.534.

(b) *2020 particulate matter emission standards.* Unless exempted under § 60.530(b) or electing to use the cord wood alternative means of compliance option in paragraph (c) of the section, each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020 must not discharge into the atmosphere any gases that contain particulate matter in excess of a weighted average of 2.0 g/hr (0.0044 lb/hr). Compliance for all heaters must be determined by the test methods and procedures in § 60.534.

(c) *2020 cord wood alternative compliance option.* Each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020 must not discharge into the atmosphere any gases that contain particulate matter in excess of a weighted average of 2.5 g/hr (0.0055 lb/hr). Compliance must be determined by a cord wood test method approved by the Administrator and the procedures in § 60.534.

(d) *Chip wood fuel requirements.* Operators of wood heaters that are certified to burn chip wood fuels must only burn chip wood fuels that have been specified in the owner's manual. The chip wood fuel must meet the following minimum requirements:

(1) Moisture content: less than 35 percent;

(2) Inorganic fines: less than or equal to 1 percent;

(3) Chlorides: less than or equal to 300 parts per million by weight;

(4) Ash content: no more than 2 percent;

(5) No demolition or construction waste; and

(6) Trace metals: less than 100 mg/kg.

(e) *Pellet fuel requirements.* Operators of wood heaters that are certified to burn pellet fuels must only burn pellets that have been specified in the owner's manual and graded under a licensing agreement with a third-party organization approved by the EPA. The Pellet Fuels Institute, ENplus and CANplus are initially deemed to be approved third-party organizations for this purpose, and additional organizations may apply to the Administrator for approval. The pellet fuel must meet the following minimum requirements as assured through a quality assurance program licensed by a third-party organization approved by the EPA:

(1) Density: consistent hardness and energy content with a minimum density of 38 pounds/cubic foot;

(2) Dimensions: maximum length of 1.5 inches and diameter between 0.230 and 0.285 inches;

(3) Inorganic fines: less than or equal to 1 percent;

(4) Chlorides: less than or equal to 300 parts per million by weight;

(5) Ash content: no more than 2 percent;

(6) Contains no demolition or construction waste;

(7) Trace metals: less than 100 mg/kg; and

(8) None of the prohibited fuels in paragraph (f) of this section.

(f) *Prohibited fuel types.* No person is permitted to burn any of the following materials in an affected wood heater:

(1) Residential or commercial garbage;

(2) Lawn clippings or yard waste;

(3) Materials containing rubber, including tires;

(4) Materials containing plastic;

(5) Waste petroleum products, paints or paint thinners, or asphalt products;

(6) Materials containing asbestos;

(7) Construction or demolition debris;

(8) Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, sawdust, wax and similar substances for the purpose of starting a fire in an affected wood heater;

(9) Railroad ties, pressure-treated wood or pallets;

(10) Manure or animal remains;

(11) Salt water driftwood or other previously salt water saturated materials;

(12) Unseasoned wood;

(13) Any materials that are not included in the warranty and owner's manual for the subject wood heater; or

(14) Any materials that were not included in the certification tests for the subject wood heater.

(g) *Operation of affected wood heaters.* The user of an affected residential wood heater must operate the heater in a manner consistent with the owner's manual. The owner's manual must clearly specify that operation in a manner inconsistent with the owner's manual would void the warranty.

(h) *Temperature sensor requirement.* An affected wood heater equipped with a catalytic combustor must be equipped with a temperature sensor that can monitor combustor gas stream temperatures within or immediately downstream [within 2.54 centimeters (1 inch)] of the catalytic combustor surface.

§ 60.533 What compliance and certification requirements must I meet and by when?

(a) *Certification requirement.* Each affected wood heater must be certified to be in compliance with the applicable emission standards and other requirements of this subpart. For each model line manufactured or sold by a single entity (*e.g.,* company or manufacturer), compliance with applicable emission standards of § 60.532 must be determined based on testing of representative affected wood heaters within the model line. If one entity licenses a model line to another entity, each entity's model line must be certified. If an entity intends to change the name of the entity or the name of the model, the manufacturer must apply for a new certification 60 days before the intended name change.

(1) Except for model lines meeting the requirements of paragraph (h)(1) of this section, on or after May 15, 2015, the manufacturer must submit to the Administrator the information required in paragraph (b) of this section and follow either the certification process in paragraphs (c) through (e) of this section or the third-party certifier-based application process specified in paragraph (f) of this section.

(2) On or after May 16, 2016, the manufacturer must submit the information required in paragraph (b) of this section and follow the third-party certifier-based application process specified in paragraph (f) of this section.

(b) *Application for a certificate of compliance.* Any manufacturer of an affected wood heater must apply to the Administrator for a certificate of compliance for each model line. The application must be submitted to: *WoodHeaterReports@epa.gov.* The application must be signed by a responsible representative of the manufacturer or an authorized representative and must contain the following:

(1) The model name and design number. The model name and design number must clearly distinguish one model from another. The name and design number cannot include the EPA symbol or logo or name or derivatives such as "EPA."

(2) Engineering drawings and specifications of components that may affect emissions (including specifications for each component listed in paragraph (k)(2), (3) and (4) of this section). Manufacturers may use assembly or design drawings that have been prepared for other purposes, but must designate on the drawings the dimensions of each component listed in paragraph (k) of this section. Manufacturers must identify tolerances of components listed in paragraph (k)(2) of this section that are different from those specified in that paragraph, and show that such tolerances cannot reasonably be anticipated to cause wood heaters in the model line to exceed the applicable emission limits. The drawings must identify how the emission-critical parts, such as air tubes and catalyst, can be readily inspected and replaced.

(3) A statement whether the firebox or any firebox component (including the materials listed in paragraph (k)(3) of this section) will be composed of material different from the material used for the firebox or firebox component in the wood heater on which certification testing was performed, a description of any such differences and demonstration that any such differences may not reasonably be anticipated to adversely affect emissions or efficiency.

(4) Clear identification of any claimed confidential business information (CBI). Submit such information under separate cover to the EPA CBI Office; Attn: Residential Wood Heater Compliance Program Lead, 1200 Pennsylvania Ave. NW., Washington, DC 20004. Note that all emissions data, including all information necessary to determine emission rates in the format of the standard, cannot be claimed as CBI.

(5) All documentation pertaining to a valid certification test, including the complete test report and, for all test runs: Raw data sheets, laboratory technician notes, calculations and test results. Documentation must include the items specified in the applicable test methods. Documentation must include discussion of each test run and its appropriateness and validity, and must include detailed discussion of all anomalies, whether all burn rate categories were achieved, any data not used in the calculations and, for any test runs not completed, the data collected during the test run and the reason(s)

that the test run was not completed and why. The burn rate for the low burn rate category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer. The test report must include a summary table that clearly presents the individual and overall emission rates, efficiencies and heat outputs. Submit the test report and all associated required information, according to the procedures for electronic reporting specified in § 60.537(f).

(6) A copy of the warranties for the model line, which must include a statement that the warranties are void if the unit is used to burn materials for which the unit is not certified by the EPA and void if not operated according to the owner's manual.

(7) A statement that the manufacturer will conduct a quality assurance program for the model line that satisfies the requirements of paragraph (m) of this section.

(8) A statement describing how the tested unit was sealed by the laboratory after the completion of certification testing and asserting that such unit will be stored by the manufacturer in the sealed state until 5 years after the certification test.

(9) Statements that the wood heaters manufactured under this certificate will be—

(i) Similar in all material respects that would affect emissions as defined in § 60.531 to the wood heater submitted for certification testing, and

(ii) Labeled as prescribed in § 60.536.

(iii) Accompanied by an owner's manual that meets the requirements in § 60.536. In addition, a copy of the owner's manual must be submitted to the Administrator and be available to the public on the manufacturer's Web site.

(10) A statement that the manufacturer has entered into contracts with an approved laboratory and an approved third-party certifier that satisfy the requirements of paragraph (f) of this section.

(11) A statement that the approved laboratory and approved third-party certifier are allowed to submit information on behalf of the manufacturer, including any claimed to be CBI.

(12) A statement that the manufacturer will place a copy of the certification test report and summary on the manufacturer's Web site available to the public within 30 days after the Administrator issues a certificate of compliance.

(13) A statement of acknowledgment that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the Administrator.

(14) A statement acknowledging that it is unlawful to sell, distribute or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

(15) Contact information for the responsible representative of the manufacturer and all authorized representatives, including name, affiliation, physical address, telephone number and email address.

(c) *Administrator approval process.* (1) The Administrator may issue a certificate of compliance for a model line if the Administrator determines, based on all information submitted by the applicant and any other relevant information available, that:

(i) A valid certification test demonstrates that the representative affected wood heater complies with the applicable emission standards in § 60.532;

(ii) Any tolerances or materials for components listed in paragraph (k)(2) or (3) of this section that are different from those specified in those paragraphs may not reasonably be anticipated to cause wood heaters in the model line to exceed the applicable emission limits; and

(iii) The requirements of paragraph (b) of this section have been met.

(2) The Administrator will deny certification if the Administrator determines that the criteria in paragraph (c)(1) of this section have not been satisfied. Upon denying certification under this paragraph, the Administrator will give written notice to the manufacturer setting forth the basis for this determination.

(d) *Level of compliance certification.* The Administrator will issue the certificate of compliance for the most stringent particulate matter emission standard that the tested representative wood heater meets under § 60.532.

(e) *Conditional, temporary certificate of compliance.* A conditional, temporary certificate of compliance may be granted by the Administrator until May 16, 2016 based on the manufacturer's submittal of a complete certification application meeting all the requirements in § 60.533(b). The application must include the full test report by an EPA-approved laboratory and all required compliance statements by the manufacturer with the exception of a certificate of conformity by an EPA-approved third-party certifier. The conditional, temporary certificate of compliance would allow manufacture and sales of the affected wood heater model line until May 16, 2016 or until the Administrator completes the review of the application, whichever is earlier. By May 16, 2016, the manufacturer must submit a certificate of conformity by an EPA-approved third-party certifier.

(f) *Third-party certifier-based application process.* (1) Any manufacturer of an affected wood heater must apply to the Administrator for a certificate of compliance for each model line. The manufacturer must meet the following requirements:

(i) The manufacturer must contract with a third-party certifier for certification services. The contract must include regular (at least annual) unannounced audits under ISO–IEC Standard 17065 to ensure that the manufacturer's quality assurance plan is being implemented. The contract must also include a report for each audit under ISO–IEC Standard 17065 that fully documents the results of the audit. The contract must include authorization and requirement for the third-party certifier to submit all such reports to the Administrator and the manufacturer within 30 days of the audit. The audit report must identify deviations from the manufacturer's quality assurance plan and specify the corrective actions that need to be taken to address each identified deficiency.

(ii) The manufacturer must submit the materials specified in paragraph (b) of this section and a quality assurance plan that meets the requirements of paragraph (m) of this section to the third-party certifier. The quality assurance plan must ensure that units within a model line will be similar in all material respects that would affect emissions to the wood heater submitted for certification testing, and it must include design drawings for the model line.

(iii) The manufacturer must apply to the third-party certifier for a certification of conformity with the applicable requirements of this subpart for the model line.

(A) After testing by an approved test laboratory is complete, certification of conformity with the emission standards in § 60.532 must be performed by the manufacturer's contracted third-party certifier.

(B) The third-party certifier may certify conformity if the emission tests have been conducted per the appropriate guidelines; the test report is complete and accurate; the instrumentation used for the test was properly calibrated; the test report shows that the representative affected wood heater meets the applicable emission limits specified in § 60.532; the quality assurance plan is adequate to ensure that units within the model line

will be similar in all material respects that would affect emissions to the wood heater submitted for certification testing; and that the affected heaters would meet all applicable requirements of this subpart.

(iv) The manufacturer must then submit to the Administrator an application for a certificate of compliance that includes the certification of conformity, quality assurance plan, test report and all supporting documentation specified in paragraph (b) of this section.

(v) The submission also must include a statement signed by a responsible official of the manufacturer or authorized representative that the manufacturer has complied with and will continue to comply with all requirements of this subpart for certificate of compliance and that the manufacturer remains responsible for compliance regardless of any error by the test laboratory or third-party certifier.

(2) The Administrator will issue to the manufacturer a certificate of compliance for a model line if it is determined, based on all of the information submitted in the application for certification and any other relevant information, that:

(i) A valid certification of conformity has demonstrated that the representative affected wood heater complies with the applicable emission standards in § 60.532;

(ii) Any tolerances or materials for components listed in paragraph (k)(2) or (3) of this section that are different from those specified in those paragraphs may not be reasonably anticipated to cause wood heaters in the model line to exceed the applicable emission limits;

(iii) The requirements of paragraph (b) of this section have been met; and

(iv) A valid certificate of conformity for the model line has been prepared and submitted.

(3) The Administrator will deny certification if the Administrator determines that the criteria in paragraph (f)(2) of this section have not been satisfied. Upon denying certification under this paragraph, the Administrator will give written notice to the manufacturer setting forth the basis for the determination.

(g) *Waiver from submitting test results.* An applicant for certification may apply for a potential waiver of the requirement to submit the results of a certification test pursuant to paragraph (b)(5) of this section, if the wood heater meets either of the following conditions:

(1) The wood heaters of the model line are similar in all material respects that would affect emissions, as defined in § 60.531, to another model line that has already been issued a certificate of compliance. A manufacturer that seeks a waiver of certification testing must identify the model line that has been certified, and must submit a copy of an agreement with the owner of the design permitting the applicant to produce wood heaters of that design.

(2) The manufacturer has previously conducted a valid certification test to demonstrate that the wood heaters of the model line meet the applicable standard specified in § 60.532.

(h) *Certification period.* Unless revoked sooner by the Administrator, a certificate of compliance will be valid for the following periods as applicable:

(1) For a model line that was previously certified as meeting the 1990 Phase II emission standards under the 1988 NSPS, in effect prior to May 15, 2015, at an emission level equal to or less than the 2015 emission standards in § 60.532(a), the model line is deemed to have a certificate of compliance for the 2015 emission standards in § 60.532(a), which is valid until the effective date for the 2020 standards in § 60.532(b) (*i.e.,* until May 15, 2020).

(2) For a model line certified as meeting emission standards in § 60.532, a certificate of compliance will be valid for 5 years from the date of issuance or until a more stringent standard comes into effect, whichever is sooner.

(i) *Renewal of certification.* (1) The manufacturer must request renewal of a model line's certificate of compliance or recertify the model line every 5 years, or the manufacturer may choose to no longer manufacture or sell that model line after the expiration date. If the manufacturer chooses to no longer manufacture that model line, then the manufacturer must submit a statement to the Administrator to that effect.

(2) A manufacturer of an affected wood heater model line may apply to the Administrator for potential renewal of its certificate of compliance by submitting the material specified in paragraph (b) and following the procedures specified in paragraph (f) of this section, or by affirming in writing that the wood heaters in the model line continue to be similar in all material respects that would affect emissions to the representative wood heater submitted for testing on which the original certificate of compliance was based and requesting a potential waiver from certification testing. The application must include a copy of the review of the draft application and approval by the third-party certifier.

(3) If the Administrator grants a renewal of certification, the Administrator will give written notice to the manufacturer setting forth the basis for the determination and issue a certification renewal.

(4) If the Administrator denies the request for a renewal of certification, the Administrator will give written notice to the manufacturer setting forth the basis for the determination.

(5) If the Administrator denies the request for a renewal of certification, the manufacturer and retailer must not manufacture or sell the previously-certified wood heaters after the expiration date of the certificate of compliance.

(j) [Reserved]

(k) *Recertification.* (1) The manufacturer must recertify a model line whenever any change is made in the design submitted pursuant to paragraph (b)(2) of this section that affects or is presumed to affect the particulate matter emission rate for that model line. The manufacturer of an affected wood heater must apply to the Administrator for potential recertification by submitting the material specified in paragraph (b) and following the procedures specified in paragraph (f) of this section, or by affirming in writing that the change will not cause wood heaters in the model line to exceed applicable emission limits and requesting a potential waiver from certification testing. The application for recertification must be reviewed and approved by the contracted third-party certifier and a copy of the review and approval must be included. The Administrator may waive this requirement upon written request by the manufacturer, if the manufacturer presents adequate rationale and the Administrator determines that the change may not reasonably be anticipated to cause wood heaters in the model line to exceed the applicable emission limits. The granting of such a waiver does not relieve the manufacturer of any compliance obligations under this subpart.

(2) Any change in the design tolerances or actual dimensions of any of the following components (where such components are applicable) is presumed to affect particulate matter and carbon monoxide emissions and efficiency if that change exceeds ±0.64 cm (±¼ inch) for any linear dimension and ±5 percent for any cross-sectional area relating to air introduction systems and catalyst bypass gaps unless other dimensions and cross-sectional areas are previously approved by the Administrator under paragraph (c)(1)(ii) of this section:

(i) Firebox: Dimensions;

(ii) Air introduction systems: Cross-sectional area of restrictive air inlets and outlets, location and method of control;

(iii) Baffles: Dimensions and locations;

(iv) Refractory/insulation: Dimensions and location;

(v) Catalyst: Dimensions and location;

(vi) Catalyst bypass mechanism and catalyst bypass gap tolerances (when bypass mechanism is in closed position): Dimensions, cross-sectional area, and location;

(vii) Flue gas exit: Dimensions and location;

(viii) Door and catalyst bypass gaskets: Dimensions and fit;

(ix) Outer thermal shielding and thermal coverings: Dimensions and location;

(x) Fuel feed system: For wood heaters that are designed primarily to burn pellet fuel or wood chips and other wood heaters equipped with a fuel feed system, the fuel feed rate, auger motor design and power rating, and the angle of the auger to the firebox; and

(xi) Forced-air combustion system: For wood heaters so equipped, the location and horsepower of blower motors and the fan blade size.

(3) Any change in the materials used for the following components is presumed to affect particulate matter emissions and efficiency:

(i) Refractory/insulation; or

(ii) Door and catalyst bypass gaskets.

(4) A change in the make, model or composition of a catalyst is presumed to affect particulate matter and carbon monoxide emissions and efficiency, unless the change has been requested by the heater manufacturer and has been approved in advance by the Administrator, based on test data that demonstrate that the replacement catalyst is equivalent to or better than the original catalyst in terms of particulate matter emission reduction.

(l) *Criteria for revocation of certification.* (1) The Administrator may revoke certification if it is determined that the wood heaters being manufactured or sold in that model line do not comply with the requirements of this subpart. Such a determination will be based on all available evidence, including but not limited to:

(i) Test data from a retesting of the original unit on which the certification test was conducted or a unit that is similar in all material respects that would affect emissions;

(ii) A finding that the certification test was not valid. The finding will be based on problems or irregularities with the certification test or its documentation, but may be supplemented by other information;

(iii) A finding that the labeling of the wood heater model line, the owner's manual or the associated marketing information does not comply with the requirements of § 60.536;

(iv) Failure by the manufacturer to comply with reporting and recordkeeping requirements under § 60.537;

(v) Physical examination showing that a significant percentage (as defined in the quality assurance plan approved pursuant to paragraph (m) of this section, but no larger than 1 percent) of production units inspected is not similar in all material respects that would affect emissions to the representative affected wood heater submitted for certification testing;

(vi) Failure of the manufacturer to conduct a quality assurance program in conformity with paragraph (m) of this section; or

(vii) Failure of the approved laboratory to test the wood heater using the methods specified in § 60.534.

(2) Revocation of certification under this paragraph (l) will not take effect until the manufacturer concerned has been given written notice by the Administrator setting forth the basis for the proposed determination and an opportunity to request a hearing under § 60.539.

(m) *Quality assurance program.* On or after May 16, 2016, for each certified model line, the manufacturer must conduct a quality assurance program that satisfies the requirements of paragraphs (m)(1) through (5) of this section. The quality assurance program requirements of this paragraph (m) supersede the quality assurance plan requirements previously specified in § 60.533(o) that was in effect prior to May 15, 2015. The manufacturer of a model line with a compliance certification under paragraph (h)(1) of this section must conduct a quality assurance program that satisfies the requirements of this paragraph (m) by May 16, 2016.

(1) The manufacturer must prepare and operate according to a quality assurance plan for each certified model line that includes specific inspection and testing requirements for ensuring that all units within a model line are similar in all material respects that would affect emissions to the wood heater submitted for certification testing and meet the emissions standards in § 60.532.

(2) The quality assurance plan must be approved by the third-party certifier as part of the certification of conformity process specified in paragraph (f) of this section.

(3) The quality assurance plan must include regular (at least annual) unannounced audits by the third-party certifier under ISO–IEC Standard 17065 to ensure that the manufacturer's quality assurance plan is being implemented.

(4) The quality assurance plan must include a report for each audit under ISO–IEC Standard 17065 that fully documents the results of the audit. The third-party certifier must be authorized and required to submit all such reports to the Administrator and the manufacturer within 30 days of the audit. The audit report must identify deviations from the manufacturer's quality assurance plan and specify the corrective actions that need to be taken to address each identified deficiency.

(5) Within 30 days after receiving each audit report, the manufacturer must report to the third-party certifier and to the Administrator its corrective actions and responses to any deficiencies identified in the audit report. No such report is required if an audit report did not identify any deficiencies.

(n) *EPA compliance audit testing.* (1)(i) The Administrator may select by written notice wood heaters or model lines for compliance audit testing to determine compliance with the emission standards in § 60.532.

(ii) The Administrator will transmit a written notification of the selected wood heaters or model line(s) to the manufacturer, which will include the name and address of the laboratory selected to perform the audit test and the model name and serial number of the wood heater(s) or model line(s) selected to undergo audit testing.

(2)(i) The Administrator may test, or direct the manufacturer to have tested, a wood heater or a wood heater from the model line(s) selected under paragraph (n)(1)(i) of this section in a laboratory approved under § 60.535. The Administrator may select any approved test laboratory or federal laboratory for this audit testing.

(ii) The expense of the compliance audit test is the responsibility of the wood heater manufacturer.

(iii) The test must be conducted using the same test method used to obtain certification. If the certification test consisted of more than one particulate matter sampling test method, the Administrator may direct the manufacturer and test laboratory as to which of these methods to use for the purpose of audit testing. The Administrator will notify the manufacturer at least 30 days prior to any test under this paragraph, and allow the manufacturer and/or his authorized representatives to observe the test.

(3) *Revocation of certification.* (i) If emissions from a wood heater tested under paragraph (n)(2) of this section exceed the applicable emission standard by more than 50 percent using the same test method used to obtain certification, the Administrator will notify the manufacturer that certification for that model line is suspended effective 72 hours from the receipt of the notice, unless the suspension notice is withdrawn by the Administrator. The suspension will remain in effect until withdrawn by the Administrator, or the date 30 days from its effective date if a revocation notice under paragraph (n)(3)(ii) of this section is not issued within that period, or the date of final agency action on revocation, whichever occurs earliest.

(ii)(A) If emissions from a wood heater tested under paragraph (n)(2) of this section exceed the applicable emission limit, the Administrator will notify the manufacturer that certification is revoked for that model line.

(B) A revocation notice under paragraph (n)(3)(ii)(A) of this section will become final and effective 60 days after the date of written notification to the manufacturer, unless it is withdrawn, a hearing is requested under § 60.539(a)(2), or the deadline for requesting a hearing is extended.

(C) The Administrator may extend the deadline for requesting a hearing for up to 60 days for good cause.

(D) A manufacturer may extend the deadline for requesting a hearing for up to 6 months, by agreeing to a voluntary suspension of certification.

(iii) Any notification under paragraph (n)(3)(i) or (n)(3)(ii) of this section will include a copy of a preliminary test report from the approved test laboratory or federal test laboratory. The test laboratory must provide a preliminary test report to the Administrator within 14 days of the completion of testing, if a wood heater exceeds the applicable emission limit in § 60.532. The test laboratory must provide the Administrator and the manufacturer, within 30 days of the completion of testing, all documentation pertaining to the test, including the complete test report and raw data sheets, laboratory technician notes, and test results for all test runs.

(iv) Upon receiving notification of a test failure under paragraph (n)(3)(ii) of this section, the manufacturer may request that up to four additional wood heaters from the same model line be tested at the manufacturer's expense, at the test laboratory that performed the emissions test for the Administrator.

(v) Whether or not the manufacturer proceeds under paragraph (n)(3)(iv) of this section, the manufacturer may submit any relevant information to the Administrator, including any other test data generated pursuant to this subpart. The manufacturer must bear the expense of any additional testing.

(vi) The Administrator will withdraw any notice issued under paragraph (n)(3)(ii) of this section if tests under paragraph (n)(3)(iv) of this section show either—

(A) That exactly four additional wood heaters were tested for the manufacturer and all four met the applicable emission limits; or

(B) That exactly two additional wood heaters were tested for the manufacturer and each of them met the applicable emission limits and the average emissions of all three tested heaters (the original audit heater and the two additional heaters) met the applicable emission limits.

(vii) If the Administrator withdraws a notice pursuant to paragraph (n)(3)(vi) of this section, the Administrator will revise the certification values for the model line based on the test data and other relevant information. The manufacturer must then revise the model line's labels and marketing information accordingly.

(viii) The Administrator may withdraw any proposed revocation, if the Administrator finds that an audit test failure has been rebutted by information submitted by the manufacturer under paragraph (n)(3)(iv) of this section and/or (n)(3)(v) of this section or by any other relevant information available to the Administrator.

§ 60.534 What test methods and procedures must I use to determine compliance with the standards and requirements for certification?

Test methods and procedures specified in this section or in appendices of this part, except as provided under § 60.8(b), must be used to determine compliance with the standards and requirements for certification under §§ 60.532 and 60.533 and for reporting carbon monoxide emissions and efficiency as follows:

(a)(1) For affected wood heaters subject to the 2015 and 2020 particulate matter emission standards of §§ 60.532(a) and (b), the manufacturer must have an EPA-approved test laboratory conduct testing according to paragraphs (a)(1)(i) or (ii) of this section. The manufacturer or manufacturer's authorized representative must submit a summary and the full test reports with all supporting information, including detailed discussion of all anomalies, whether all burn rate categories were properly achieved, any data not used in the calculations and, for any test runs not completed, the data that were collected and the reason that the test run was not completed. The burn rate for the low burn rate category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer. The manufacturer has the option of submitting test results obtained pursuant to either paragraph (a)(1)(i) or (ii) of this section to the Administrator as specified under § 60.537 as part of a request for a certification of compliance.

(i) Conduct testing with crib wood using EPA Method 28R of Appendix A–8 of this part or an alternative crib wood test method approved by the Administrator or the ASTM E2779–10 (IBR, see § 60.17) pellet heater test method to establish the certification test conditions and the particulate matter emission values.

(ii) Conduct testing with cord wood using an alternative cord wood test method approved by the Administrator to establish the certification test conditions and the particulate matter emission values.

(2) For the 2020 cord wood alternative means of compliance option specified in § 60.532(c), the manufacturer must have an EPA-approved test laboratory conduct testing with cord wood using an alternative cord wood test method approved by the Administrator to establish the certification test conditions and the particulate matter emission values.

(b) [Reserved]

(c) For affected wood heaters subject to the 2015 and 2020 particulate matter emission standards specified in § 60.532(a), (b) and (c), particulate matter emission concentrations must be measured with ASTM E2515–11 (IBR, see § 60.17). Four-inch filters and Teflon membrane filters or Teflon-coated glass fiber filters may be used in ASTM E2515–11.

(d) For all tests conducted using ASTM E2515–11 (IBR, see § 60.17) pursuant to this section, the manufacturer and approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel trains. The manufacturer and approved test laboratory must report the test results for the first hour separately and also include them in the total particulate matter emissions per run.

(e) The manufacturer must have the approved test laboratory measure the

efficiency, heat output and carbon monoxide emissions of the tested wood heater using Canadian Standards Administration (CSA) Method B415.1–10 (IBR, see § 60.17), section 13.7.

(f) Douglas fir may be used in ASTM E2779–10, ASTM E2780–10 and CSA B415.1–10 (IBR, see § 60.17).

(g) The manufacturer of an affected wood heater model line must notify the Administrator of the date that certification testing is scheduled to begin by email to *WoodHeaterReports@epa.gov*. This notice must be received by the EPA at least 30 days before the start of testing. The notification of testing must include the manufacturer's name and physical and email addresses, the approved test laboratory's name and physical and email addresses, the third-party certifier name, the model name and number (or, if unavailable, some other way to distinguish between models), and the dates of testing. The laboratory may substitute certification testing of another affected wood heater on the original date in order to ensure regular laboratory testing operations.

(h) The approved test laboratory must allow the manufacturer, the manufacturer's approved third-party certifier, the EPA and delegated state regulatory agencies to observe certification testing. However, manufacturers must not involve themselves in the conduct of the test after the pretest burn has begun. Communications between the manufacturer and laboratory or third-party certifier personnel regarding operation of the wood heater must be limited to written communications transmitted prior to the first pretest burn of the certification test series. During certification tests, the manufacturer may communicate with laboratory personnel only in writing and only to notify them that the manufacturer has observed a deviation from proper test procedures. All communications must be included in the test documentation required to be submitted pursuant to § 60.533(b)(5) and must be consistent with instructions provided in the owner's manual required under § 60.536(g), except to the extent that they address details of the certification tests that would not be relevant to owners or regulators.

§ 60.535 What procedures must I use for EPA approval of a test laboratory or EPA approval of a third-party certifier?

(a) *Test laboratory approval.* (1) A laboratory must apply to the Administrator for approval to test under this rule by submitting documentation that the laboratory is accredited by a nationally recognized accrediting entity under ISO–IEC Standard 17025 to perform testing using the test methods specified under § 60.534. Laboratories accredited by EPA prior to May 15, 2015 may have until March 16, 2018 to submit documentation that they have accreditation under ISO–IEC Standard 17025 to perform testing using the test methods specified under § 60.534. ISO accreditation is required for all other laboratories performing testing beginning on November 16, 2015.

(2) As part of the application, the test laboratory must:

(i) Agree to participate biennially in an independently operated proficiency testing program with no direct ties to the participating laboratories;

(ii) Agree to allow the Administrator, regulatory agencies and third-party certifiers access to observe certification testing;

(iii) Agree to comply with calibration, reporting and recordkeeping requirements that affect testing laboratories; and

(iv) Agree to perform a compliance audit test at the manufacturer's expense at the testing cost normally charged to such manufacturer if the laboratory is selected by the Administrator to conduct the compliance audit test of the manufacturer's model line. The test laboratory must provide a preliminary audit test report to the Administrator within 14 days of the completion of testing, if the tested wood heater exceeds the applicable emission limit in § 60.532. The test laboratory must provide the Administrator and the manufacturer, within 30 days of the completion of audit testing, all documentation pertaining to the test, including the complete test report and raw data sheets, laboratory technician notes, and test results for all test runs.

(v) Have no conflict of interest and receive no financial benefit from the outcome of certification testing conducted pursuant to § 60.533.

(vi) Agree to not perform initial certification tests on any models manufactured by a manufacturer for which the laboratory has conducted research and development design services within the last 5 years.

(vii) Agree to seal any wood heater on which it performed certification tests, immediately upon completion or suspension of certification testing, by using a laboratory-specific seal.

(viii) Agree to immediately notify the Administrator of any suspended tests through email and in writing, giving the date suspended, the reason(s) why, and the projected date for restarting. The laboratory must submit the operation and test data obtained, even if the test is not completed.

(3) If the EPA approves the laboratory, the Administrator will provide the test laboratory with a certificate of approval for testing under this rule. If the EPA does not approve the laboratory, the Administrator will give written notice to the laboratory setting forth the basis for the determination.

(b) *Revocation of test laboratory approval.* (1) The Administrator may revoke the EPA laboratory approval if it is determined that the laboratory:

(i) Is no longer accredited by the accreditation body;

(ii) Does not follow required procedures or practices;

(iii) Has falsified data or otherwise misrepresented emission data;

(iv) Has failed to participate in a proficiency testing program, in accordance with its commitment under paragraph (a)(2)(i) of this section; or

(v) Has failed to seal a wood heater in accordance with paragraph (a)(2)(vii) of this section.

(2) Revocation of approval under this paragraph (b) will not take effect until the laboratory concerned has been given written notice by the Administrator setting forth the basis for the proposed determination and an opportunity for a hearing under § 60.539. However, if revocation is ultimately upheld, all tests conducted by the laboratory after written notice was given will, at the discretion of the Administrator, be declared invalid.

(c) *Period of test laboratory approval* (1) With the exception of laboratories meeting the provisions of paragraph (c)(2) of this section, and unless revoked sooner, a certificate of approval for testing under this rule is valid for 5 years from the date of issuance.

(2) Laboratories accredited by the EPA by May 15, 2015, under the provisions of § 60.535 as in effect prior to that date may continue to be EPA accredited and deemed EPA approved for testing under this subpart until May 15, 2018, at which time the EPA accreditation and approval ends unless the laboratory has obtained accreditation under § 60.535 as in effect on that date.

(d) *Third-party certifier approval.* (1) A third-party certifier may apply to the Administrator for approval to be an EPA-approved third-party certifier by submitting credentials demonstrating that it has been accredited by a nationally recognized accrediting entity to perform certifications and inspections under ISO–IEC Standard 17025, ISO–IEC Standard 17065 and ISO–IEC Standard 17020.

(2) As part of the application, the third-party certifier must:

(i) Agree to offer to contract with wood heater manufacturers to perform

third-party certification activities according to the requirements of this subpart;

(ii) Agree to periodically conduct audits as described in § 60.533(m) and the manufacturer's quality assurance program;

(iii) Agree to comply with reporting and recordkeeping requirements that affect approved wood heater testing laboratories and third-party certifiers;

(iv) Have no conflict of interest and receive no financial benefit from the outcome of certification testing conducted pursuant to § 60.533;

(v) Agree to make available to the Administrator supporting documentation for each wood heater certification and audit; and

(vi) Agree to not perform initial certification reviews on any models manufactured by a manufacturer for which the third-party certifier has conducted research and development design services within the last 5 years.

(3) If approved, the Administrator will provide the third-party certifier with a certificate of approval. The approval will expire 5 years after being issued unless renewed by the third-party certifier. If the EPA denies the approval, the Administrator will give written notice to the third-party certifier for the basis for the determination.

(e) *Revocation of third-party certifier approval.* (1) The Administrator will revoke a third-party certifier's EPA approval if it is determined that the certifier;

(i) Is no longer accredited by the accreditation body;

(ii) Does not follow required procedures or practices; or

(iii) Has falsified certification data or otherwise misrepresented emission data.

(2) Revocation of approval under this paragraph (e) will not take effect until the certifier concerned is given written notice by the Administrator setting forth the basis for the proposed determination and an opportunity for a hearing under § 60.539. However, if revocation is upheld, all certifications by the certifier after written notice was given will, at the discretion of the Administrator, be declared invalid.

§ 60.536 What requirements must I meet for permanent labels, temporary labels (hangtags) and owner's manuals?

(a) *General permanent label requirements.* (1) Each affected wood heater manufactured on or after the date the applicable standards come into effect as specified in § 60.532, must have a permanent label affixed to it that meets the requirements of this section.

(2) Except for wood heaters subject to § 60.530(b)(1) through (5), the permanent label must contain the following information:

(i) Month and year of manufacture of the individual unit;

(ii) Model name or number;

(iii) Certification test emission value, test method and standard met (*e.g.*, 2015, 2020 crib wood, or 2020 cord wood); and

(iv) Serial number.

(3) The permanent label must:

(i) Be affixed in a readily visible or readily accessible location in such a manner that it can be easily viewed before and after the appliance is installed (an easily-removable facade may be used for aesthetic purposes, however the bottom of a free-standing heater is not considered to be readily visible or readily accessible);

(ii) Be at least 8.9 cm long and 5.1 cm wide (3½ inches long and 2 inches wide);

(iii) Be made of a material expected to last the lifetime of the wood heater;

(iv) Present the required information in a manner so that it is likely to remain legible for the lifetime of the wood heater; and

(v) Be affixed in such a manner that it cannot be removed from the appliance without damage to the label.

(4) The permanent label may be combined with any other label, as long as the required information is displayed, the integrity of the permanent label is not compromised, and the permanent label meets the requirements in § 60.536(a)(3).

(5) Any label statement under paragraph (b) or (c) of this section constitutes a representation by the manufacturer as to any wood heater that bears it:

(i) That a certification of compliance was in effect at the time the wood heater left the possession of the manufacturer;

(ii) That the manufacturer was, at the time the label was affixed, conducting a quality assurance program in conformity with § 60.533(m); and

(iii) That all wood heaters individually tested for emissions by the manufacturer under its quality assurance program pursuant to § 60.533(m) met the applicable emissions limits.

(b) *Permanent label requirements for adjustable burn rate wood heaters and pellet stoves.* If an adjustable burn rate wood heater or pellet stove belongs to a model line certified under § 60.533, and no wood heater in the model line has been found to exceed the applicable emission limits or tolerances through quality assurance testing, one of the following statements, as appropriate, must appear on the permanent label:

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2015 particulate emission standards. Not approved for sale after May 15, 2020." or

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using crib wood." or

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards using cord wood."

(c) *Permanent label requirements for single burn rate wood heaters.* If the single burn rate wood heater belongs to a model line certified under § 60.533, and no heater in the model line has been found to exceed the applicable emission limits or tolerances through quality assurance testing, one of the following statements, as appropriate, must appear on the permanent label:

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2015 particulate emission standards for single burn rate heaters. Not approved for sale after May 15, 2020. This single burn rate wood heater is not approved for use with a flue damper." or

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with 2020 particulate emission standards for single burn rate heaters. This single burn rate wood heater is not approved for use with a flue damper."

(d) *Additional permanent label content.* The permanent label for all certified wood heaters must also contain the following statement:

"This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual."

(e) *Permanent label requirements for affected wood heaters with exemptions under § 60.530(b).* (1) If an affected wood heater is manufactured in the United States for export as provided in § 60.530(b)(1), the following statement must appear on the permanent label:

"U.S. ENVIRONMENTAL PROTECTION AGENCY Export stove. May not be sold or operated within the United States."

(2) If an affected wood heater is manufactured for use for research and development purposes as provided in § 60.530(b)(2), the following statement must appear on the permanent label:

"U.S. ENVIRONMENTAL PROTECTION AGENCY Not certified. Research

Stove. Not approved for sale or for operation other than for research.''

(3) If a wood heater is exclusively a non-wood-burning heater as provided § 60.530(b)(3), the following statement must appear on the permanent label:

''U.S. ENVIRONMENTAL PROTECTION AGENCY This heater is not certified for wood burning. Use of any wood fuel is a violation of federal regulations.''

(4) If an affected wood heater is a cook stove that meets the definition in § 60.531, the following statement must appear on the permanent label:

''U.S. ENVIRONMENTAL PROTECTION AGENCY This unit is not a certified residential wood heater. The primary use for this unit is for cooking or baking.''

(5) If an affected wood heater is a camp stove that meets the definition in § 60.531, the following statement must appear on the permanent label:

''U.S. ENVIRONMENTAL PROTECTION AGENCY This unit is not a certified residential wood heater. For portable and temporary use only.''

(f) *Temporary label (hangtag) voluntary option.* (1) Each model certified to meet the 2020 particulate matter emission standards of § 60.532(b) prior May 15, 2020 may display the temporary labels (hangtags) specified in section 3 of Appendix I of this part. The electronic template will be provided by the Administrator upon approval of the certification.

(2) The hangtags in paragraph (f)(1) of this section end on May 15, 2020.

(3) Each model certified to meet the 2020 Cord Wood Alternative Compliance Option of § 60.532(c) may display the cord wood temporary label specified in section 3 of Appendix I of this part. The electronic template will be provided by the Administrator upon approval of the certification.

(g) *Owner's manual requirements.* (1) Each affected wood heater offered for sale by a commercial owner must be accompanied by an owner's manual that must contain the information listed in paragraph (g)(2) of this section (pertaining to installation) and paragraph (g)(3) of this section (pertaining to operation and maintenance). Such information must be adequate to enable consumers to achieve optimal emissions performance. Such information must be consistent with the operating instructions provided by the manufacturer to the approved test laboratory for operating the wood heater during certification testing, except for details of the certification test that would not be relevant to the user. The commercial owner must also make current and historical owner's manuals available on the company Web site and upon request to the EPA.

(2) Guidance on proper installation, include stack height, location and achieving proper draft.

(3) Proper operation and maintenance information, including minimizing visible emissions:

(i) Fuel loading and re-loading procedures; recommendations on fuel selection and warnings on what fuels not to use, such as unseasoned wood, treated wood, colored paper, cardboard, solvents, trash and garbage;

(ii) Fire starting procedures;

(iii) Proper use of air controls, including how to establish good combustion and how to ensure good combustion at the lowest burn rate for which the heater is warranted;

(iv) Ash removal procedures;

(v) Instructions for replacement of gaskets, air tubes and other parts that are critical to the emissions performance of the unit, and other maintenance and repair instructions;

(vi) For catalytic or hybrid models, information on the following pertaining to the catalytic combustor: Procedures for achieving and maintaining catalyst activity, maintenance procedures, procedures for determining deterioration or failure, procedures for replacement and information on how to exercise warranty rights;

(vii) For catalytic or hybrid models, the following statement—

''This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed.''

(viii) For noncatalytic models, the following statement—

''This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.''

(4) Any manufacturer using the EPA-recommended language contained in Appendix I of this part to satisfy any requirement of this paragraph (g) will be considered to be in compliance with that requirement, provided that the particular language is printed in full, with only such changes as are necessary to ensure accuracy for the particular wood heater model line.

(h) Wood heaters that are affected by this subpart, but that have been owned and operated by a noncommercial owner, are not subject to paragraphs (f) and (g) of this section when offered for resale.

§ 60.537 What records must I keep and what reports must I submit?

(a)(1) Each manufacturer who holds a certificate of compliance pursuant to § 60.533(c), (e) or (f) for a model line must maintain records containing the information required by paragraph (a)(2) through (4) of this section with respect to that model line for at least 5 years.

(2) All documentation pertaining to the certification test used to obtain certification, including the full test report and raw data sheets, laboratory technician notes, calculations, the test results for all test runs, and discussions of the appropriateness and validity of all test runs, including runs attempted but not completed. The retained certification test documentation must include, as applicable, detailed discussion of all anomalies, whether all burn rate categories were properly achieved, any data not used in the calculations and, for any test runs not completed, the data that were collected and the reason that the test run was not completed. The retained certification test also must include documentation that the burn rate for the low burn rate category was no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer.

(3) Results of the quality assurance program inspections pursuant to § 60.533(m).

(4) For emissions tests conducted pursuant to the quality assurance program required by § 60.533(m), all test reports, data sheets, laboratory technician notes, calculations, and test results for all test runs, the corrective actions taken, if any, and any follow-up actions such as additional testing.

(b) Each approved test laboratory and third-party certifier must maintain records consisting of all documentation pertaining to each certification test, quality assurance program inspection and audit test, including the full test report and raw data sheets, technician notes, calculations, and the test results for all test runs. Each approved test laboratory must submit accreditation credentials and all proficiency test results to the Administrator. Each third-party certifier must submit each certification test, quality assurance program inspection report and ISO IEC accreditation credentials to the Administrator.

(c) Each manufacturer must retain each wood heater upon which certification tests were performed based

upon which certification was granted under § 60.533(c) or (f) at the manufacturer's facility for a minimum of 5 years after the certification test. Each wood heater must remain sealed and unaltered. Any such wood heater must be made available to the Administrator upon request for inspection and testing.

(d) Each manufacturer of an affected wood heater model line certified under § 60.533(c) or (f) must submit a report to the Administrator every 2 years following issuance of a certificate of compliance for each model line. This report must include the sales for each model by state and certify that no changes in the design or manufacture of this model line have been made that require recertification under § 60.533(k).

(e)(1) Unless otherwise specified, all records required under this section must be maintained by the manufacturer, commercial owner of the affected wood heater, approved test laboratory or third-party certifier for a period of no less than 5 years.

(2) Unless otherwise specified, all reports to the Administrator required under this subpart must be made to: *WoodHeaterReports@epa.gov.*

(f) Within 60 days after the date of completing each performance test, *e.g.,* initial certification test, tests conducted for quality assurance, and tests for renewal or recertification, each manufacturer must submit the performance test data electronically to *WoodHeaterReports@epa.gov.* Owners or operators who claim that some of the information being submitted is CBI (*e.g.,* design drawings) must submit a complete file, including the information claimed to be CBI, on a compact disk or other commonly used electronic storage media (including, but not limited to, flash drives) by mail, and the same file, with the CBI omitted, electronically. The compact disk must be clearly marked as CBI and mailed to U.S. EPA, OECA CBI Office, Attention: Residential Wood Heater Compliance Program Lead, 1200 Pennsylvania Avenue NW., Washington, DC 20004. Emission data, including all information necessary to determine compliance, except sensitive engineering drawings and sensitive detailed material specifications, may not be claimed as CBI.

(g) Within 30 days of receiving a certification of compliance for a model line, the manufacturer must make the full non-CBI test report and the summary of the test report available to the public on the manufacturer's Web site.

(h) Each manufacturer who uses the exemption for R&D heaters under § 60.530(b)(2) must maintain records for at least 5 years documenting where the heaters were located, that the heaters were never offered for sale or sold and that the heaters were not used for the purpose of heating.

§ 60.538 What activities are prohibited under this subpart?

(a) No person is permitted to advertise for sale, offer for sale, sell or operate an affected wood heater that does not have affixed to it a permanent label pursuant to § 60.536 (b) through (e), as applicable.

(b) No person is permitted to advertise for sale, offer for sale, or sell an affected wood heater labeled under § 60.536(e)(1) except for export. No person is permitted to operate an affected wood heater in the United States if it is labeled under § 60.536(e)(1).

(c)(1) No commercial owner is permitted to advertise for sale, offer for sale or sell an affected wood heater permanently labeled under § 60.536 (b) through (d), as applicable, unless:

(i) The affected wood heater has been certified to comply with the 2015 or 2020 particulate matter emission standards pursuant to § 60.532, as applicable. This prohibition does not apply to wood heaters affected by this subpart that have been previously owned and operated by a noncommercial owner; and

(ii) The commercial owner provides any purchaser or transferee with an owner's manual that meets the requirements of § 60.536(g) and a copy of the warranty.

(2) No commercial owner is permitted to advertise for sale, offer for sale, or sell an affected wood heater permanently labeled under § 60.536(b) and (c), unless the affected wood heater has been certified to comply with the 2015 or 2020 particulate matter emission standards of § 60.532, as applicable.

(3) A commercial owner other than a manufacturer complies with the requirements of paragraph (c)(1) of this section if the commercial owner—

(i) Receives the required documentation from the manufacturer or a previous commercial owner; and

(ii) Provides that documentation unaltered to any person to whom the wood heater that it covers is sold or transferred.

(d)(1) In any case in which the Administrator revokes a certificate of compliance either for the submission of false or inaccurate information or other fraudulent acts, or based on a finding under § 60.533(l)(1)(ii) that the certification test was not valid, the Administrator may give notice of that revocation and the grounds for it to all commercial owners.

(2) On and after the date of receipt of the notice given under paragraph (d)(1) of this section, no commercial owner is permitted to sell any wood heater covered by the revoked certificate (other than to the manufacturer) unless the model line has been recertified in accordance with this subpart.

(e) No person is permitted to install or operate an affected wood heater except in a manner consistent with the instructions on its permanent label and in the owner's manual pursuant to § 60.536(g), including only using fuels for which the unit is certified.

(f) No person is permitted to operate, sell or offer for sale an affected wood heater that was originally equipped with a catalytic combustor if the catalytic element is deactivated or removed.

(g) No person is permitted to operate, sell or offer for sale an affected wood heater that has been physically altered to exceed the tolerance limits of its certificate of compliance, pursuant to § 60.533(k).

(h) No person is permitted to alter, deface, or remove any permanent label required to be affixed pursuant to § 60.536(a) through (e), as applicable.

(i) If a temporary label is affixed to the wood heater, retailers may not sell or offer for sale that wood heater unless the temporary label affixed is in accordance with § 60.536(f), as applicable.

§ 60.539 What hearing and appeal procedures apply to me?

(a)(1) The affected manufacturer, laboratory or third-party certifier may request a hearing under this section within 30 days following receipt of the required notification in any case where the Administrator—

(i) Denies an application for a certificate of compliance under § 60.533(c) or § 60.533(f);

(ii) Denies an application for a renewal of certification under § 60.533(i);

(iii) Issues a notice of revocation of certification under § 60.533(1);

(iv) Denies an application for laboratory approval under § 60.535(a);

(v) Issues a notice of revocation of laboratory approval under § 60.535(b);

(vi) Denies an application for third-party certifier approval under § 60.535(d); or

(vii) Issues a notice of revocation of third-party certifier approval under § 60.535(e).

(2) In any case where the Administrator issues a notice of revocation under § 60.533(n)(3)(ii), the manufacturer may request a hearing under this section with the time limits set out in § 60.533(n)(3)(ii).

(b) Any hearing request must be in writing, must be signed by an

authorized representative of the petitioning manufacturer or laboratory and must include a statement setting forth with particularity the petitioner's objection to the Administrator's determination or proposed determination.

(c)(l) Upon receipt of a request for a hearing under paragraph (a) of this section, the Administrator will request the Chief Administrative Law Judge to designate an Administrative Law Judge as Presiding Officer for the hearing. If the Chief Administrative Law Judge replies that no Administrative Law Judge is available to perform this function, the Administrator will designate a Presiding Officer who has not had any prior responsibility for the matter under review, and who is not subject to the direct control or supervision of someone who has had such responsibility.

(2) The hearing will commence as soon as practicable at a time and place fixed by the Presiding Officer.

(3)(i) A motion for leave to intervene in any proceeding conducted under this section must set forth the grounds for the proposed intervention, the position and interest of the movant and the likely impact that intervention will have on the expeditious progress of the proceeding. Any person already a party to the proceeding may file an answer to a motion to intervene, making specific reference to the factors set forth in the foregoing sentence and paragraph (c)(3)(iii) of this section, within 10 days after service of the motion for leave to intervene.

(ii) A motion for leave to intervene in a proceeding must ordinarily be filed before the first prehearing conference or, in the absence of a prehearing conference, prior to the setting of a time and place for a hearing. Any motion filed after that time must include, in addition to the information set forth in paragraph (c)(3)(i) of this section, a statement of good cause for the failure to file in a timely manner. The intervener shall be bound by any agreements, arrangements and other matters previously made in the proceeding.

(iii) A motion for leave to intervene may be granted only if the movant demonstrates that his presence in the proceeding would not unduly prolong or otherwise prejudice the adjudication of the rights of the original parties, and that movant may be adversely affected by a final order. The intervener will become a full party to the proceeding upon the granting of leave to intervene.

(iv) Persons not parties to the proceeding may move for leave to file amicus curiae briefs. The movant must state his interest and the reasons why the proposed amicus brief is desirable. If the motion is granted, the Presiding Officer or Administrator will issue an order setting the time for filing such brief. An amicus curia may participate in any briefing after his motion is granted, and will be served with all briefs, reply briefs, motions and orders relating to issues to be briefed.

(4) In computing any period of time prescribed or allowed in this subpart, the day of the event from which the designated period begins to run will not be included. Saturdays, Sundays and federal legal holidays will be included. When a stated time expires on a Saturday, Sunday or legal holiday, the stated time period will be extended to include the next business day.

(d)(l) Upon his appointment, the Presiding Officer must establish a hearing file. The file will consist of the notice issued by the Administrator under §§ 60.533(c)(2), 60.533(f)(3), 60.533(i)(4), 60.533(l)(2), 60.533(n)(3)(ii)(A), 60.535(a)(3), 60.535(b)(2), 60.535(d)(3) or 60.535(e)(2) together with any accompanying material, the request for a hearing and the supporting data submitted therewith, and all documents relating to the request for certification or approval or the proposed revocation of either.

(2) The hearing file must be available for inspection by any party, to the extent authorized by law, at the office of the Presiding Officer, or other place designated by him.

(e) Any party may appear in person, or may be represented by counsel or by any other duly authorized representative.

(f)(l) The Presiding Officer upon the request of any party, or at his discretion, may order a prehearing conference at a time and place specified by him to consider the following:

(i) Simplification of the issues,

(ii) Stipulations, admissions of fact, and the introduction of documents,

(iii) Limitation of the number of expert witnesses,

(iv) Possibility of agreement disposing of all or any of the issues in dispute,

(v) Such other matters as may aid in the disposition of the hearing, including such additional tests as may be agreed upon by the parties.

(2) The results of the conference must be reduced to writing by the Presiding Officer and made part of the record.

(g)(l) Hearings will be conducted by the Presiding Officer in an informal but orderly and expeditious manner. The parties may offer oral or written evidence, subject to the exclusion by the Presiding Officer of irrelevant, immaterial and repetitious evidence.

(2) Witnesses will not be required to testify under oath. However, the Presiding Officer will call to the attention of witnesses that their statements may be subject to penalties under title 18 U.S.C. 1001 for knowingly making false statements or representations or using false documents in any matter within the jurisdiction of any department or agency of the United States.

(3) Any witness may be examined or cross-examined by the Presiding Officer, the parties or their representatives.

(4) Hearings must be recorded verbatim. Copies of transcripts of proceedings may be purchased by the applicant from the reporter.

(5) All written statements, charts, tabulations and similar data offered in evidence at the hearings must, upon a showing satisfactory to the Presiding Officer of their authenticity, relevancy and materiality, be received in evidence and will constitute a part of the record.

(h)(l) The Presiding Officer will make an initial decision which must include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law or discretion presented on the record. The findings, conclusions and written decision must be provided to the parties and made a part of the record. The initial decision will become the decision of the Administrator without further proceedings unless there is an appeal to the Administrator or motion for review by the Administrator. Except as provided in paragraph (h)(3) of this section, any such appeal must be taken within 20 days of the date the initial decision was filed.

(2) On appeal from or review of the initial decision, the Administrator will have all the powers which he would have in making the initial decision including the discretion to require or allow briefs, oral argument, the taking of additional evidence or the remanding to the Presiding Officer for additional proceedings. The decision by the Administrator must include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law or discretion presented on the appeal or considered in the review.

(3) In any hearing requested under paragraph (a)(2) of this section the Presiding Officer must render the initial decision within 60 days of that request. Any appeal to the Administrator must be taken within 10 days of the initial decision, and the Administrator must render a decision in that appeal within 30 days of the filing of the appeal.

§ 60.539a Who implements and enforces this subpart?

(a) Under section 111(c) of the Clean Air Act, the Administrator may delegate the following implementation and enforcement authority to a state, local or tribal authority upon request:

(1) Enforcement of prohibitions on the installation and operation of affected wood heaters in a manner inconsistent with the installation and owner's manual;

(2) Enforcement of prohibitions on operation of catalytic wood heaters where the catalyst has been deactivated or removed;

(3) Enforcement of prohibitions on advertisement and/or sale of uncertified model lines;

(4) Enforcement of prohibitions on advertisement and/or sale of affected heaters that do not have required permanent label;

(5) Enforcement of proper labeling of affected wood heaters; and

(6) Enforcement of compliance with other labeling requirements for affected wood heaters.

(7) Enforcement of certification testing procedures;

(8) Enforcement of requirements for sealing of the tested heaters and meeting parameter limits; and

(9) Enforcement of compliance requirements of EPA-approved laboratories.

(b) Delegations shall not include:

(1) Decisions on certification;

(2) Revocation of certification;

(3) Establishment or revision of standards;

(4) Establishment or revision of test methods;

(5) Laboratory and third-party certifier approvals and revocations;

(6) Enforcing provisions governing content of owner's manuals; and

(7) Hearings and appeals procedures.

(c) Nothing in these delegations will prohibit the Administrator from enforcing any applicable requirements.

(d) Nothing in these delegations will limit delegated entities from using their authority under section 116 of the Clean Air Act to adopt or enforce more restrictive requirements.

§ 60.539b What parts of the General Provisions do not apply to me?

The following provisions of subpart A of part 60 do not apply to this subpart:

(a) Section 60.7;

(b) Section 60.8(a), (c), (d), (e), (f) and (g);

(c) Section 60.14; and

(c) Section 60.15(d).

Subpart PPPP—[Reserved]

■ 4. Subpart PPPP is added and reserved.

■ 5. Subpart QQQQ is added to read as follows:

Subpart QQQQ—Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces

Sec.

60.5472 Am I subject to this subpart?
60.5473 What definitions must I know?
60.5474 What standards and requirements must I meet and by when?
60.5475 What compliance and certification requirements must I meet and by when?
60.5476 What test methods and procedures must I use to determine compliance with the standards and requirements for certification?
60.5477 What procedures must I use for EPA approval of a test laboratory or EPA approval of a third-party certifier?
60.5478 What requirements must I meet for permanent labels, temporary labels (hangtags), and owner's manuals?
60.5479 What records must I keep and what reports must I submit?
60.5480 What activities are prohibited under this subpart?
60.5481 What hearing and appeal procedures apply to me?
60.5482 Who implements and enforces this subpart?
60.5483 What parts of the General Provisions do not apply to me?

Subpart QQQQ—Standards of Performance for New Residential Hydronic Heaters and Forced-Air Furnaces

§ 60.5472 Am I subject to this subpart?

(a) You are subject to this subpart if you manufacture, sell, offer for sale, import for sale, distribute, offer to distribute, introduce or deliver for introduction into commerce in the United States, or install or operate a residential hydronic heater, forced-air furnace or other central heater manufactured on or after May 15, 2015, except as provided in paragraph (c) of this section.

(b) Each residential hydronic heater, forced-air furnace or other central heater must comply with the provisions of this subpart unless exempted under paragraphs (b)(1) through (b)(3) of this section. These exemptions are determined by rule applicability and do not require additional EPA notification or public notice.

(1) Affected residential hydronic heaters, forced-air furnaces or other central heaters manufactured in the United States for export are exempt from the applicable emission limits of § 60.5474 and the requirements of § 60.5475.

(2) Affected residential hydronic heaters, forced-air furnaces or other central heaters used for research and development purposes that are never offered for sale or sold and that are not used to provide heat are exempt from the applicable emission limits of § 60.5474 and the requirements of § 60.5475. No more than 12 affected residential central heaters manufactured per model line may be exempted for this purpose.

(3) Appliances that do not burn wood or wood pellets or wood chips (such as coal-only central heaters that meet the definition in § 60.5473 or corn-only central heaters) are exempt from the applicable emission limits of § 60.5474 and the requirements of § 60.5475 provided that all advertising and warranties clearly denote that wood burning is prohibited in these appliances.

(c) The following are not affected central heaters and are not subject to this subpart:

(1) Residential wood heaters subject to subpart AAA of this part.

(2) Residential masonry heaters as defined in § 60.5473.

§ 60.5473 What definitions must I know?

As used in this subpart, all terms not defined herein have the same meaning given them in the Clean Air Act and subpart A of this part.

Approved test laboratory means a test laboratory that is approved for central heater certification testing under § 60.5477 or is an independent third-party test laboratory that is accredited under ISO–IEC Standard 17025 to perform testing using the test methods specified in § 60.5476 by an accreditation body that is a full member signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement and approved by the EPA for conducting testing under this subpart.

Catalytic combustor means a device coated with a noble metal used in a wood heater to lower the temperature required for combustion.

Central heater means a fuel-burning device designed to burn wood or wood pellet fuel that warms spaces other than the space where the device is located, by the distribution of air heated by the furnace through ducts or liquid heated in the device and distributed typically through pipes. Unless otherwise specified, these devices include, but are not limited to, residential forced-air furnaces (small and large) and residential hydronic heaters.

Chip wood fuel means wood chipped into small pieces that are uniform in size, shape, moisture, density and energy content.

Coal-only hydronic heater or forced-air furnace means an enclosed, coal-

burning appliance capable of space heating or domestic water heating that has all of the following characteristics:

(1) Installation instructions, owner's manual and marketing information that state that the use of wood in the appliance, except for coal ignition purposes, is prohibited by law; and

(2) The model is listed by a nationally recognized safety-testing laboratory for coal use only, except for coal ignition purposes.

Commercial owner means any person who owns or controls a residential hydronic heater, forced-air furnace or other affected central heater in the course of the business of the manufacture, importation, distribution, or sale of the unit.

Large residential forced-air furnace means a residential forced-air furnace that is capable of a heat output of 65,000 BTU per hour or greater.

Manufactured means completed and ready for shipment (whether or not assembled or packaged) for purposes of determining the date of manufacture.

Manufacturer means any entity that constructs or imports into the United States a central heater.

Model line means all central heaters offered for sale by a single manufacturer that are similar in all material respects that would affect emissions as defined in this section.

Particulate matter (PM) means total particulate matter including coarse particulate (PM_{10}) and fine particulate ($PM_{2.5}$).

Pellet fuel means refined and densified solid wood shaped into small pellets or briquettes that are uniform in size, shape, moisture, density and energy content.

Representative affected wood or central heater means an individual heater that is similar in all material respects that would affect emissions as defined in this section to other heaters within the model line it represents.

Residential forced-air furnace means a fuel burning device designed to burn wood or wood pellet fuel that warms spaces other than the space where the furnace is located, by the distribution of air heated by the furnace through ducts.

Residential hydronic heater means a fuel burning device designed to burn wood or wood pellet fuel for the purpose of heating building space and/or water through the distribution, typically through pipes, of a fluid heated in the device, typically water or a water and antifreeze mixture.

Residential masonry heater means a factory-built or site-built wood-burning device in which the heat from intermittent fires burned rapidly in the firebox is stored in the refractory mass for slow release to building spaces. Masonry heaters are site-built (using local materials or a combination of local materials and manufactured components) or site-assembled (using factory-built components), solid fuel-burning heating appliances constructed mainly of refractory materials (*e.g.,* masonry materials or soapstone. They typically have an interior construction consisting of a firebox and heat exchange channels built from refractory components, through which flue gases are routed. ASTM E1602 "Standard Guide for Construction of Solid Fuel Burning Masonry Heaters" provides design and construction information for the range of masonry heaters most commonly built in the United States. The site-assembled models are generally listed to UL–1482.

Sale means the transfer of ownership or control, except that a transfer of control of an affected central heater for research and development purposes within the scope of § 60.5472(b)(2) is not a sale.

Similar in all material respects that would affect emissions means that the construction materials, exhaust and inlet air system, and other design features are within the allowed tolerances for components identified in § 60.5475(k).

Small residential forced-air furnace means a residential forced-air furnace that is only capable of a maximum heat output of less than 65,000 BTU per hour.

Sold at retail means the sale by a commercial owner of a central heater to the ultimate purchaser/user or noncommercial purchaser.

Third-party certifier (sometimes called third-party certifying body or product certifying body) means an independent third party that is accredited under ISO–IEC Standards 17025 and 17065 to perform certifications, inspections and audits by an accreditation body that is a full member signatory to the International Laboratory Accreditation Cooperation Mutual Recognition Arrangement and approved by the EPA for conducting certifications, inspections and audits under this subpart.

Unseasoned wood means wood with an average moisture content of 20 percent or more.

Valid certification test means a test that meets the following criteria:

(1) The Administrator was notified about the test in accordance with § 60.5476(h);

(2) The test was conducted by an approved test laboratory as defined in this section;

(3) The test was conducted on a central heater similar in all material respects that would affect emissions as defined in this section to other central heaters of the model line that is to be certified; and

(4) The test was conducted in accordance with the test methods and procedures specified in § 60.5476.

Wood heater under this subpart means an enclosed, wood burning-appliance capable of and intended for residential central heating or central heating and domestic water heating. Unless otherwise specified, these devices include, but are not limited to, hydronic heaters and forced-air furnaces.

§ 60.5474 What standards and requirements must I meet and by when?

(a) *Standards.* Unless exempted under § 60.5472, no person is permitted to:

(1) On or after May 15, 2015, manufacture, import into the United States or sell at retail a residential hydronic heater unless it has been certified to meet the 2015 particulate matter emission limits in paragraph (b)(1) of this section, except that a residential hydronic heater that was manufactured on or before May 15, 2015 may be imported into the United States and/or sold at retail on or before December 31, 2015.

(2) On or after May 15, 2020 manufacture or sell at retail a residential hydronic heater unless it has been certified to meet the 2020 particulate matter emission limit in paragraph (b)(2) or (b)(3) of this section.

(3) On or after May 15, 2015, manufacture or sell at retail a residential forced-air furnace unless it complies with the work practice and operating standards in paragraphs (d), (e), (f) and (g) of this section and the owner's manual requirements in Appendix I.

(4) On or after May 16, 2016, manufacture or sell at retail a small residential forced-air furnace unless it has been certified to meet the 2016 particulate matter emission limits in paragraph (b)(4) of this section

(5) On or after May 15, 2017 manufacture or sell at retail a large forced-air furnace unless it has been certified to meet the 2017 particulate matter emission limits in paragraph (b)(5) of this section.

(6) On or after May 15, 2020 manufacture or sell at retail a small or large residential forced-air furnace unless it has been certified to meet the 2020 particulate matter emission limit in paragraph (b)(6) of this section.

(b)(1) 2015 residential hydronic heater particulate matter emission limit: A weighted average of 0.32 lb/mmBtu

(0.137 g/MJ) heat output and a maximum per individual burn rate of 18.0 g/hr (0.041 lb/hr) as determined by the test methods and procedures in § 60.5476 or an alternative crib wood or cord wood test method approved by the Administrator.

(2) 2020 residential hydronic heater particulate matter emission limit: 0.10 lb/mmBtu (0.026 g/MJ) heat output per individual burn rate as determined by the crib wood test methods and procedures in § 60.5476 or an alternative crib wood test method approved by the Administrator .

(3) 2020 residential hydronic heater cord wood alternative compliance option for particulate matter emission limit: 0.15 lb/mmBtu (0.026 g/MJ) heat output per individual burn rate as determined by the cord wood test methods and procedures in § 60.5476 or an alternative cord wood test method approved by the Administrator.

(4) 2016 small forced-air furnace particulate matter emission limit: A weighted average of 0.93 lb/mmBtu (0.40 g/MJ) heat output as determined by the test methods and procedures in § 60.5476.

(5) 2017 large forced-air furnace particulate matter emission limit: A weighted average of 0.93 lb/mmBtu (0.40 g/MJ) heat output as determined by the test methods and procedures in § 60.5476.

(6) 2020 forced-air furnace particulate matter emission limit: 0.15 lb/mmBtu (0.026 g/MJ) heat output per individual burn rate as determined by the cord wood test methods and procedures in § 60.5476 or cord wood test methods approved by the Administrator.

(c) [Reserved]

(d) *Chip wood fuel requirements.* Operators of wood central heaters, including hydronic heaters and forced-air furnaces, that are certified to burn chip wood fuels may only burn wood chips that have been specified in the owner's manual. The chip wood fuel must meet the following minimum requirements:

(1) Moisture content: Less than 35 percent,

(2) Inorganic fines: Less than or equal to 1 percent;

(3) Chlorides: Less than or equal to 300 parts per million by weight;

(4) Ash content: No more than 2 percent;

(5) No demolition or construction waste; and

(6) Trace metals: Less than 100 mg/kg.

(e) *Pellet fuel requirements.* Operators of wood central heaters, including outdoor residential hydronic heaters, indoor residential hydronic heaters, and residential forced-air furnaces, that are certified to burn pellet fuels may only burn pellets that have been graded under a licensing agreement with a third-party organization approved by the EPA. The Pellet Fuels Institute, ENplus and CANplus are initially deemed to be approved third-party organizations for this purpose, and additional organizations may apply to the Administrator for approval. The pellet fuel must meet the following minimum requirements as assured through a quality assurance program licensed by a third-party organization approved by the EPA:

(1) Density: Consistent hardness and energy content with a minimum density of 38 pounds/cubic foot;

(2) Dimensions: Maximum length of 1.5 inches and diameter between 0.230 and 0.285 inches;

(3) Inorganic fines: Less than or equal to 1 percent;

(4) Chlorides: Less than or equal to 300 parts per million by weight; and

(5) Ash content: No more than 2 percent.

(6) Contains no demolition or construction waste;

(7) Trace metals: Less than 100 mg/kg; and

(8) None of the prohibited fuels in paragraph (f) of this section.

(f) *Prohibited fuel types.* No person is permitted to burn any of the following materials in an outdoor residential hydronic heater, indoor residential hydronic heater, residential forced-air furnace or other affected central heater:

(1) Residential or commercial garbage;

(2) Lawn clippings or yard waste;

(3) Materials containing rubber, including tires;

(4) Materials containing plastic;

(5) Waste petroleum products, paints or paint thinners, or asphalt products;

(6) Materials containing asbestos;

(7) Construction or demolition debris;

(8) Paper products; cardboard, plywood or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected central heater;

(9) Railroad ties or pressure treated lumber;

(10) Manure or animal remains;

(11) Salt water driftwood or other or other previously salt water saturated materials;

(12) Unseasoned wood;

(13) Any materials that are not included in the warranty and owner's manual for the subject heater or furnace; or

(14) Any materials that were not included in the certification tests for the subject heater or furnace.

(g) *Operation of affected wood heaters.* A user must operate an outdoor residential hydronic heater, indoor residential hydronic heater, residential forced-air furnace or other affected central heater in a manner consistent with the owner's manual. The owner's manual must clearly specify that operation in a manner inconsistent with the owner's manual would void the warranty.

(h) *Temperature sensor requirement.* An affected wood heater equipped with a catalytic combustor must be equipped with a temperature sensor that can monitor combustor gas stream temperatures within or immediately downstream [within 2.54 centimeters (1 inch)] of the catalytic combustor surface.

§ 60.5475 What compliance and certification requirements must I meet and by when?

(a) *Certification requirement.* (1) Each affected residential hydronic heater, forced-air furnace and other central heater must be certified to be in compliance with the applicable emission standards and other requirements of this subpart. For each model line manufactured or sold by a single entity, *e.g.,* company or manufacturer, compliance with applicable emission standards of § 60.5474 must be determined based on testing of representative affected central heaters within the model line. If one entity licenses a model line to another entity, each entity's model line must be certified. If an entity intends to change the name of the entity or the name of the model, the manufacturer must apply for a new certification 60 days before making the change.

(2) The manufacturer of each model line must submit the information required in paragraph (b) of this section and follow either the certification process in paragraphs (c) through (e) of this section (for forced-air furnaces) or the certification procedure specified in paragraph (f) of this section.

(3) Models qualified as meeting the Phase 2 emission levels under the 2011 EPA hydronic heater partnership agreement are automatically deemed to have a certificate of compliance for the 2015 particulate matter emission standards and be valid until the effective date for the 2020 particulate matter emission standards.

(4) Models certified by the New York State Department of Environment and Conservation to meet the emission levels in § 60.5474(b) are automatically deemed to have a certificate of compliance for the 2015 particulate matter emission standards and be valid

until the effective date for the 2020 particulate matter emission standards.

(5) Models approved by the New York State Energy Research and Development Authority under the Renewable Heat New York (RHNY) Biomass Boiler Program are automatically deemed to have a certificate of compliance for the 2015 particulate matter emission standards and be valid until the effective date for the 2020 particulate matter emission standards provided that they comply with the thermal storage requirements in the RHNY program.

(6) Small forced-air furnace models that are certified under CSA B415.1–10 (IBR, see § 60.17), by an EPA approved third-party certifier, to meet the 2016 particulate matter emission level will be automatically deemed to have a certificate of compliance for the 2016 particulate matter emission standards and be valid until the effective date for the 2020 particulate matter emission standards.

(7) Large forced-air furnace models that are certified under CSA B415.1–10 (IBR, see § 60.17), by an EPA approved third-party certifier, to meet the 2017 particulate matter emission level will be automatically deemed to have a certificate of compliance for the 2017 particulate matter emission standards and be valid until the effective date of the 2020 particulate matter emission standards.

(b) *Application for a certificate of compliance.* Any manufacturer of an affected residential hydronic heater or forced-air furnace or other central heater must apply to the Administrator for a certificate of compliance for each model line. The application must be submitted to: *WoodHeaterReports@epa.gov.* The application must be signed by a responsible representative of the manufacturer or an authorized representative and must contain the following:

(1) The model name and/or design number. The model name and/or design number must clearly distinguish one model from another. The name and/or design number cannot include the EPA symbol or logo or name or derivatives such as ''EPA.''

(2) Engineering drawings and specifications of components that may affect emissions (including specifications for each component listed in paragraph (k) of this section). Manufacturers may use assembly or design drawings that have been prepared for other purposes, but must designate on the drawings the dimensions of each component listed in paragraph (k) of this section. Manufacturers must identify dimensions of components listed in paragraph (k)(2) of this section that are different from those specified in that paragraph, and show that such differences cannot reasonably be anticipated to cause central heaters in the model line to exceed the applicable emission limits. The drawings must identify how the emission critical parts, such as air tubes and catalyst, can be readily inspected and replaced.

(3) A statement whether the firebox or any firebox component (including the materials listed in paragraph (k)(3) of this section) will be composed of material different from the material used for the firebox or firebox component in the central heater on which certification testing was performed and a description of any such differences and demonstration that any such differences may not reasonably be anticipated to adversely affect emissions or efficiency.

(4) Clear identification of any claimed confidential business information (CBI). Submit such information under separate cover to the EPA CBI Office; Attn: Residential Wood Heater Compliance Program Lead, 1200 Pennsylvania Ave. NW., Washington, DC 20004. Note that all emissions data, including all information necessary to determine emission rates in the format of the standard, cannot be claimed as CBI.

(5) All documentation pertaining to a valid certification test, including the complete test report and, for all test runs: Raw data sheets, laboratory technician notes, calculations and test results. Documentation must include the items specified in the applicable test methods. Documentation must include discussion of each test run and its appropriateness and validity, and must include detailed discussion of all anomalies, whether all burn rate categories were achieved, any data not used in the calculations and, for any test runs not completed, the data collected during the test run and the reason(s) that the test run was not completed. The documentation must show that the burn rate for the low burn rate category is no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer. The test report must include a summary table that clearly presents the individual and overall emission rates, efficiencies and heat outputs. Submit the test report and all associated required information according to the procedures for electronic reporting specified in § 60.5479(f).

(6) A copy of the warranties for the model line, which must include a statement that the warranties are void if the unit is used to burn materials for which the unit is not certified by the EPA and void if not operated according to the owner's manual.

(7) A statement that the manufacturer will conduct a quality assurance program for the model line that satisfies the requirements of paragraph (m) of this section.

(8) A statement describing how the tested unit was sealed by the laboratory after the completion of certification testing and asserting that such unit will be stored by the manufacturer in the sealed state until 5 years after the certification test.

(9) Statements that the central heater manufactured under this certificate will be—

(i) Similar in all material respects that would affect emissions as defined in this subpart to the central heater submitted for certification testing, and

(ii) Labeled as prescribed in § 60.5478.

(iii) Accompanied by an owner's manual that meets the requirements in § 60.5478. In addition, a copy of the owner's manual must be submitted to the EPA and be available to the public on the manufacturer's Web site.

(10) A statement that the manufacturer has entered into contracts with an approved laboratory and an approved third-party certifier that satisfy the requirements of paragraph (f) of this section.

(11) A statement that the approved laboratory and approved third-party certifier are allowed to submit information on behalf of the manufacturer, including any claimed to be CBI.

(12) A statement that the manufacturer will place a copy of the certification test report and summary on the manufacturer's Web site available to the public within 30 days after the Administrator issues a certificate of compliance.

(13) A statement of acknowledgment that the certificate of compliance cannot be transferred to another manufacturer or model line without written approval by the Administrator.

(14) A statement acknowledging that it is unlawful to sell, distribute, or offer to sell or distribute an affected wood heater without a valid certificate of compliance.

(15) Contact information for the responsible representative of the manufacturer and all authorized representatives, including name, affiliation, physical address, telephone number and email address.

(c) *Administrator approval process.* (1) The Administrator may issue a certificate of compliance for a model line if the Administrator determines, based on all information submitted by

the applicant and any other relevant information available, that:

(i) A valid certification test demonstrates that the representative affected central heater complies with the applicable emission standards in § 60.5474;

(ii) Any tolerances or materials for components listed in paragraph (k)(2) or (3) of this section that are different from those specified in those paragraphs may not reasonably be anticipated to cause central heaters in the model line to exceed the applicable emission limits; and

(iii) The requirements of paragraph (b) of this section have been met.

(2) The Administrator will deny certification if the Administrator determines that the criteria in paragraph (c)(1) of this section have not been satisfied. Upon denying certification under this paragraph, the Administrator will give written notice to the manufacturer setting forth the basis for this determination.

(d) *Level of compliance certification.* The Administrator will issue the certificate of compliance for the most stringent particulate matter emission standard that the tested representative central heater meets under § 60.5474.

(e) *Conditional, temporary certificate of compliance.* A conditional, temporary certificate of compliance with the Step 1 p.m. emission standards may be granted by the Administrator until May 16, 2016 for small or large forced-air furnaces based on the manufacturer's submittal of a complete certification application meeting all requirements in § 60.5475(b). The application must include the full test report by an EPA-approved laboratory and all required compliance statements by the manufacturer with the exception of a certificate of conformity by an EPA approved third-party certifier. The conditional, temporary approval would allow early marketing of forced-air furnaces as having a conditional, temporary certificate of compliance with the Step 1 p.m. emission standards until May 16, 2016 or until the Administrator completes the review of the application, whichever is earlier.

(f) *Third-party certifier-based application process.* (1) Any manufacturer of an affected central heater must apply to the Administrator for a certificate of compliance for each model line. The manufacturer must meet the following requirements:

(i) The manufacturer must contract with a third-party certifier for certification services. The contract must include regular (at least annual) unannounced audits under ISO–IEC Standard 17065 to ensure that the manufacturer's quality assurance plan is being implemented. The contract must also include a report for each audit under ISO–IEC Standard 17065 that fully documents the results of the audit. The contract must include authorization and requirement for the third-party certifier to submit all such reports to the Administrator and the manufacturer within 30 days of the audit. The audit report must identify deviations from the manufacturer's quality assurance plan and specify the corrective actions that need to be taken to address each identified deficiency.

(ii) The manufacturer must submit the materials specified in paragraph (b) of this section and a quality assurance plan that meets the requirements of paragraph (m) of this section to the third-party certifier. The quality assurance plan must ensure that units within a model line will be similar in all material respects that would affect emissions to the wood heater submitted for certification testing, and it must include design drawings for the model line.

(iii) The manufacturer must apply to the third-party certifier for a certification of conformity with the applicable requirements of this subpart for the model line.

(A) After testing by an approved test laboratory is complete, certification of conformity with the emission standards in § 60.5474 must be performed by the manufacturer's contracted third-party certifier.

(B) The third-party certifier may certify conformity if the emission tests have been conducted per the appropriate guidelines: The test report is complete and accurate; the instrumentation used for the test was properly calibrated; the test report shows that the representative affected central heater meets the applicable emission limits specified in § 60.5474; and the quality assurance plan is adequate to ensure that units within the model line will be similar in all material respects that would affect emissions to the central heater submitted for certification testing, and that the affected heaters would meet all applicable requirements of this subpart.

(iv) The manufacturer must then submit to the Administrator an application for a certificate of compliance that includes the certification of conformity, quality assurance plan, test report and all supporting documentation specified in paragraph (b) of this section.

(v) The submission also must include a statement signed by a responsible official of the manufacturer or authorized representative that the manufacturer has complied with and will continue to comply with all requirements of this subpart for certificate of compliance and that the manufacturer remains responsible for compliance regardless of any error by the test laboratory or third-party certifier.

(2) The Administrator will issue to the manufacturer a certificate of compliance for a model line if it is determined, based on all of the information submitted in the application for certification and any other relevant information, that:

(i) A valid certification of conformity has demonstrated that the representative affected central heater complies with the applicable emission standards in § 60.5474;

(ii) Any tolerances or materials for components listed in paragraph (k)(2) or (3) of this section that are different from those specified in those paragraphs may not be reasonably anticipated to cause central heaters in the model line to exceed the applicable emission limits;

(iii) The requirements of paragraphs (b) of this section have been met; and

(iv) A valid certificate of conformity for the model line has been prepared and submitted.

(3) The Administrator will deny certification if the Administrator determines that the criteria in paragraph (f)(2) of this section have not been satisfied. Upon denying certification under this paragraph, the Administrator will give written notice to the manufacturer setting forth the basis for the determination.

(g) *Waiver from submitting test results.* An applicant for certification may apply for a potential waiver of the requirement to submit the results of a certification test pursuant to paragraph (b) of this section, if the central heater meets either of the following conditions:

(1) The central heaters of the model line are similar in all material respects that would affect emissions, as defined in § 60.5473 and paragraph (k) of this section, to another model line that has already been issued a certificate of compliance. A manufacturer that seeks a waiver of certification testing must identify the model line that has been certified, and must submit a copy of an agreement with the owner of the design permitting the applicant to produce central heaters of that design.

(2) The manufacturer has previously conducted a valid certification test to demonstrate that the central heaters of the model line meet the applicable standard specified in § 60.5474.

(h) *Certification period.* Unless revoked sooner by the Administrator, a certificate of compliance will be valid

for 5 years from the date of issuance or until a more stringent standard comes into effect, whichever is sooner.

(i) *Renewal of certification.* (1) The manufacturer must renew a model line's certificate of compliance or recertify the model line every 5 years, or the manufacturer may choose to no longer manufacture or sell that model line after the expiration date. If the manufacturer chooses to no longer manufacture that model line, then the manufacturer must submit a statement to the Administrator to that effect.

(2) A manufacturer of an affected residential hydronic heater or forced-air furnace or other central heater may apply to the Administrator for potential renewal of its certificate of compliance by submitting the material specified in paragraph (b) and following the procedures specified in paragraph (f) of this section, or by affirming in writing that the central heaters in the model line continue to be similar in all material respects that would affect emissions to the representative central heater submitted for testing on which the original certificate of compliance was based and requesting a potential waiver from certification testing. The application must include a copy of the review of the draft application and approval by the third-party certifier.

(3) If the Administrator grants a renewal of certification, the Administrator will give written notice to the manufacturer setting forth the basis for the determination and issue a certification renewal.

(4) If the Administrator denies the request for a renewal of certification, the Administrator will give written notice to the manufacturer setting forth the basis for the determination.

(5) If the Administrator denies the request for a renewal of certification, the manufacturer and retailer must not manufacture or sell the previously-certified central heaters after the expiration date of the certificate of compliance.

(j) [Reserved]

(k) *Recertification.* (1) The manufacturer must recertify a model line whenever any change is made in the design submitted pursuant to paragraph (k)(2) of this section that affects or is presumed to affect the particulate matter emission rate for that model line. The manufacturer of an affected central heater must apply to the Administrator for potential recertification by submitting the material specified in paragraph (b) of this section and following the procedures specified in paragraph (f) of this section or by affirming in writing that the change will not cause the central heaters in the model line to exceed applicable emission limits and requesting a waiver from certification testing. The application for recertification must be reviewed and approved by the contracted third-party certifier and a copy of the review and approval must be included. The Administrator may waive this requirement upon written request by the manufacturer, if the manufacturer presents adequate rationale and the Administrator determines that the change may not reasonably be anticipated to cause central heaters in the model line to exceed the applicable emission limits. The granting of such a waiver does not relieve the manufacturer of any compliance obligations under this subpart.

(2) Any change in the design tolerances of any of the following components (where such components are applicable) is presumed to affect particulate matter and carbon monoxide emissions and efficiency if that change exceeds ±0.64 cm (±1/4 inch) for any linear dimension and ±5 percent for any cross-sectional area relating to air introduction systems and catalyst bypass gaps unless other dimensions and cross-sectional areas are previously approved by the Administrator under paragraph (c)(1)(ii) of this section:

(i) Firebox: Dimensions;

(ii) Air introduction systems: Cross-sectional area of restrictive air inlets and outlets, location and method of control;

(iii) Baffles: Dimensions and locations;

(iv) Refractory/insulation: Dimensions and location;

(v) Catalyst: Dimensions and location;

(vi) Catalyst bypass mechanism and catalyst bypass gap tolerances (when bypass mechanism is in closed position): Dimensions, cross-sectional area, and location;

(vii) Flue gas exit: Dimensions and location;

(viii) Door and catalyst bypass gaskets: Dimensions and fit;

(ix) Outer thermal shielding and thermal coverings: Dimensions and location;

(x) Fuel feed system: For central heaters that are designed primarily to burn wood pellet fuel or wood chips and other central heaters equipped with a fuel feed system, the fuel feed rate, auger motor design and power rating, and the angle of the auger to the firebox; and

(xi) Forced air combustion system: For central heaters so equipped, the location and horsepower of blower motors and the fan blade size.

(3) Any change in the materials used for the following components is presumed to affect particulate matter emissions and efficiency:

(i) Refractory/insulation; or

(ii) Door and catalyst bypass gaskets.

(4) A change in the make, model, or composition of a catalyst is presumed to affect particulate matter and carbon monoxide emissions and efficiency, unless the change has been requested by the central heater manufacturer and has been approved in advance by the Administrator, based on test data that demonstrate that the replacement catalyst is equivalent to or better than the original catalyst in terms of particulate matter emission reduction.

(l) *Criteria for revocation of certification.* (1) The Administrator may revoke certification of a product line if it is determined that the central heaters being manufactured or sold in that model line do not comply with the requirements of this subpart. Such a determination will be based on all available evidence, including but not limited to:

(i) Test data from retesting of the original unit on which the certification test was conducted on a unit that is similar in all material respects that would affect emissions;

(ii) A finding that the certification test was not valid. The finding will be based on problems or irregularities with the certification test or its documentation, but may be supplemented by other information;

(iii) A finding that the labeling of the central heater model line or the owner's manual or the associated marketing information does not comply with the requirements of § 60.5478;

(iv) Failure by the manufacturer to comply with the reporting and recordkeeping requirements of § 60.5479;

(v) Physical examination showing that a significant percentage (as defined in the quality assurance plan approved pursuant to paragraph (m) of this section, but no larger than 1 percent) of production units inspected is not similar in all material respects that would affect emissions to the representative affected central heater submitted for certification testing; or

(vi) Failure of the manufacturer to conduct a quality assurance program in conformity with paragraph (m).

(vii) Failure of the approved laboratory to test the central heater using the methods specified in § 60.5476.

(2) Revocation of certification under this paragraph (l) of this section will not take effect until the manufacturer concerned has been given written notice by the Administrator setting forth the basis for the proposed determination

and an opportunity to request a hearing under § 60.5481.

(m) *Quality assurance program.* On or after May 16, 2016, for each certified model line, the manufacturer must conduct a quality assurance program that satisfies the requirements of paragraphs (m)(1) through (5) of this section.

(1) The manufacturer must prepare and operate according to a quality assurance plan for each certified model line that includes specific inspection and testing requirements for ensuring that all units within a model line are similar in all material respects that would affect emissions to the central heater submitted for certification testing and meet the emissions standards in § 60.5474.

(2) The quality assurance plan must be approved by the third-party certifier as part of the certification of conformity process specified in paragraph (f) of this section.

(3) The quality assurance plan must include regular (at least annual) unannounced audits by the third-party certifier under ISO–IEC Standard 17065 to ensure that the manufacturer's quality assurance plan is being implemented.

(4) The quality assurance plan must include a report for each audit under ISO–IEC Standard 17065 that fully documents the results of the audit. The third-party certifier must be authorized and required to submit all such reports to the Administrator within 30 days of the audit. The audit report must identify deviations from the manufacturer's quality assurance plan and specify the corrective actions that need to be taken to address each identified deficiency.

(5) Within 30 days after receiving each audit report, the manufacturer must report to the third-party certifier and to the Administrator its corrective actions and responses to any deficiencies identified in the audit report. No such report is required if an audit report did not identify any deficiencies.

(n) *EPA compliance audit testing.* (1)(i) The Administrator may select by written notice central heaters or model lines for compliance audit testing to determine compliance with the emission standards in § 60.5474.

(ii) The Administrator will transmit a written notification of the selected central heaters or model line(s) to the manufacturer, which will include the name and address of the laboratory selected to perform the audit test and the model name and serial number of the central heater(s) or central heater model line(s) selected to undergo audit testing.

(2)(i) The Administrator may test, or direct the manufacturer to have tested, the central heater(s) from the model line(s) selected under paragraph (n)(1)(i) of this section in a laboratory approved under § 60.5477. The Administrator may select any approved test laboratory or federal laboratory for this audit testing.

(ii) The expense of the compliance audit test is the responsibility of the central heater manufacturer.

(iii) The test must be conducted using the same test method used to obtain certification. If the certification test consisted of more than one particulate matter sampling test method, the Administrator may direct the manufacturer and test laboratory as to which of these methods to use for the purpose of audit testing. The Administrator will notify the manufacturer at least 30 days prior to any test under this paragraph, and allow the manufacturer and/or his authorized representatives to observe the test.

(3) *Revocation of certification.* (i) If emissions from a central heater tested under paragraph (n)(2) of this section exceed the applicable emission standard by more than 50 percent using the same test method used to obtain certification, the Administrator will notify the manufacturer that certification for that model line is suspended effective 72 hours from the receipt of the notice, unless the suspension notice is withdrawn by the Administrator. The suspension will remain in effect until withdrawn by the Administrator, or the date 30 days from its effective date if a revocation notice under paragraph (n)(3)(ii) of this section is not issued within that period, or the date of final agency action on revocation, whichever occurs earliest.

(ii)(A) If emissions from a central heater tested under paragraph (n)(2) of this section exceed the applicable emission limit, the Administrator will notify the manufacturer that certification is revoked for that model line.

(B) A notice under paragraph (n)(3)(ii)(A) of this section will become final and effective 60 days after the date of written notification to the manufacturer, unless it is withdrawn, a hearing is requested under § 60.5481(a)(2), or the deadline for requesting a hearing is extended.

(C) The Administrator may extend the deadline for requesting a hearing for up to 60 days for good cause.

(D) A manufacturer may extend the deadline for requesting a hearing for up to 6 months, by agreeing to a voluntary suspension of certification.

(iii) Any notification under paragraph (n)(3)(i) or (ii) of this section will include a copy of a preliminary test report from the approved test laboratory or federal test laboratory. The test laboratory must provide a preliminary test report to the Administrator within 14 days of the completion of testing, if a central heater exceeds the applicable emission limit in § 60.5474. The test laboratory must provide the Administrator and the manufacturer, within 30 days of the completion of testing, all documentation pertaining to the test, including the complete test report and raw data sheets, laboratory technician notes, and test results for all test runs.

(iv) Upon receiving notification of a test failure under paragraph (n)(3)(ii) of this section, the manufacturer may request that up to four additional central heaters from the same model line be tested at the manufacturer's expense, at the test laboratory that performed the emissions test for the Administrator.

(v) Whether or not the manufacturer proceeds under paragraph (n)(3)(iv) of this section, the manufacturer may submit any relevant information to the Administrator, including any other test data generated pursuant to this subpart. The manufacturer must bear the expense of any additional testing.

(vi) The Administrator will withdraw any notice issued under paragraph (n)(3)(ii) of this section if tests under paragraph (n)(3)(iv) of this section show either—

(A) That exactly four additional central heaters were tested for the manufacturer and all four met the applicable emission limits; or

(B) That exactly two additional central heaters were tested for the manufacturer and each of them met the applicable emission limits and the average emissions of all three tested heaters (the original audit heater and the two additional heaters) met the applicable emission limits.

(vii) If the Administrator withdraws a notice pursuant to paragraph (n)(3)(vi) of this section, the Administrator will revise the certification values for the model line based on the test data and other relevant information. The manufacturer must then revise the labels and marketing information accordingly.

(viii) The Administrator may withdraw any proposed revocation, if the Administrator finds that an audit test failure has been rebutted by information submitted by the manufacturer under paragraph (n)(3)(iv) of this section and/or (n)(3)(v) of this section or by any other relevant information available to the Administrator.

§ 60.5476 What test methods and procedures must I use to determine compliance with the standards and requirements for certification?

Test methods and procedures specified in this section or in appendices of this part, except as provided under § 60.8(b), must be used to determine compliance with the standards and requirements for certification under §§ 60.5474 and 60.5475 and for reporting carbon monoxide emissions and efficiency. The EPA will post all approved alternative test methods on the EPA Web site. The manufacturer or the manufacturer's authorized representative must submit a summary and the full test report with all supporting information, including detailed discussion of all anomalies, whether all burn rate categories were properly achieved, any data not used in the calculations and, for any test runs not completed, the data that were collected and the reason that the test run was not completed. The burn rate for the low burn rate category must be no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer.

(a) Canadian Standards Administration (CSA) Method B415.1–10, sections 13.7–13.10 (IBR, see § 60.17), must be used to measure the thermal efficiency and CO emissions of outdoor and indoor residential hydronic heaters and forced-air furnaces, except that the burn rates specified in Method 28WHH must be used for hydronic heaters.

(b) Testing conducted with continuously fed biomass as the fuel(s) must be conducted according to the relevant section of the ASTM E2618–13 (IBR, see § 60.17) or adaptations approved by EPA. The EPA will post all approved alternative test methods on the EPA Web site.

(c)(1) For outdoor and indoor residential hydronic heaters to be tested under the 2015 particulate matter emission standards in § 60.5474(b)(1), the manufacturer must have an EPA-approved test laboratory use:

(i) Method 28WHH;

(ii) Method 28WHH PTS;

(iii) ASTM E2618–13 (IBR, see § 60.17) (using crib wood); or

(iv) EN 303–5 (IBR, see § 60.17), only for units sold with thermal storage.

(2) For outdoor and indoor residential hydronic heaters to be tested under the 2020 particulate matter emission standards in § 60.5474(b)(2), the manufacturer must have an EPA-approved test laboratory use:

(i) Method 28WHH;

(ii) Method 28WHH PTS; or

(iii) ASTM E2618–13 (IBR, see § 60.17) (using crib wood).

(3) If the heater is equipped with full or partial heat storage, the manufacturer, retailer and installer must not sell or install the heater with less heat storage capacity than is used in the certification test.

(4) The manufacturer and approved laboratory must make the following adjustments to the methods listed in paragraphs (a), (c)(1) and (2) of this section:

(i) For ASTM E2618–13 (IBR, see § 60.17), the burn rate categories specified in Method 28WHH must be used;

(ii) For EN 303–5 (IBR, see § 60.17), the organic compounds must be included as part of the PM.

(iii) For ASTM 2618–13 (IBR, see § 60.17) Appendix A1 for full thermal storage certification tests, the test must use the large scale as required in the test method unless the manufacturer requests a variance, in advance of testing, contingent upon measuring flue gas temperature, oxygen and CO, using a simple electronic spreadsheet calculator to estimate efficiency and conducting a comparison to the delivered efficiency to determine if a more detailed examination should be made.

(5) For particulate matter emission concentrations measured with ASTM E2515–11 (IBR, see § 60.17), four-inch filters and Teflon membrane filters or Teflon-coated glass fiber filters may be used.

(6) For all tests conducted using ASTM 2515–11 (IBR, see § 60.17) pursuant to this section, the manufacturer and approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel trains. The manufacturer and approved test laboratory must report the test results for the first hour separately and also include them in the total particulate matter emissions per run.

(d)(1) For hydronic heaters subject to the 2020 cord wood alternative compliance option specified in § 60.5474(b)(3), the manufacturers must have the approved laboratory conduct cord wood testing using the test methods listed below:

(i) Method 28WHH;

(ii) Method 28WHH PTS; or

(iii) ASTM E2618–13 (IBR, see § 60.17) (using cord wood).

(2) If the heater is equipped with full or partial heat storage, the manufacturer, retailer and installer must not sell or install the heater with less heat storage capacity than is used in the certification test.

(3) The manufacturer and approved laboratory must make the following adjustments to the methods listed in (d)(1) of this section:

(i) For ASTM E2618–13 (IBR, see § 60.17), use the burn rate categories specified in Method 28WHH;

(ii) For all methods, report the results separately per burn rate category.

(e) For forced-air furnaces, use CSA Method B415.1–10 (IBR, see § 60.17) to measure the heat output (mmBtu/hr) and particulate matter emission rate (lb/mmBtu heat output), except use the burn rate categories in Method 28WHH for the 2020 particulate matter emission standards. For the 2020 particulate matter emission standards, report the particulate matter, efficiency and CO emission results separately per burn rate category.

(f) For affected wood heaters subject to the particulate matter emission standards, emission concentrations must be measured with ASTM E2515–11 (IBR, see § 60.17), except for the 2015 certification tests using EN303–5 (IBR, see § 60.17). As required in paragraph (c)(4)(ii) of this section, the manufacturer and approved laboratory must add the organic gases to the PM for EN 303–5. Four-inch filters and Teflon membrane filters or Teflon-coated glass fiber filters may be used in ASTM E2515–11. Method 5H is not allowed for certification testing.

(g) Douglas fir may be used in ASTM E2618–13 and CSA B415.1–10 (IBR, see § 60.17).

(h) The manufacturer of an affected central heater model line must notify the Administrator of the date that certification testing is to begin, by email, to *WoodHeaterReports@epa.gov*. This notice must be at least 30 days before the start of testing. The notification of testing must include the manufacturer's name and physical and email addresses, the approved test laboratory's name and physical and email addresses, third-party certifier name, the model name and number (or, if unavailable, some other way to distinguish between models), and the dates of testing. The laboratory may substitute certification testing of another affected central heater on the original date in order to ensure regular laboratory testing operations.

(i) The approved test laboratory must allow the manufacturer, the manufacturer's approved third-party certifier, the EPA and delegated state regulatory agencies to observe certification testing. However, manufacturers must not involve themselves in the conduct of the test after the pretest burn has begun.

Communications between the manufacturer and laboratory or third-party certifier personnel regarding operation of the central heater must be limited to written communications transmitted prior to the first pretest burn of the certification series. During certification tests, the manufacturer may communicate with laboratory personnel only in writing and only to notify them that the manufacturer has observed a deviation from proper test procedures. All communications must be included in the test documentation required to be submitted pursuant to § 60.5475(b)(5) and must be consistent with instructions provided in the owner's manual required under § 60.5478(f), except to the extent that they address details of the certification tests that would not be relevant to owners or regulators.

§ 60.5477 What procedures must I use for EPA approval of a test laboratory or EPA approval of a third-party certifier?

(a) *Test laboratory approval.* (1) A laboratory must apply to the Administrator for approval to test under this rule by submitting documentation that the laboratory is accredited by a nationally recognized accrediting entity under ISO–IEC Standard 17025 to perform testing using the test methods specified under § 60.5476. Laboratories accredited by EPA prior to May 15, 2015 may have until May 15, 2018 to submit documentation that they have accreditation under ISO–IEC Standard 17025 to perform testing using the test methods specified under § 60.5476. ISO accreditation is required for all other laboratories performing hydronic heater testing beginning on May 15, 2015, and performing forced-air furnace testing beginning on November 16, 2015.

(2) As part of the application, the test laboratory must:

(i) Agree to participate biennially in an independently operated proficiency testing program with no direct ties to the laboratories participating;

(ii) Agree to allow the Administrator, regulatory agencies and certifying bodies access to observe certification testing;

(iii) Agree to comply with calibration, reporting and recordkeeping requirements that affect testing laboratories; and

(iv) Agree to perform a compliance audit test at the manufacturer's expense at the testing cost normally charged to such manufacturer if the laboratory is selected by the Administrator to conduct the compliance audit test of the manufacturer's model line. The test laboratory must provide a preliminary audit test report to the Administrator within 14 days of the completion of testing, if a central heater exceeds the applicable emission limit in § 60.5474. The test laboratory must provide the Administrator and the manufacturer, within 30 days of the completion of audit testing, all documentation pertaining to the test, including the complete test report and raw data sheets, laboratory technician notes, and test results for all test runs.

(v) Have no conflict of interest and receive no financial benefit from the outcome of certification testing conducted pursuant to § 60.5475.

(vi) Agree to not perform initial certification tests on any models manufactured by a manufacturer for which the laboratory has conducted research and development design services within the last 5 years.

(vii) Agree to seal any wood heater on which it performed certification tests, immediately upon completion or suspension of certification testing, by using a laboratory-specific seal.

(viii) Agree to immediately notify the Administrator of any suspended tests through email and in writing, giving the date suspended, the reason(s) why, and the projected date for restarting. The laboratory must submit the operation and test data obtained, even if the test is not completed.

(3) If the EPA approves the laboratory, the Administrator will provide the test laboratory with a certificate of approval for testing under this rule. If the EPA does not approve the laboratory, the Administrator will give written notice to the laboratory setting forth the basis for the determination.

(b) *Revocation of test laboratory approval.* (1) The Administrator may revoke the EPA laboratory approval if it is determined that the laboratory:

(i) Is no longer accredited by the accreditation body;

(ii) Does not follow required procedures or practices;

(iii) Has falsified data or otherwise misrepresented emission data;

(iv) Failed to participate in a proficiency testing program, in accordance with its commitment under paragraph (a)(2)(i) of this section; or

(v) Failed to seal the central heater in accordance with paragraph (a)(2)(vii) of this section.

(2) Revocation of approval under this paragraph (b) will not take effect until the laboratory concerned has been given written notice by the Administrator setting forth the basis for the proposed determination and an opportunity for a hearing under § 60.5481. However, if revocation is ultimately upheld, all tests conducted by the laboratory after written notice was given will, at the discretion of the Administrator, be declared invalid.

(c) *Period of test laboratory approval.* (1) With the exception of laboratories meeting the provisions of paragraph (c)(2) of this section, and unless revoked sooner, a certificate of approval for testing under this rule is valid for 5 years from the date of issuance.

(2) Laboratories accredited by the EPA by May 15, 2015, under the provisions of § 60.535 as in effect prior to that date may continue to be EPA accredited and deemed EPA approved for testing under this subpart until May 15, 2018, at which time the EPA accreditation and approval ends unless the laboratory has obtained accreditation under § 60.5477 as in effect on that date.

(d) *Third-party certifier approval.* (1) A Third-party certifier may apply to the Administrator for approval to be an EPA-approved third-party certifier by submitting credentials demonstrating that it has been accredited by a nationally recognized accrediting entity to perform certifications and inspections under ISO–IEC Standard 17025, ISO–IEC Standard 17065 and ISO–IEC Standard 17020.

(2) As part of the application, the third-party certifier must:

(i) Agree to offer to contract with central heater manufacturers to perform third-party certification activities according to the requirements set out in this subpart.

(ii) Agree to periodically conduct audits as described in § 60.5475(m) and the manufacturer's quality assurance program;

(iii) Agree to comply with reporting and recordkeeping requirements that affect approved central heater testing laboratories and third-party certifiers;

(iv) Have no conflict of interest and receive no financial benefit from the outcome of certification testing conducted pursuant to § 60.5475;

(v) Agree to make available to the Administrator supporting documentation for each central heater certification and audit; and

(vi) Agree to not perform initial certification reviews on any models manufactured by a manufacturer for which the third-party certifier has conducted research and development design services within the last 5 years.

(3) If approved, the Administrator will provide the third-party certifier with a certificate of approval. The approval will expire 5 years after being issued unless renewed by the third-party certifier. If the EPA denies the approval, the Administrator will give written notice to the third-party certifier for the basis for the determination.

(e) *Revocation of third-party certifier approval.* (1) The Administrator will revoke the third-party certifier's EPA approval if it is determined that the certifier:

(i) Is no longer accredited by the accreditation body;

(ii) Does not follow required procedures or practices; or

(iii) Has falsified certification data or otherwise misrepresented emission data.

(2) Revocation of approval under this paragraph (e) will not take effect until the certifier concerned is given written notice by the Administrator setting forth the basis for the proposed determination and an opportunity for a hearing under § 60.5481. However, if revocation is upheld, all certifications by the certifier after written notice was given will, at the discretion of the Administrator, be declared invalid.

§ 60.5478 What requirements must I meet for permanent labels, temporary labels (hangtags), and owner's manuals?

(a) *General permanent label requirements.* (1) Each affected central heater manufactured or sold on or after the date the applicable standards come into effect as specified in § 60.5474, must have a permanent label affixed to it that meets the requirements of this section.

(2) The permanent label must contain the following information:

(i) Month and year of manufacture of the individual unit;

(ii) Model name and number;

(iii) Certification test emission value, test method, and standard met; and

(iv) Serial number.

(3) The permanent label must:

(i) Be affixed in a readily visible or accessible location in such a manner that it can be easily viewed before and after the appliance is installed (a easily removable façade can be used for aesthetic purposes);

(ii) Be at least 8.9 cm long and 5.1 cm wide (3 1/2 inches long and 2 inches wide);

(iii) Be made of a material expected to last the lifetime of the central heater;

(iv) Present the required information in a manner so that it is likely to remain legible for the lifetime of the central heater; and

(v) Be affixed in such a manner that it cannot be removed without damage to the label.

(4) The permanent label may be combined with any other label, as long as the required information is displayed, the integrity of the permanent label is not compromised, and the permanent label meets the requirements of § 60.5478(a)(3).

(5) Any label statement under paragraph (b) of this section constitutes a representation by the manufacturer as to any central heater that bears it:

(i) That a certification of compliance was in effect at the time the central heater left the possession of the manufacturer;

(ii) That the manufacturer was, at the time the label was affixed, conducting a quality assurance program in conformity with § 60.5475(m); and

(iii) That all the central heaters individually tested for emissions by the manufacturer under its quality assurance program pursuant to § 60.5475(m) met the applicable emissions limit.

(b) *Permanent label requirements for central heaters.* If a central heater belongs to a model line certified under § 60.5475, and no unit in the model line has been found to exceed the applicable emission limits or tolerances through quality assurance testing, one of the following statements, as appropriate, must appear on the permanent label:

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with the 2015 particulate emission standards. Not approved for sale after May 15, 2020" or

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with the 2016 particulate emission standards. Not approved for sale after May 15, 2020" or

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with the 2017 particulate emission standards. Not approved for sale after May 15, 2020" or

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with the 2020 particulate emission standards using crib wood." or

"U.S. ENVIRONMENTAL PROTECTION AGENCY Certified to comply with the 2020 particulate emission standards using cord wood."

(c) *Additional permanent label content.* The permanent label for all certified central heaters must also contain the following statement on the permanent label:

"This appliance needs periodic inspection and repair for proper operation. Consult owner's manual for further information. It is against federal regulations to operate this appliance in a manner inconsistent with operating instructions in the owner's manual."

(d) *Permanent label requirements for affected wood heaters with exemptions under § 60.5472(b).* (1) If an affected central heater is manufactured in the United States for export as provided in § 60.5472(b)(1), the following statement must appear on the permanent label:

"U.S. ENVIRONMENTAL PROTECTION AGENCY Export appliance. May not be sold or operated in the United States."

(2) If an affected central heater is manufactured for use for research and development purposes as provided in § 60.5472(b)(2), the following statement must appear on the permanent label:

"U.S. ENVIRONMENTAL PROTECTION AGENCY Not certified. Research Appliance. Not approved for sale or for operation other than for research."

(3) If an affected central heater is a non wood-burning central heater exclusively as provided in § 60.5472(b)(3), the following statement must appear on the permanent label:

"U.S. ENVIRONMENTAL PROTECTION AGENCY This appliance is not certified for wood burning. Use of any wood fuel is a violation of federal regulations."

(e) *Temporary label (hangtag) voluntary options.* (1) Each model line certified to meet the 2020 particulate emission standards prior to May 15, 2020 may display the hangtags specified in section 3 of Appendix I of this part. The electronic template will be provided by the Administrator upon approval of the certification.

(2) The hangtags in paragraph (e)(1) of this section end upon May 15, 2020.

(3) Each model certified to meet the 2020 Cord Wood Alternative Compliance Option may display the cord wood temporary label specified in section 3 of Appendix I of this part. The electronic template will be provided by the Administrator upon approval of the certification.

(f) *Owner's manual requirements.* (1) Each affected central heater offered for sale by a commercial owner must be accompanied by an owner's manual that must contain the information listed in paragraph (f)(2) of this section (pertaining to installation), and paragraph (f)(3) of this section (pertaining to operation and maintenance). Such information must be adequate to enable consumers to achieve optimal emissions performance. Such information must be consistent with the operating instructions provided by the manufacturer to the approved test laboratory for operating the central heater during certification testing, except for details of the certification test that would not be relevant to the ultimate user. The commercial owner must also make current and historical owner's manuals available on the company Web site and upon request to the EPA.

(2) Guidance on proper installation information, including stack height, heater location and achieving proper draft.

(3) Proper operation and maintenance information, including minimizing visible emissions.

(i) Fuel loading and re-loading procedures, recommendations on fuel selection and warnings on what fuels not to use, such as unseasoned wood, treated wood, colored paper, cardboard, solvents, trash and garbage;

(ii) Fire starting procedures;

(iii) Proper use of air controls, including how to establish good combustion and how to ensure good combustion at the lowest burn rate for which the heater is warranted;

(iv) Ash removal procedures;

(v) Instructions for replacement of gaskets and other parts that are critical to the emissions performance of the unit and other maintenance and repair instructions;

(vi) For catalytic models, information on the following pertaining to the catalytic combustor: Procedures for achieving and maintaining catalyst activity, maintenance procedures, procedures for determining deterioration or failure, procedures for replacement and information on how to exercise warranty rights;

(vii) For catalytic models, the following statement—

''This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed''; and

(viii) For noncatalytic models, the following statement—

''This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.''

(4) Any manufacturer using the EPA-recommended language contained in Appendix I of this part to satisfy any requirement of this paragraph (f) will be considered to be in compliance with that requirement, provided that the particular model language is printed in full, with only such changes as are necessary to ensure accuracy for the particular model line.

(g) Central heaters that are affected by this subpart, but that have been owned and operated by a noncommercial owner, are not subject to paragraphs (e) and (f) of this section when offered for resale.

§ 60.5479 What records must I keep and what reports must I submit?

(a)(1) Each manufacturer who holds a certificate of compliance pursuant to § 60.5475(a)(2) for a model line must maintain records containing the information required by paragraphs (a)(2) through (4) of this section with respect to that model line for at least 5 years.

(2) All documentation pertaining to the certification test used to obtain certification, including the full test report and raw data sheets, laboratory technician notes, calculations, and the test results for all test runs, and discussions of the appropriateness and validity of all test runs, including runs attempted but not completed. The retained certification test documentation must include, as applicable, detailed discussions of all anomalies, whether all burn rate categories were properly achieved, any data not used in the calculations and, for any test runs not completed, the data that were collected and the reason that the test run was not completed. The retained certification test also must include documentation that the burn rate for the low burn category was no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer.

(3) Results of the quality assurance program inspections required pursuant to § 60.5475(m).

(4) For emissions tests conducted pursuant to the quality assurance program required by § 60.5475(m), all test reports, data sheets, laboratory technician notes, calculations, and test results for all test runs, the corrective actions taken, if any, and any follow-up actions such as additional testing.

(b) Each approved test laboratory and third-party certifier must maintain records consisting of all documentation pertaining to each certification test, quality assurance program inspection and audit test, including the full test report and raw data sheets, technician notes, calculations, the test results for all test runs. Each approved test laboratory must submit accreditation credentials and all proficiency test results to the Administrator. Each third-party certifier must submit each certification test, quality assurance program inspection report and ISO-IEC accreditation credentials to the Administrator.

(c) Each manufacturer must retain each central heater upon which certification tests were performed and certification granted under § 60.5475(a)(2) at the manufacturer's facility for 5 years after the certification test. Each central heater must remain sealed and unaltered. Any such central heater must be made available upon request to the Administrator for inspection and testing.

(d) Each manufacturer of an affected central heater model line certified pursuant to § 60.5475(a)(2) must submit a report to the Administrator every 2 years following issuance of a certificate of compliance for each model line. This report must include the sales for each model by state and certify that no changes in the design or manufacture of the model line have been made that require recertification pursuant to § 60.5475(k).

(e)(1) Unless otherwise specified, all records required under this section must be maintained by the manufacturer, commercial owner of the affected central heater, approved test laboratory or third-party certifier for a period of no less than 5 years.

(2) Unless otherwise specified, all reports to the Administrator required under this subpart must be made to: *WoodHeaterReports@epa.gov.*

(f) Within 60 days after the date of completing each performance test (*e.g.,* initial certification test, tests conducted for quality assurance and tests for renewal or recertification), each manufacturer must submit performance test data electronically to *WoodHeaterReports@epa.gov.* Owners or operators who claim that some of the information being submitted for performance tests is CBI (*e.g.,* design drawings) must submit a complete file, including information claimed to be CBI on a compact disk or other commonly used electronic storage media (including, but not limited to, flash drives), by mail, and the same file with the CBI omitted, electronically. The compact disk must be clearly marked as CBI and mailed to U.S. EPA, OECA CBI Office, Attention: Residential Wood Heater Compliance Program, Washington, DC 20004. Emission data and all information necessary to determine compliance, except sensitive engineering drawings and sensitive detailed material specifications, cannot be claimed as CBI.

(g) Within 30 days of receiving a certification of compliance for a model line, the manufacturer must make the full non-CBI test report and the summary of the test report available on the manufacturer's Web site.

(h) Each manufacturer who uses the exemption for R&D heaters under § 60.5472(b)(2) must maintain records for at least 5 years documenting where

the heaters were located, that the heaters were never offered for sale or sold and that the heaters were not used for the purpose of heating.

§ 60.5480 What activities are prohibited under this subpart?

(a) No person is permitted to advertise for sale, offer for sale, sell or operate an affected residential hydronic heater or forced-air furnace or other central heater that does not have affixed to it a permanent label pursuant to § 60.5478(b) through (d), as applicable.

(b) No person is permitted to advertise for sale, offer for sale, or sell an affected central heater labeled under § 60.5478(d)(1) except for export. No person is permitted to operate an affected central heater in the United States if it is labeled under § 60.5478(d)(1).

(c)(1) No commercial owner is permitted to advertise for sale, offer for sale, or sell an affected central heater permanently labeled under § 60.5478(b) unless:

(i) The affected appliance has been certified to comply with the particulate emission standards pursuant to § 60.5474 as applicable; and

(ii) The commercial owner provides any purchaser or transferee with an owner's manual that meets the requirements of § 60.5478(f), a copy of the warranty and a moisture meter.

(2) A commercial owner other than a manufacturer complies with the requirements of paragraph (c)(1) of this section if the commercial owner:

(i) Receives the required documentation from the manufacturer or a previous commercial owner; and

(ii) Provides that documentation unaltered to any person to whom the central heater that it covers is sold or transferred.

(d)(1) In any case in which the Administrator revokes a certificate of compliance either for the knowing submission of false or inaccurate information or other fraudulent acts, or based on a finding under § 60.5475(l)(1)(ii) that the certification test was not valid, the Administrator may give notice of that revocation and the grounds for it to all commercial owners.

(2) On and after the date of receipt of the notice given under paragraph (d)(1) of this section, no commercial owner is permitted to sell any central heater covered by the revoked certificate (other than to the manufacturer) unless the model line has been recertified in accordance with this subpart.

(e) No person is permitted to install or operate an affected central heater except in a manner consistent with the instructions on its permanent label and in the owner's manual pursuant to § 60.5478(f), including only using fuels for which the unit is certified.

(f) No person is permitted to operate, sell or offer for sale an affected central heater that was originally equipped with a catalytic combustor if the catalytic element is deactivated or removed.

(g) No person is permitted to operate, sell or offer for sale an affected central heater that has been physically altered to exceed the tolerance limits of its certificate of compliance, pursuant to § 60.5475(k).

(h) No person is permitted to alter, deface, or remove any permanent label required to be affixed pursuant to § 60.5478(a) through (d), as applicable.

(i) If a temporary label is affixed to the central heater, retailers may not sell or offer for sale that central heater unless the temporary label affixed is in accordance with § 60.5478(e), as applicable.

§ 60.5481 What hearing and appeal procedures apply to me?

(a)(1) The affected manufacturer, laboratory or third-party certifier may request a hearing under this section within 30 days following receipt of the required notification in any case where the Administrator—

(i) Denies an application for a certificate of compliance under § 60.5475 (a)(2);

(ii) Denies an application for a renewal of certification under § 60.5475(i);

(iii) Issues a notice of revocation of certification under § 60.5475(l);

(iv) Denies an application for laboratory approval under § 60.5477(a);

(v) Issues a notice of revocation of laboratory approval under § 60.5477(b).

(vi) Denies an application for third-party certifier approval under § 60.5477(d); or

(vii) Issues a notice of revocation of third-party certifier approval under § 60.5477(e).

(2) In any case where the Administrator issues a notice of revocation under § 60.5475(n)(3)(ii), the manufacturer may request a hearing under this section with the time limits set out in § 60.5475(n)(3)(ii).

(b) Any hearing request must be in writing, must be signed by an authorized representative of the petitioning manufacturer or laboratory, and must include a statement setting forth with particularity the petitioner's objection to the Administrator's determination or proposed determination.

(c)(1) Upon receipt of a request for a hearing under paragraph (a) of this section, the Administrator will request the Chief Administrative Law Judge to designate an Administrative Law Judge as Presiding Officer for the hearing. If the Chief Administrative Law Judge replies that no Administrative Law Judge is available to perform this function, the Administrator will designate a Presiding Officer who has not had any prior responsibility for the matter under review, and who is not subject to the direct control or supervision of someone who has had such responsibility.

(2) The hearing will commence as soon as practicable at a time and place fixed by the Presiding Officer.

(3)(i) A motion for leave to intervene in any proceeding conducted under this section must set forth the grounds for the proposed intervention, the position and interest of the movant and the likely impact that intervention will have on the expeditious progress of the proceeding. Any person already a party to the proceeding may file an answer to a motion to intervene, making specific reference to the factors set forth in the foregoing sentence and paragraph (c)(3)(iii) of this section within 10 days after service of the motion for leave to intervene.

(ii) A motion for leave to intervene in a proceeding must ordinarily be filed before the first prehearing conference or, in the absence of a prehearing conference, prior to the setting of a time and place for a hearing. Any motion filed after that time must include, in addition to the information set forth in paragraph (c)(3)(i) of this section, a statement of good cause for the failure to file in a timely manner. The intervener shall be bound by any agreements, arrangements and other matters previously made in the proceeding.

(iii) A motion for leave to intervene may be granted only if the movant demonstrates that his presence in the proceeding would not unduly prolong or otherwise prejudice the adjudication of the rights of the original parties, and that movant may be adversely affected by a final order. The intervener will become a full party to the proceeding upon the granting of leave to intervene.

(iv) Persons not parties to the proceeding may move for leave to file amicus curiae briefs. The movant must state his interest and the reasons why the proposed amicus brief is desirable. If the motion is granted, the Presiding Officer or Administrator will issue an order setting the time for filing such brief. An amicus curia may participate in any briefing after his motion is granted, and will be served with all

briefs, reply briefs, motions, and orders relating to issues to be briefed.

(4) In computing any period of time prescribed or allowed in this subpart, the day of the event from which the designated period begins to run will not be included. Saturdays, Sundays, and federal legal holidays will be included. When a stated time expires on a Saturday, Sunday or legal holiday, the stated time period will be extended to include the next business day.

(d)(1) Upon his appointment the Presiding Officer must establish a hearing file. The file will consist of the notice issued by the Administrator under §§ 60.5475(c)(2), 60.5475(f)(3), 60.5475(i)(4), 60.5475(l)(2), 60.5475(n)(3)(ii)(A), 60.5477(a)(3), 60.5477(b)(2), 60.5477(d)(3) or 60.5477(e)(2), together with any accompanying material, the request for a hearing and the supporting data submitted therewith, and all documents relating to the request for certification or approval, or the proposed revocation of either.

(2) The hearing file must be available for inspection by any party, to the extent authorized by law, at the office of the Presiding Officer, or other place designated by him.

(e) Any party may appear in person, or may be represented by counsel or by any other duly authorized representative.

(f)(1) The Presiding Officer, upon the request of any party, or at his discretion, may order a prehearing conference at a time and place specified by him to consider the following:

(i) Simplification of the issues;

(ii) Stipulations, admissions of fact, and the introduction of documents;

(iii) Limitation of the number of expert witnesses;

(iv) Possibility of agreement disposing of all or any of the issues in dispute; and

(v) Such other matters as may aid in the disposition of the hearing, including such additional tests as may be agreed upon by the parties.

(2) The results of the conference must be reduced to writing by the Presiding Officer and made part of the record.

(g)(1) Hearings shall be conducted by the Presiding Officer in an informal but orderly and expeditious manner. The parties may offer oral or written evidence, subject to the exclusion by the Presiding Officer of irrelevant, immaterial and repetitious evidence.

(2) Witnesses will not be required to testify under oath. However, the Presiding Officer will call to the attention of witnesses that their statements may be subject to penalties under title 18 U.S.C. 1001 for knowingly making false statements or representations or using false documents in any matter within the jurisdiction of any department or agency of the United States.

(3) Any witness may be examined or cross-examined by the Presiding Officer, the parties, or their representatives.

(4) Hearings must be recorded verbatim. Copies of transcripts of proceedings may be purchased by the applicant from the reporter.

(5) All written statements, charts, tabulations and similar data offered in evidence at the hearings must, upon a showing satisfactory to the Presiding Officer of their authenticity, relevancy and materiality, be received in evidence and will constitute a part of the record.

(h)(1) The Presiding Officer will make an initial decision which must include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the record. The findings, conclusions and written decision must be provided to the parties and made a part of the record. The initial decision will become the decision of the Administrator without further proceedings unless there is an appeal to the Administrator or motion for review by the Administrator. Except as provided in paragraph (h)(3) of this section, any such appeal must be taken within 20 days of the date the initial decision was filed.

(2) On appeal from or review of the initial decision the Administrator will have all the powers which he would have in making the initial decision including the discretion to require or allow briefs, oral argument, the taking of additional evidence or the remanding to the Presiding Officer for additional proceedings. The decision by the Administrator must include written findings and conclusions and the reasons or basis therefor on all the material issues of fact, law, or discretion presented on the appeal or considered in the review.

(3) In any hearing requested under paragraph (a)(2) of this section the Presiding Officer must render the initial decision within 60 days of that request. Any appeal to the Administrator must be taken within 10 days of the initial decision, and the Administrator must render a decision in that appeal within 30 days of the filing of the appeal.

§ 60.5482 Who implements and enforces this subpart?

(a) Under section 111(c) of the Clean Air Act, the Administrator may delegate the following implementation and enforcement authority to a state, local or tribal authority upon request:

(1) Enforcement of prohibitions on the installation and operation of affected central heaters in a manner inconsistent with the installation and owner's manual;

(2) Enforcement of prohibitions on operation of catalytic central heaters where the catalyst has been deactivated or removed;

(3) Enforcement of prohibitions on advertisement and/or sale of uncertified model lines;

(4) Enforcement of prohibitions on advertisement and/or sale of affected central heaters that do not have required permanent label;

(5) Enforcement of proper labeling of affected central heaters;

(6) Enforcement of compliance with other labeling requirements for affected central heaters.

(7) Enforcement of certification testing procedures;

(8) Enforcement of requirements for sealing of the tested central heaters and meeting parameter limits; and

(9) Enforcement of compliance requirements of EPA-approved laboratories.

(b) Delegations shall not include:

(1) Decisions on certification;

(2) Revocation of certification;

(3) Establishment or revision of standards;

(4) Establishment or revision of test methods;

(5) Laboratory and third-party certifier approvals and revocations;

(6) Enforcing provisions governing content of owner's manuals; and

(7) Hearings and appeals procedures.

(c) Nothing in these delegations will prohibit the Administrator from enforcing any applicable requirements.

(d) Nothing in these delegations will limit delegated entities from using their authority under section 116 of the Clean Air Act to adopt or enforce more restrictive requirements.

§ 60.5483 What parts of the General Provisions do not apply to me?

The following provisions of subpart A of part 60 do not apply to this subpart:

(a) Section 60.7;

(b) Section 60.8(a), (c), (d), (e), (f) and (g); and

(c) Section 60.15(d).

■ 6. Part 60 Appendix A–8 is amended by adding Test Methods 28R, 28WHH, and 28WHH–PTS to follow Test Method 28A to read as follows:

Appendix A–8 to Part 60—Test Methods 26 through 30B

* * * * *

Test Method 28R for Certification and Auditing of Wood Heaters

1.0 Scope and Application

1.1 This test method applies to certification and auditing of wood-fired room heaters and fireplace inserts.

1.2 The test method covers the fueling and operating protocol for measuring particulate emissions, as well as determining burn rates, heat output and efficiency.

1.3 Particulate emissions are measured by the dilution tunnel method as specified in ASTM E2515–11 *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel* (IBR, see § 60.17). Upon request, four-inch filters may be used. Upon request, Teflon membrane filters or Teflon-coated glass fiber filters may be used.

2.0 Procedures

2.1 This method incorporates the provisions of ASTM E2780–10 (IBR, see § 60.17) except as follows:

2.1.1 The burn rate categories, low burn rate requirement, and weightings in Method 28 shall be used.

2.1.2 The startup procedures shall be the same as in Method 28.

2.1.3 Manufacturers shall not specify a smaller volume of the firebox for testing than the full usable firebox.

2.1.4 Prior to testing, the heater must be operated for a minimum of 50 hours using a medium burn rate. The conditioning may be at the manufacturer's facility prior to the certification test. If the conditioning is at the certification test laboratory, the pre-burn for the first test can be included as part of the conditioning requirement.

2.2 Manufacturers may use ASTM E871–82 (reapproved 2013) (IBR, see § 60.17) as an alternative to the procedures in Method 5H or Method 28 for determining total weight basis moisture in the analysis sample of particulate wood fuel.

Test Method 28WHH for Measurement of Particulate Emissions and Heating Efficiency of Wood-Fired Hydronic Heating Appliances

1.0 Scope and Application

1.1 This test method applies to wood-fired hydronic heating appliances. The units typically transfer heat through circulation of a liquid heat exchange media such as water or a water-antifreeze mixture.

1.2 The test method measures particulate emissions and delivered heating efficiency at specified heat output rates based on the appliance's rated heating capacity.

1.3 Particulate emissions are measured by the dilution tunnel method as specified in ASTM E2515–11 *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel* (IBR, see § 60.17). Upon request, four-inch filters may be used. Upon request, Teflon membrane filters or Teflon-coated glass fiber filters may be used. Delivered efficiency is measured by determining the heat output through measurement of the flow rate and temperature change of water circulated through a heat exchanger external to the appliance and determining the input from the mass of dry wood fuel and its higher heating value. Delivered efficiency does not attempt to account for pipeline loss.

1.4 Products covered by this test method include both pressurized and non-pressurized heating appliances intended to be fired with wood. These products are wood-fired hydronic heating appliances that the manufacturer specifies for indoor or outdoor installation. They are often connected to a heat exchanger by insulated pipes and normally include a pump to circulate heated liquid. They are used to heat structures such as homes, barns and greenhouses and can heat domestic hot water, spas or swimming pools.

1.5 Distinguishing features of products covered by this standard include:

1.5.1 Manufacturer specifies for indoor or outdoor installation.

1.5.2 A firebox with an access door for hand loading of fuel.

1.5.3 Typically, an aquastat that controls combustion air supply to maintain the liquid in the appliance within a predetermined temperature range provided sufficient fuel is available in the firebox.

1.5.4 A chimney or vent that exhausts combustion products from the appliance.

1.6 The values stated are to be regarded as the standard whether in I–P or SI units. The values given in parentheses are for information only.

2.0 Summary of Method and References

2.1 Particulate matter emissions are measured from a wood-fired hydronic heating appliance burning a prepared test fuel crib in a test facility maintained at a set of prescribed conditions. Procedures for determining burn rates, and particulate emissions rates and for reducing data are provided.

2.2 Referenced Documents

2.2.1 EPA Standards

2.2.1.1 Method 28 Certification and Auditing of Wood Heaters

2.2.2 Other Standards

2.2.2.1 ASTM E2515–11—*Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel* (IBR, see § 60.17).

2.2.2.2 CSA–B415.1–10 *Performance Testing of Solid-Fuel-Burning Heating Appliances* (IBR, see § 60.17).

3.0 Terminology

3.1 Definitions.

3.1.1 Hydronic Heating—A heating system in which a heat source supplies energy to a liquid heat exchange media such as water that is circulated to a heating load and returned to the heat source through pipes.

3.1.2 Aquastat—A control device that opens or closes a circuit to control the rate of fuel consumption in response to the temperature of the heating media in the heating appliance.

3.1.3 Delivered Efficiency—The percentage of heat available in a test fuel charge that is delivered to a simulated heating load as specified in this test method.

3.1.4 Manufacturer's Rated Heat Output Capacity—The value in Btu/hr (MJ/hr) that the manufacturer specifies that a particular model of hydronic heating appliance is capable of supplying at its design capacity as verified by testing, in accordance with Section 13.

3.1.5 Burn Rate—The rate at which test fuel is consumed in an appliance. Measured in pounds (lbs) or kilograms of wood (dry basis) per hour (lb/hr or kg/hr).

3.1.6 Firebox—The chamber in the appliance in which the test fuel charge is placed and combusted.

3.1.7 Test Fuel Charge—The collection of test fuel layers placed in the appliance at the start of the emission test run.

3.1.8 Test Fuel Layer—Horizontal arrangement of test fuel units.

3.1.9 Test Fuel Unit—One or more test fuel pieces with ¾ inch (19 mm) spacers attached to the bottom and to one side. If composed of multiple test fuel pieces, the bottom spacer may be one continuous piece.

3.1.10 Test Fuel Piece—A single 4 x 4 (4 ± 0.25 inches by 4 ± 0.25 inches) [100 ± 6 mm by 100 ± 6 mm] white or red oak wood piece cut to the length required.

3.1.11 Test Run—An individual emission test that encompasses the time required to consume the mass of the test fuel charge.

3.1.12 Overall Efficiency (SLM)—The efficiency for each test run as determined using the CSA B415.1–10 (IBR, see § 60.17) stack loss method.

3.1.13 Thermopile—A device consisting of a number of thermocouples connected in series, used for measuring differential temperature.

4.0 Summary of Test Method

4.1 Dilution Tunnel. Emissions are determined using the ''dilution tunnel'' method specified in ASTM E2515–11 *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel* (IBR, see § 60.17). The flow rate in the dilution tunnel is maintained at a constant level throughout the test cycle and accurately measured. Samples of the dilution tunnel flow stream are extracted at a constant flow rate and drawn through high efficiency filters. The filters are dried and weighed before and after the test to determine the emissions catch and this value is multiplied by the ratio of tunnel flow to filter flow to determine the total particulate emissions produced in the test cycle.

4.2 Efficiency. The efficiency test procedure takes advantage of the fact that this type of appliance delivers heat through circulation of the heated liquid (water) from the appliance to a remote heat exchanger and back to the appliance. Measurements of the water temperature difference as it enters and exits the heat exchanger along with the measured flow rate allow for an accurate determination of the useful heat output of the appliance. The input is determined by weight of the test fuel charge, adjusted for moisture content, multiplied by the higher heating value. Additional measurements of the appliance weight and temperature at the beginning and end of a test cycle are used to correct for heat stored in the appliance. Overall efficiency (SLM) is determined using the CSA B415.1–10 (IBR, see § 60.17) stack loss method for data quality assurance purposes.

4.3 Operation. Appliance operation is conducted on a hot-to-hot test cycle meaning

that the appliance is brought to operating temperature and a coal bed is established prior to the addition of the test fuel charge and measurements are made for each test fuel charge cycle. The measurements are made under constant heat draw conditions within predetermined ranges. No attempt is made to modulate the heat demand to simulate an indoor thermostat cycling on and off in response to changes in the indoor environment. Four test categories are used. These are:

4.3.1 Category I: A heat output of 15 percent or less of manufacturer's rated heat output capacity.

4.3.2 Category II: A heat output of 16 percent to 24 percent of manufacturer's rated heat output capacity.

4.3.3 Category III: A heat output of 25 percent to 50 percent of manufacturer's rated heat output capacity.

4.3.4 Category IV: Manufacturer's rated heat output capacity.

5.0 Significance and Use

5.1 The measurement of particulate matter emission rates is an important test method widely used in the practice of air pollution control.

5.1.1 These measurements, when approved by state or federal agencies, are often required for the purpose of determining compliance with regulations and statutes.

5.1.2 The measurements made before and after design modifications are necessary to demonstrate the effectiveness of design changes in reducing emissions and make this standard an important tool in manufacturers' research and development programs.

5.2 Measurement of heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to the useful heat production.

5.3 This is a laboratory method and is not intended to be fully representative of all actual field use. It is recognized that users of hand-fired, wood-burning equipment have a great deal of influence over the performance of any wood-burning appliance. Some compromises in realism have been made in the interest of providing a reliable and repeatable test method.

6.0 Test Equipment

6.1 Scale. A platform scale capable of weighing the appliance under test and associated parts and accessories when completely filled with water to an accuracy of ±1.0 pound (±0.5 kg).

6.2 Heat Exchanger. A water-to-water heat exchanger capable of dissipating the expected heat output from the system under test.

6.3 Water Temperature Difference Measurement. A Type—T 'special limits' thermopile with a minimum of 5 pairs of junctions shall be used to measure the temperature difference in water entering and leaving the heat exchanger. The temperature difference measurement uncertainty of this type of thermopile is equal to or less than ±0.50 °F (±0.25 °C). Other temperature measurement methods may be used if the temperature difference measurement uncertainty is equal to or less than ±0.50 °F (±0.25 °C).

6.4 Water Flow Meter. A water flow meter shall be installed in the inlet to the load side of the heat exchanger. The flow meter shall have an accuracy of ±1 percent of measured flow.

6.4.1 Optional—Appliance Side Water Flow Meter. A water flow meter with an accuracy of ±1 percent of the flow rate is recommended to monitor supply side water flow rate.

6.5 Optional Recirculation Pump. Circulating pump used during test to prevent stratification of liquid being heated.

6.6 Water Temperature Measurement—Thermocouples or other temperature sensors to measure the water temperature at the inlet and outlet of the load side of the heat exchanger. Must meet the calibration requirements specified in section 10.1.

6.7 Wood Moisture Meter—Calibrated electrical resistance meter capable of measuring test fuel moisture to within 1 percent moisture content. Must meet the calibration requirements specified in section 10.4.

6.8 Flue Gas Temperature Measurement—Must meet the requirements of CSA B415.1–10 (IBR, see § 60.17), clause 6.2.2.

6.9 Test Room Temperature Measurement—Must meet the requirements of CSA B415.1–10 (IBR, see § 60.17), clause 6.2.1.

6.10 Flue Gas Composition Measurement—Must meet the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 6.3.1 through 6.3.3.

7.0 Safety

7.1 These tests involve combustion of wood fuel and substantial release of heat and products of combustion. The heating system also produces large quantities of very hot water and the potential for steam production and system pressurization. Appropriate precautions must be taken to protect personnel from burn hazards and respiration of products of combustion.

8.0 Sampling, Test Specimens and Test Appliances

8.1 Test specimens shall be supplied as complete appliances including all controls and accessories necessary for installation in the test facility. A full set of specifications and design and assembly drawings shall be provided when the product is to be placed under certification of a third-party agency. The manufacturer's written installation and operating instructions are to be used as a guide in the set-up and testing of the appliance.

9.0 Preparation of Test Equipment

9.1 The appliance is to be placed on a scale capable of weighing the appliance fully loaded with a resolution of ±1.0 lb (0.5 kg).

9.2 The appliance shall be fitted with the type of chimney recommended or provided by the manufacturer and extending to 15 ±0.5 feet (4.6 ±0.15 m) from the upper surface of the scale. If no flue or chimney system is recommended or provided by the manufacturer, connect the appliance to a flue of a diameter equal to the flue outlet of the appliance. The flue section from the appliance flue collar to 8 ±0.5 feet above the scale shall be single wall stove pipe and the remainder of the flue shall be double wall insulated class A chimney.

9.3 Optional Equipment Use

9.3.1 A recirculation pump may be installed between connections at the top and bottom of the appliance to minimize thermal stratification if specified by the manufacturer. The pump shall not be installed in such a way as to change or affect the flow rate between the appliance and the heat exchanger.

9.3.2 If the manufacturer specifies that a thermal control valve or other device be installed and set to control the return water temperature to a specific set point, the valve or other device shall be installed and set per the manufacturer's written instructions.

9.4 Prior to filling the tank, weigh and record the appliance mass.

9.5 Heat Exchanger

9.5.1 Plumb the unit to a water-to-water heat exchanger with sufficient capacity to draw off heat at the maximum rate anticipated. Route hoses, electrical cables, and instrument wires in a manner that does not influence the weighing accuracy of the scale as indicated by placing dead weights on the platform and verifying the scale's accuracy.

9.5.2 Locate thermocouples to measure the water temperature at the inlet and outlet of the load side of the heat exchanger.

9.5.3 Install a thermopile meeting the requirements of section 6.3 to measure the water temperature difference between the inlet and outlet of the load side of the heat exchanger.

9.5.4 Install a calibrated water flow meter in the heat exchanger load side supply line. The water flow meter is to be installed on the cooling water inlet side of the heat exchanger so that it will operate at the temperature at which it is calibrated.

9.5.5 Place the heat exchanger in a box with 2 in. (50 mm) of expanded polystyrene (EPS) foam insulation surrounding it to minimize heat losses from the heat exchanger.

9.5.6 The reported efficiency and heat output rate shall be based on measurements made on the load side of the heat exchanger.

9.5.7 Temperature instrumentation per section 6.6 shall be installed in the appliance outlet and return lines. The average of the outlet and return water temperature on the supply side of the system shall be considered the average appliance temperature for calculation of heat storage in the appliance (TF_{avg} and TI_{avg}). Installation of a water flow meter in the supply side of the system is optional.

9.6 Fill the system with water. Determine the total weight of the water in the appliance when the water is circulating. Verify that the scale indicates a stable weight under operating conditions. Make sure air is purged properly.

10.0 Calibration and Standardization

10.1 Water Temperature Sensors. Temperature measuring equipment shall be calibrated before initial use and at least semi-annually thereafter. Calibrations shall be in

compliance with National Institute of Standards and Technology (NIST) Monograph 175, Standard Limits of Error.

10.2 Heat Exchanger Load Side Water Flow Meter.

10.2.1 The heat exchanger load side water flow meter shall be calibrated within the flow range used for the test run using NIST traceable methods. Verify the calibration of the water flow meter before and after each test run and at least once during each test run by comparing the water flow rate indicated by the flow meter to the mass of water collected from the outlet of the heat exchanger over a timed interval. Volume of the collected water shall be determined based on the water density calculated from section 13, Eq. 8, using the water temperature measured at the flow meter. The uncertainty in the verification procedure used shall be 1 percent or less. The water flow rate determined by the collection and weighing method shall be within 1 percent of the flow rate indicated by the water flow meter.

10.3 Scales. The scales used to weigh the appliance and test fuel charge shall be calibrated using NIST traceable methods at least once every 6 months.

10.4 Moisture Meter. The moisture meter shall be calibrated per the manufacturer's instructions and checked before each use.

10.5 Flue Gas Analyzers—In accordance with CSA B415.1–10 (IBR, see § 60.17), clause 6.8.

11.0 Conditioning

11.1 Prior to testing, the appliance is to be operated for a minimum of 50 hours using a medium heat draw rate. The conditioning may be at the manufacturer's facility prior to the certification test. If the conditioning is at the certification test laboratory, the pre-burn for the first test can be included as part of the conditioning requirement. If conditioning is included in pre-burn, then the appliance shall be aged with fuel meeting the specifications outlined in sections 12.2 with a moisture content between 19 and 25 percent on a dry basis. Operate the appliance at a medium burn rate (Category II or III) for at least 10 hours for noncatalytic appliances and 50 hours for catalytic appliances. Record and report hourly flue gas exit temperature data and the hours of operation. The aging procedure shall be conducted and documented by a testing laboratory.

12.0 Procedure

12.1 Appliance Installation. Assemble the appliance and parts in conformance with the manufacturer's written installation instructions. Clean the flue with an appropriately sized, wire chimney brush before each certification test series.

12.2 Fuel. Test fuel charge fuel shall be red (*Quercus ruba L.*) or white (*Quercus alba*) oak 19 to 25 percent moisture content on a dry basis. Piece length shall be 80 percent of the firebox depth rounded down to the nearest 1 inch (25mm) increment. For example, if the firebox depth is 46 inches (1168mm) the 4 x 4 piece length would be 36 inches (46 inches $\times$ 0.8 = 36.8 inches rounded down to 36 inches). Pieces are to be placed in the firebox parallel to the longest firebox dimension. For fireboxes with sloped surfaces that create a non-uniform firebox length, the piece length shall be adjusted for each layer based on 80 percent of the length at the level where the layer is placed. Pieces are to be spaced ¾ inches (19 mm) apart on all faces. The first fuel layer may be assembled using fuel units consisting of multiple 4 x 4s consisting of single pieces with bottom and side spacers of 3 or more pieces if needed for a stable layer. The second layer may consist of fuel units consisting of no more than two pieces with spacers attached on the bottom and side. The top two layers of the fuel charge must consist of single pieces unless the fuel charge is only three layers. In that instance only the top layer must consist of single units. Three-quarter inch (19 mm) by 1.5 inch (38 mm) spacers shall be attached to the bottom of piece to maintain a ¾ inch (19 mm) separation. When a layer consists of two or more units of 4 x 4s an additional ¾ inch (19 mm) thick by 1.5 inch (38 mm) wide spacer shall be attached to the vertical face of each end of one 4 x 4, such that the ¾ inch (19 mm) space will be maintained when two 4 x 4 units or pieces are loaded side by side. In cases where a layer contains an odd number of 4 x 4s one piece shall not be attached, but shall have spacers attached in a manner that will provide for the ¾ inch (19 mm) space to be maintained (See Figure 1). Spacers shall be attached perpendicular to the length of the 4 x 4s such that the edge of the spacer is 1 ± 0.25 inch from the end of the 4 x 4s in the previous layers. Spacers shall be red or white oak and will be attached with either nails (non-galvanized), brads or oak dowels. The use of kiln-dried wood is not allowed.

12.2.1 Using a fuel moisture meter as specified in section 6.7 of the test method, determine the fuel moisture for each test fuel piece used for the test fuel load by averaging at least five fuel moisture meter readings measured parallel to the wood grain. Penetration of the moisture meter insulated electrodes for all readings shall be ¼ the thickness of the fuel piece or 19 mm (¾ in.), whichever is lesser. One measurement from each of three sides shall be made at approximately 3 inches from each end and the center. Two additional measurements shall be made centered between the other three locations. Each individual moisture content reading shall be in the range of 18 to 28 percent on a dry basis. The average moisture content of each piece of test fuel shall be in the range of 19 to 25 percent. It is not required to measure the moisture content of the spacers. Moisture shall not be added to previously dried fuel pieces except by storage under high humidity conditions and temperature up to 100 °F. Fuel moisture shall be measured within 4 hours of using the fuel for a test.

12.2.2 Firebox Volume. Determine the firebox volume in cubic feet. Firebox volume shall include all areas accessible through the fuel loading door where firewood could reasonably be placed up to the horizontal plane defined by the top of the loading door. A drawing of the firebox showing front, side and plan views or an isometric view with interior dimensions shall be provided by the manufacturer and verified by the laboratory. Calculations for firebox volume from computer aided design (CAD) software programs are acceptable and shall be included in the test report if used. If the firebox volume is calculated by the laboratory the firebox drawings and calculations shall be included in the test report.

12.2.3 Test Fuel Charge. Test fuel charges shall be determined by multiplying the firebox volume by 10 pounds (4.54 kg) per ft^3 (28L), or a higher load density as recommended by the manufacturer's printed operating instructions, of wood (as used wet weight). Select the number of pieces of standard fuel that most nearly match this target weight. This is the standard fuel charge for all tests. For example, if the firebox loading area volume is 10 ft^3 (280L) and the firebox depth is 46 inches (1168 mm), test fuel charge target is 100 lbs (45 kg) minimum and the piece length is 36 inches (914 mm). If eight 4 x 4s, 36 inches long weigh 105 lbs (48 kg), use 8 pieces for each test fuel charge. All test fuel charges will be of the same configuration.

12.3 Sampling Equipment. Prepare the particulate emission sampling equipment as defined by ASTM E2515–11 *Standard Test Method for Determination of Particulate Matter Emissions Collected in a Dilution Tunnel* (IBR, see § 60.17). Upon request, four-inch filters may be used. Upon request, Teflon membrane filters or Teflon-coated glass fiber filters may be used.

12.4 Appliance Startup. The appliance shall be fired with wood fuel of any species, size and moisture content at the laboratories' discretion to bring it up to operating temperature. Operate the appliance until the water is heated to the upper operating control limit and has cycled at least two times. Then remove all unburned fuel, zero the scale and verify the scales accuracy using dead weights.

12.4.1 Pretest Burn Cycle. Reload appliance with oak wood and allow it to burn down to the specified coal bed weight. The pretest burn cycle fuel charge weight shall be within ± 10 percent of the test fuel charge weight. Piece size and length shall be selected such that charcoalization is achieved by the time the fuel charge has burned down to the required coal bed weight. Pieces with a maximum thickness of approximately 2 inches have been found to be suitable. Charcoalization is a general condition of the test fuel bed evidenced by an absence of large pieces of burning wood in the coal bed and the remaining fuel pieces being brittle enough to be broken into smaller charcoal pieces with a metal poker. Manipulations to the fuel bed prior to the start of the test run are to be done to achieve charcoalization while maintaining the desired heat output rate. During the pre-test burn cycle and at least one hour prior to starting the test run, adjust water flow to the heat exchanger to establish the target heat draw for the test. For the first test run the heat draw rate shall be equal to the manufacturer's rated heat output capacity.

12.4.1.1 Allowable Adjustments. Fuel addition or subtractions, and coal bed raking shall be kept to a minimum but are allowed up to 15 minutes prior to the start of the test

run. For the purposes of this method, coal bed raking is the use of a metal tool (poker) to stir coals, break burning fuel into smaller pieces, dislodge fuel pieces from positions of poor combustion, and check for the condition of charcoalization. Record all adjustments to and additions or subtractions of fuel, and any other changes to the appliance operations that occur during pretest ignition period. During the 15-minute period prior to the start of the test run, the wood heater loading door shall not be open more than a total of 1 minute. Coal bed raking is the only adjustment allowed during this period.

12.4.2 Coal Bed Weight. The appliance is to be loaded with the test fuel charge when the coal bed weight is between 10 percent and 20 percent of the test fuel charge weight. Coals may be raked as necessary to level the coal bed but may only be raked and stirred once between 15 to 20 minutes prior to the addition of the test fuel charge.

12.5 Test Runs. For all test runs, the return water temperature to the hydronic heater must be equal to or greater than 120 °F. Aquastat or other heater output control device settings that are adjustable shall be set using manufacturer specifications, either as factory set or in accordance with the owner's manual, and shall remain the same for all burn categories.

Complete a test run in each heat output rate category, as follows:

12.5.1 Test Run Start. Once the appliance is operating normally and the pretest coal bed weight has reached the target value per section 12.4.2, tare the scale and load the full test charge into the appliance. Time for loading shall not exceed 5 minutes. The actual weight of the test fuel charge shall be measured and recorded within 30 minutes prior to loading. Start all sampling systems.

12.5.1.1 Record all water temperatures, differential water temperatures and water flow rates at time intervals of one minute or less.

12.5.1.2 Record particulate emissions data per the requirements of ASTM E2515 (IBR, see § 60.17).

12.5.1.3 Record data needed to determine overall efficiency (SLM) per the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 6.2.1, 6.2.2, 6.3, 8.5.7, 10.4.3 (a), 10.4.3(f), and 13.7.9.3

12.5.1.3.1 Measure and record the test room air temperature in accordance with the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 6.2.1, 8.5.7 and 10.4.3 (g).

12.5.1.3.2 Measure and record the flue gas temperature in accordance with the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 6.2.2, 8.5.7 and 10.4.3 (f).

12.5.1.3.3 Determine and record the carbon monoxide (CO) and carbon dioxide (CO_2) concentrations in the flue gas in accordance with CSA B415.1–10 (IBR, see § 60.17), clauses 6.3, 8.5.7 and 10.4.3 (i) and (j).

12.5.1.3.4 Measure and record the test fuel weight per the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 8.5.7 and 10.4.3 (h).

12.5.1.3.5 Record the test run time per the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 10.4.3 (a).

12.5.1.4 Monitor the average heat output rate on the load side of the heat exchanger. If the heat output rate gets close to the upper or lower limit of the target range (±5 percent) adjust the water flow through the heat exchanger to compensate. Make changes as infrequently as possible while maintaining the target heat output rate. The first test run shall be conducted at the Category IV heat output rate to validate that the appliance is capable of producing the manufacturer's rated heat output capacity.

12.5.2 Test Fuel Charge Adjustment. It is acceptable to adjust the test fuel charge (*i.e.*, reposition) once during a test run if more than 60 percent of the initial test fuel charge weight has been consumed and more than 10 minutes have elapsed without a measurable (1 lb or 0. 5 kg) weight change while the operating control is in the demand mode. The time used to make this adjustment shall be less than 60 seconds.

12.5.3 Test Run Completion. The test run is completed when the remaining weight of the test fuel charge is 0.0 lb (0.0 kg). End the test run when the scale has indicated a test fuel charge weight of 0.0 lb (0.0 kg) or less for 30 seconds.

12.5.3.1 At the end of the test run, stop the particulate sampling train and overall efficiency (SLM) measurements, and record the run time, and all final measurement values.

12.5.4 Heat Output Capacity Validation. The first test run must produce a heat output rate that is within 10 percent of the manufacturer's rated heat output capacity (Category IV) throughout the test run and an average heat output rate within 5 percent of the manufacturer's rated heat output capacity. If the appliance is not capable of producing a heat output within these limits, the manufacturer's rated heat output capacity is considered not validated and testing is to be terminated. In such cases, the tests may be restarted using a lower heat output capacity if requested by the manufacturer.

12.5.5 Additional Test Runs. Using the manufacturer's rated heat output capacity as a basis, conduct a test for additional heat output categories as specified in section 4.3. It is not required to run these tests in any particular order.

12.5.6 Alternative Heat Output Rate for Category I. If an appliance cannot be operated in the Category I heat output range due to stopped combustion, two test runs shall be conducted at heat output rates within Category II, provided that the completed test run burn rate is no greater than the burn rate expected in home use. If this rate cannot be achieved, the test is not valid.

When the alternative heat output rate is used, the weightings for the weighted averages indicated in Table 2 shall be the average of the Category I and II weightings and shall be applied to both Category II results. The two completed runs in Category II will be deemed to meet the requirement for runs completed in both Category I and Category II. Appliances that are not capable of operation within Category II (<25 percent of maximum) cannot be evaluated by this test method. The test report must include full documentation and discussion of the attempted runs, completed rums and calculations.

12.5.6.1 Stopped Fuel Combustion. Evidence that an appliance cannot be operated at a Category I heat output rate due to stopped fuel combustion shall include documentation of two or more attempts to operate the appliance in burn rate Category I and fuel combustion has stopped prior to complete consumption of the test fuel charge. Stopped fuel combustion is evidenced when an elapsed time of 60 minutes or more has occurred without a measurable (1 lb or 0.5 kg) weight change in the test fuel charge while the appliance operating control is in the demand mode. Report the evidence and the reasoning used to determine that a test in burn rate Category I cannot be achieved. For example, two unsuccessful attempts to operate at an output rate of 10 percent of the rated output capacity are not sufficient evidence that burn rate Category I cannot be achieved. Note that section 12.5.6 requires that the completed test run burn rate can be no greater than the burn rate expected in home use. If this rate cannot be achieved, the test is not valid.

12.5.7 Appliance Overheating. Appliances shall be capable of operating in all heat output categories without overheating to be rated by this test method. Appliance overheating occurs when the rate of heat withdrawal from the appliance is lower than the rate of heat production when the unit control is in the idle mode. This condition results in the water in the appliance continuing to increase in temperature well above the upper limit setting of the operating control. Evidence of overheating includes: 1 hour or more of appliance water temperature increase above the upper temperature set-point of the operating control, exceeding the temperature limit of a safety control device (independent from the operating control), boiling water in a non-pressurized system or activation of a pressure or temperature relief valve in a pressurized system.

12.6 Additional Test Runs. The testing laboratory may conduct more than one test run in each of the heat output categories specified in section 4.3.1. If more than one test run is conducted at a specified heat output rate, the results from at least two-thirds of the test runs in that heat output rate category shall be used in calculating the weighted average emission rate (See section 14.1.14). The measurement data and results of all test runs shall be reported regardless of which values are used in calculating the weighted average emission rate.

13.0 Calculation of Results

13.1 Nomenclature

E_T—Total particulate emissions for the full test run as determined per ASTM E2515–11 (IBR, see § 60.17) in grams

$E_{g/MJ}$—Emissions rate in grams per megajoule of heat output

$E_{lb/mmBtu}$ output—Emissions rate in pounds per million Btu of heat output

$E_{g/kg}$—Emissions factor in grams per kilogram of dry fuel burned

$E_{g/hr}$—Emissions factor in grams per hour

HHV—Higher heating value of fuel = 8600 Btu/lb (19.990 MJ/kg)

LHV—Lower heating value of fuel = 7988 Btu/lb (18.567 MJ/kg)

ΔT—Temperature difference between water entering and exiting the heat exchanger

Q_{out}—Total heat output in BTU's (megajoules)
Q_{in}—Total heat input available in test fuel charge in BTU (megajoules)
M—Mass flow rate of water in lb/min (kg/min)
V_i—Volume of water indicated by a totalizing flow meter at the ith reading in gallons (liters)
V_f—Volumetric flow rate of water in heat exchange system in gallons per minute (liters/min)
Θ—Total length of test run in hours
ti—Data sampling interval in minutes
η_{del}—Delivered heating efficiency in percent
Fi—Weighting factor for heat output category i (See Table 2)
T1—Temperature of water at the inlet on the supply side of the heat exchanger
T2—Temperature of the water at the outlet on the supply side of the heat exchanger
T3—Temperature of water at the inlet to the load side of the heat exchanger
TIavg—Average temperature of the appliance and water at start of the test

$$TI_{avg} - (T1 + T2)/2 \text{ at the start of the test, °F} \qquad \text{Eq.1}$$

TF_{avg}—Average temperature of the applicance and water at the end of the test

$$TF_{avg} - (T1 + T2)/2 \text{ at the end of the test, °F} \qquad \text{Eq.2}$$

MC—Fuel moisture content in percent dry basis
MC_i—Average moisture content of individual 4 x 4 fuel pieces in percent dry basis
MC_{sp}—Moisture content of spacers assumed to be 10 percent dry basis
σ—Density of water in pounds per gallon
C_p—Specific heat of water in Btu/lb, °F
C_{steel}—Specific heat of steel (0.1 Btu/lb, °F)
W_{fuel}—Fuel charge weight in pounds (kg)
W_i—Weight of individual fuel 4 x 4 pieces in pounds (kg)
W_{sp}—Weight of all spacers used in a fuel load in pounds (kg)
W_{app}—Weight of empty appliance in pounds
W_{wa}—Weight of water in supply side of the system in pounds

13.2 After the test is completed, determine the particulate emissions E_T in accordance with ASTM E2515–11 (IBR, see § 60.17).

13.3 Determine Average Fuel Load Moisture Content

$$MC_{Ave} = [[\ \Sigma\ W_i \text{ x } MC_i\ ] + [\ W_{sp} \text{ x } MC_{sp}\ ]] \div W_{fuel}, \% \qquad \text{Eq. 3}$$

13.4 Determine heat input

$$Q_{in} = (W_{fuel}/(1+(MC/100))) \text{ x HHV, BTU} \qquad \text{Eq. 4}$$

$$Q_{in\ LHV} = (W_{fuel}/(1+(MC/100))) \text{ x LHV, BTU} \qquad \text{Eq. 5}$$

13.5 Determine Heat Output and Efficiency

13.5.1 Determine heat output as:

Q_{out} = Σ [Heat output determined for each sampling time interval]+ Change in heat stored in the appliance.

$$Q_{out} = \left[\sum (C_{pi} \bullet \Delta T_i \bullet \dot{M}_i \bullet t_i)\right] + (W_{app} \bullet C_{Steel} + C_{pa} W_{water}) \bullet (TF_{avg} - TI_{avg}) \text{, BTU} \qquad \text{Eq. 6}$$

Note: The subscript (i) indicates the parameter value for sampling time interval t_i.

M_i = Mass flow rate = gal/min x density of water (lb/gal) = lb/min

$$M_i = V_{fi} \cdot \sigma_i \text{, lb/min} \qquad \text{Eq. 7}$$

$$\Sigma_i = (62.56 + (\ -.0003413 \text{ x } T3_i\ ) + (\ -.00006225 \text{ x } T3_i^2\ ))\ 0.1337 \text{, lbs/gal} \qquad \text{Eq. 8}$$

$$C_p = 1.0014 + (\ -.000003485 \text{ x } T3_i\ ) \text{ Btu/lb, °F} \qquad \text{Eq. 9}$$

C_{steel} = 0.1 Btu/lb, ° F

$$C_{pa} = 1.0014 + (-.000003485 \text{ X } (TI_{avg} + TF_{avg})/2) \text{, Btu/lb-°F} \qquad \text{Eq. 10}$$

$$V_{fi} = (V_i - V_{i-1})/(t_i - t_{i-1}) \text{, gal/min} \qquad \text{Eq. 11}$$

Note: Vi is the total water volume at the end of interval i and Vi-1 is the total water volume at the beginning of the time interval. This calculation is necessary when a totalizing type water meter is used.

13.5.2 Determine heat output rate as:

$$\text{Heat Output Rate} = Q_{out}/\Theta, \text{ BTU/hr} \quad \text{Eq. 12}$$

13.5.3 Determine emission rates and emission factors as:

$$E_{g/MJ} = E_T/(Q_{out} \times 0.001055), \text{ g/MJ} \quad \text{Eq. 13}$$

$$E_{lb/MM\ BTU\ output} = (E_T/453.59)/(Q_{output} \times 10^{-6}), \text{ lb/mmBtu Out} \quad \text{Eq. 14}$$

$$E_{g/kg} = E_T/(W_{fuel}/(1+MC/100)), \text{ g/dry kg} \quad \text{Eq, 15}$$

$$E_{g/hr} = E_T/\Theta, \text{ g/hr} \quad \text{Eq. 16}$$

13.5.4 Determine delivered efficiency as:

$$\eta_{del} = (Q_{out}/Q_{in}) \times 100, \% \quad \text{Eq. 17}$$

$$\eta_{del\ LHV} = (Q_{out}/Q_{in\ LHV}) \times 100, \% \quad \text{Eq. 18}$$

13.5.5 Determine η_{SLM}—Overall Efficiency (SLM) using Stack Loss

For determination of the average overall thermal efficiency (η_{SLM}) for the test run, use the data collected over the full test run and the calculations in accordance with CSA B415.1–10 (IBR, see § 60.17), clause 13.7 except for 13.7.2 (e), (f), (g), and (h), use the following average fuel properties for oak: percent C = 50.0, percent H = 6.6, percent O = 43.2, percent ash = 0.2 percent. The averaging period for determination of efficiency by the stack loss method allows averaging over 10 minute time periods for flue gas temperature, flue gas CO_2, and flue gas CO for the determination of the efficiency. However, under some cycling conditions the ''on'' period may be short relative to this 10 minute period. For this reason, during cycling operation the averaging period for these parameters may not be longer than the burner on period divided by 10. The averaging period need not be shorter than one minute. During the off period, under cycling operation, the averaging periods specified may be used. Where short averaging times are used, however, the averaging period for fuel consumption may still be at 10 minutes. This average wood consumption rate shall be applied to all of the smaller time intervals included.

13.5.5.1 Whenever the CSA B415.1–10 (IBR, see § 60.17) overall efficiency is found to be lower than the overall efficiency based on load side measurements, as determined by Eq. 16 of this method, section 14.1.7 of the test report must include a discussion of the reasons for this result.

13.6 Weighted Average Emissions and Efficiency

13.6.1 Determine the weighted average emission rate and delivered efficiency from the individual tests in the specified heat output categories. The weighting factors (Fi) are derived from an analysis of ASHRAE bin data which provides details of normal building heating requirements in terms of percent of design capacity and time in a particular capacity range—or ''bin''—over the course of a heating season. The values used in this method represent an average of data from several cities located in the northern United States.

$$\text{Weighted average delivered efficiency: } \eta_{avg} = \Sigma\, \eta_i \times F_i, \% \quad \text{Eq. 19}$$

$$\text{Weighted average emissions: } E_{avg} = \Sigma E_i \times F_i, \% \quad \text{Eq. 20}$$

13.7 Average Heat Output ($Q_{out\text{-}8hr}$) and Efficiency (($\eta_{avg\text{-}8hr}$) for 8 hour burn time.

13.7.1 Units tested under this standard typically require infrequent fuelling, 8 to 12 hours intervals being typical. Rating unit's based on an average output sustainable over an 8 hour duration will assist consumers in appropriately sizing units to match the theoretical heat demand of their application.

13.7.2 Calculations:

$$Q_{out\text{-}8hr} = X1 + \{ (8 - Y1) \times [(X2 - X1) / (Y2 - Y1)] \}, \% \quad \text{Eq. 21}$$

$$\eta_{avg\text{-}8hr} = \eta_{del1} + \{ (8 - Y1) \times [(\eta_{del2} - \eta_{del1}) / (Y2 - Y1)] \}, \% \quad \text{Eq. 22}$$

Where:

Y1 = Test duration just above 8 hrs
Y2 = Test duration just below 8 hrs
X1 = Actual load for duration Y1
X2 = Actual load for duration Y2
η_{del1} = Average delivered efficiency for duration Y1
η_{del2} = Average delivered efficiency for duration Y2

13.7.2.1 Determine the test durations and actual load for each category as recorded in Table 1A.

13.7.2.2 Determine the data point that has the nearest duration greater than 8 hrs.

X1 = Actual load,
Y1 = Test duration, and
η_{del1} = Average delivered efficiency for this data point

13.7.2.3 Determine the data point that has the nearest duration less than 8 hours.

X2 = Actual load,
Y2 = Test duration, and
η_{del2} = Average delivered efficiency for this data point

13.7.2.4 Example:

CATEGORY ACTUAL LOAD DURATION

[Category Actual Load Duration ηdel]

	(Btu/Hr)	(Hr)	(%)
1	15,000	10.2	70.0
2	26,000	8.4	75.5
3	50,000	6.4	80.1
4	100,000	4.7	80.9

Category 2 duration is just above 8 hours, therefore: X1 = 26,000 Btu/hr, η_{del1} = 75.5% and Y1 = 8.4 hrs

Category 3 duration is just below 8 hours, therefore: X2 = 50,000 Btu/hr, η_{del2} = 80.1% and Y2 = 6.4 hrs

$Q_{out\text{-}8hr}$ = 26,000 + {(8—8.4) × [(50,000—26,000)/(6.4—8.4)]} = 30,800 BTU/hr

$\eta_{avg\text{-}8hr}$ = 75.5 + {(8—8.4) × [(80.1—75.5)/(6.4—8.4)]} = 76.4%

13.8 Carbon Monoxide Emissions

For each minute of the test period, the carbon monoxide emission rate shall be calculated as:

$$CO_{g/min} = Q_{std} \cdot CO_s \cdot 3.30\text{x}10^{-5} \qquad \text{Eq. 23}$$

Total CO emissions for each of the three test periods (CO_{1}, CO_{2}, CO_{3}) shall be calculated as the sum of the emission rates for each of the 1 minute intervals.

Total CO emission for the test run, CO_T, shall be calculated as the sum of CO_{1}, CO_{2}, and CO_{3}.

14.0 Report

14.1.1 The report shall include the following.

14.1.2 Name and location of the laboratory conducting the test.

14.1.3 A description of the appliance tested and its condition, date of receipt and dates of tests.

14.1.4 A statement that the test results apply only to the specific appliance tested.

14.1.5 A statement that the test report shall not be reproduced except in full, without the written approval of the laboratory.

14.1.6 A description of the test procedures and test equipment including a schematic or other drawing showing the location of all required test equipment. Also, a description of test fuel sourcing, handling and storage practices shall be included.

14.1.7 Details of deviations from, additions to or exclusions from the test method, and their data quality implications on the test results (if any), as well as information on specific test conditions, such as environmental conditions.

14.1.8 A list of participants and observers present for the tests.

14.1.9 Data and drawings indicating the fire box size and location of the fuel charge.

14.1.10 Drawings and calculations used to determine firebox volume.

14.1.11 Information for each test run fuel charge including piece size, moisture content, and weight.

14.1.12 All required data for each test run shall be provided in spreadsheet format. Formulae used for all calculations shall be accessible for review.

14.1.13 Test run duration for each test.

14.1.14 Calculated results for delivered efficiency at each burn rate and the weighted average emissions reported as total emissions in grams, pounds per mm Btu of delivered heat, grams per MJ of delivered heat, grams per kilogram of dry fuel and grams per hour. Results shall be reported for each heat output category and the weighted average.

14.1.15 Tables 1A, 1B, 1C and Table 2 must be used for presentation of results in test reports.

14.1.16 A statement of the estimated uncertainty of measurement of the emissions and efficiency test results.

14.1.17 Raw data, calibration records, and other relevant documentation shall be retained by the laboratory for a minimum of 7 years.

15.0 Precision and Bias

15.1 Precision—It is not possible to specify the precision of the procedure in Method 28WHH because the appliance operation and fueling protocols and the appliances themselves produce variable amounts of emissions and cannot be used to determine reproducibility or repeatability of this measurement method.

15.2 Bias—No definitive information can be presented on the bias of the procedure in Method 28WHH for measuring solid fuel burning hydronic heater emissions because no material having an accepted reference value is available.

16.0 Keywords

16.1 Solid fuel, hydronic heating appliances, wood-burning hydronic heaters.

Table 1A. Data Summary Part A

						Θ	W_{fuel}	MC_{ave}	Q_{in}	Q_{out}
Category	Run No	Load % Capacity	Target Load	Actual Load	Act Load	Test Duration	Wood Wt	Wood Moisture	Heat Input	Heat Output
			BTU/hr	BTU/hr	% of max	hrs	lb	% DB	BTU	BTU
I		< 15% of max								
II		16-24% of max								
III		25-50% of max								
IV		Max capacity								

Table 1B. Data Summary Part B

			T2 Min	E_T	E	E	$E_{g/hr}$	$E_{g/kg}$	η_{del}	η_{SLM}
Category	Run No	Load % Capacity	Min Return Water Temp.	Total PM Emissions	PM Output Based	PM Output Based	PM Rate	PM Factor	Delivered Efficiency	Stack Loss Efficiency
			°F	g	$lb_{MMBTU\ Out}$	g/MJ	g/hr	g/kg	%	%
I		< 15% of max								
II		16-24% of max								
III		25-50% of max								
IV		Max capacity								

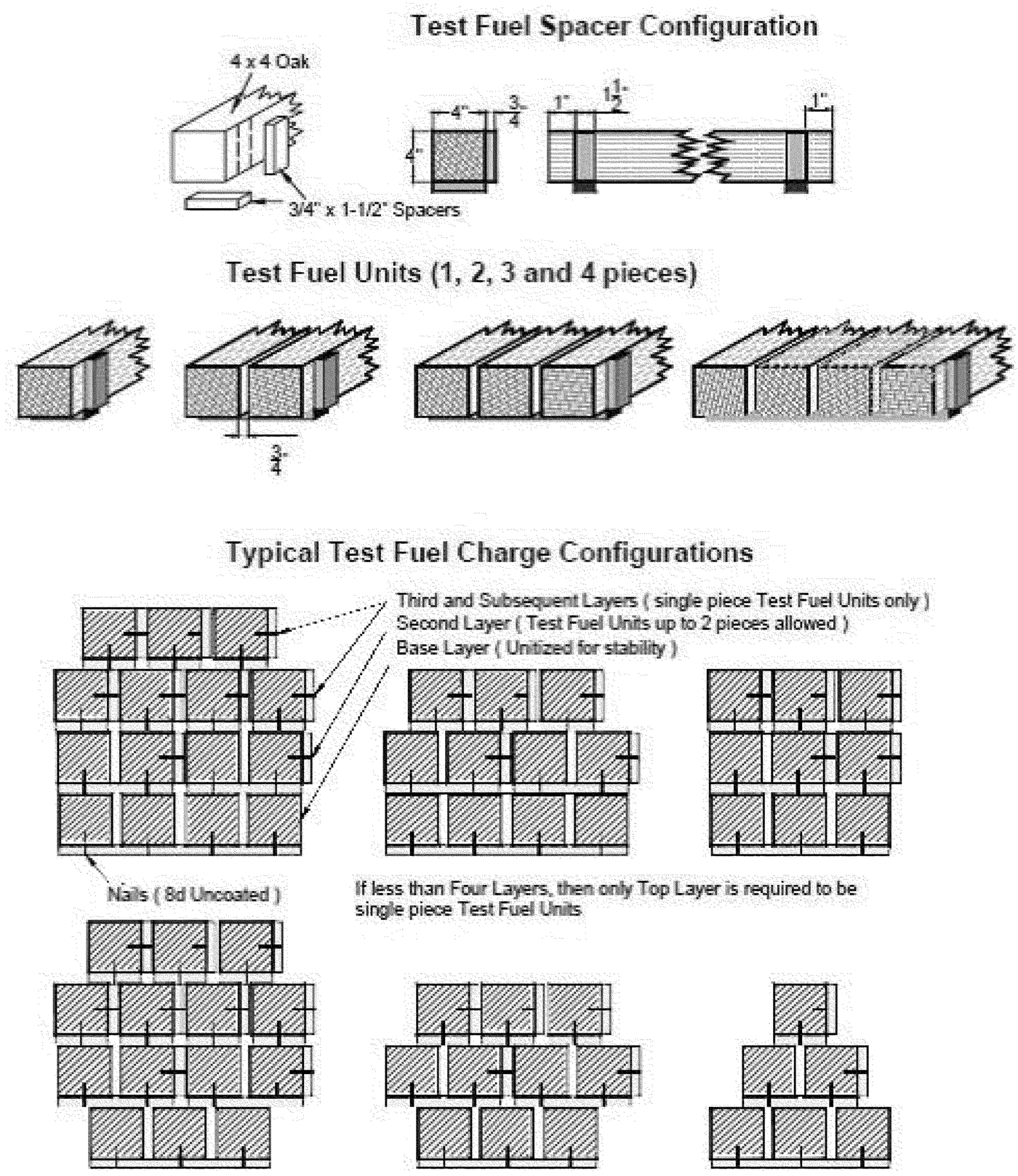
Table 1C: Hangtag Information (optional)

MANUFACTURER:			
MODEL NUMBER:			
MAXIMUM OUTPUT RATING:	Qmax		BTU/HR
ANNUAL EFFICIENCY RATING:	N_{avg}		(Using higher heating value)
PARTICLE EMISSIONS:	E_{avg}		GRAMS/HR (average)
			LBS/MILLION BTU OUTPUT
CARBON MONOXIDE:	COg/MIN		GRAMS/MINUTE

Table 2. Annual Weighting

Category	Weighting Factor (F_i)	$\eta_{del,i}$ x F_i	$E_{g/MJ,i}$ x F_i	$E_{g/kg,i}$ x F_i	$E_{lb/mmBtu\ Out,i}$ x F_i	$E_{g/hr,i}$ x F_i
I	0.437					
II	0.238					
III	0.275					
IV	0.050					
Totals	1.000					

Figure 1. Typical Test Fuel Piece



Test Method 28WHH for Certification of Cord Wood-Fired Hydronic Heating Appliances With Partial Thermal Storage: Measurement of Particulate Matter (PM) and Carbon Monoxide (CO) Emissions and Heating Efficiency of Wood-Fired Hydronic Heating Appliances With Partial Thermal Storage

1.0 Scope and Application

1.1 This test method applies to wood-fired hydronic heating appliances with heat storage external to the appliance. The units typically transfer heat through circulation of a liquid heat exchange media such as water or a water-antifreeze mixture. Throughout this document, the term ''water'' will be used to denote any of the heat transfer liquids approved for use by the manufacturer.

1.2 The test method measures PM and CO emissions and delivered heating efficiency at specified heat output rates referenced against the appliance's rated heating capacity as specified by the manufacturer and verified under this test method.

1.3 PM emissions are measured by the dilution tunnel method as specified in the EPA Method 28WHH and the standards referenced therein with the exceptions noted in section 12.5.9. Delivered efficiency is measured by determining the fuel energy input and appliance output. Heat output is determined through measurement of the flow rate and temperature change of water circulated through a heat exchanger external to the appliance and the increase in energy of the external storage. Heat input is determined from the mass of dry wood fuel and its higher heating value (HHV). Delivered efficiency does not attempt to account for pipeline loss.

1.4 Products covered by this test method include both pressurized and non-pressurized hydronic heating appliances intended to be fired with wood and for which the manufacturer specifies for indoor or outdoor installation. The system, which includes the heating appliance and external storage, is commonly connected to a heat exchanger by insulated pipes and normally includes a pump to circulate heated liquid. These systems are used to heat structures such as homes, barns and greenhouses. They also provide heat for domestic hot water, spas and swimming pools.

1.5 Distinguishing features of products covered by this standard include:

1.5.1 The manufacturer specifies the application for either indoor or outdoor installation.

1.5.2 A firebox with an access door for hand loading of fuel.

1.5.3 Typically an aquastat mounted as part of the appliance that controls combustion air supply to maintain the liquid in the appliance within a predetermined temperature range provided sufficient fuel is available in the firebox. The appliance may be equipped with other devices to control combustion.

1.5.4 A chimney or vent that exhausts combustion products from the appliance.

1.5.5 A liquid storage system, typically water, which is not large enough to accept all of the heat produced when a full load of wood is burned and the storage system starts a burn cycle at 125 °F.

1.5.6 The heating appliances require external thermal storage and these units will only be installed as part of a system which includes thermal storage. The manufacturer specifies the minimum amount of thermal storage required. However, the storage system

shall be large enough to ensure that the boiler (heater) does not cycle, slumber, or go into an off-mode when operated in a Category III load condition (See section 4.3).

1.6 The values stated are to be regarded as the standard whether in I–P or SI units. The values given in parentheses are for information only.

2.0 Summary of Method and References

2.1 PM and CO emissions are measured from a wood–fired hydronic heating appliance burning a prepared test fuel charge in a test facility maintained at a set of prescribed conditions. Procedures for determining heat output rates, PM and CO emissions, and efficiency and for reducing data are provided.

2.2 Referenced Documents

2.2.1 EPA Standards

2.2.1.1 Method 28 Certification and Auditing of Wood Heaters

2.2.1.2 Method 28WHH Measurement of Particulate Emissions and Heating Efficiency of Wood-Fired Hydronic Heating Appliances and the Standards Referenced therein.

2.2.2 Other Standards

2.2.2.1 CSA–B415.1–10 *Performance Testing of Solid-Fuel-Burning Heating Appliances*

3.0 Terminology

3.1 Definitions

3.1.1 Hydronic Heating—A heating system in which a heat source supplies energy to a liquid heat exchange media such as water that is circulated to a heating load and returned to the heat source through pipes.

3.1.2 Aquastat—A control device that opens or closes a circuit to control the rate of fuel consumption in response to the temperature of the heating media in the heating appliance.

3.1.3 Delivered Efficiency—The percentage of heat available in a test fuel charge that is delivered to a simulated heating load or the storage system as specified in this test method.

3.1.4 Emission Factor—The emission of a pollutant expressed in mass per unit of energy (typically) output from the boiler/heater.

3.1.5 Emission Index—The emission of a pollutant expressed in mass per unit mass of fuel used.

3.1.6 Emission Rate—The emission of a pollutant expressed in mass per unit time

3.1.7 Manufacturer's Rated Heat Output Capacity—The value in Btu/hr (MJ/hr) that the manufacturer specifies that a particular model of hydronic heating appliance is capable of supplying at its design capacity as verified by testing, in accordance with section 12.5.4.

3.1.8 Heat Output Rate—The average rate of energy output from the appliance during a specific test period in Btu/hr (MJ/hr).

3.1.9 Firebox—The chamber in the appliance in which the test fuel charge is placed and combusted.

3.1.10 NIST—National Institute of Standards and Technology.

3.1.11 Test Fuel Charge—The collection of test fuel placed in the appliance at the start of the emission test run.

3.1.12 Test Run—An individual emission test which encompasses the time required to consume the mass of the test fuel charge. The time of the test run also considers the time for the energy to be drawn from the thermal storage.

3.1.13 Test Run Under "Cold-to-Cold" Condition—Under this test condition the test fuel is added into an empty chamber along with kindling and ignition materials (paper). The boiler/heater at the start of this test is typically 125° to 130 °F.

3.1.14 Test Run Under "Hot-to-Hot" Condition—Under this test condition the test fuel is added onto a still-burning bed of charcoals produced in a pre-burn period. The boiler/heater water is near its operating control limit at the start of the test.

3.1.15 Overall Efficiency, also known as Stack Loss Efficiency—The efficiency for each test run as determined using the CSA B415.1–10 (IBR, see § 60.17) stack loss method (SLM).

3.1.16 Phases of a Burn Cycle—The "startup phase" is defined as the period from the start of the test until 15 percent of the test fuel charge is consumed. The "steady-state phase" is defined as the period from the end of the startup phase to a point at which 80 percent of the test fuel charge is consumed. The "end phase" is defined as the time from the end of the steady-state period to the end of the test.

3.1.17 Thermopile—A device consisting of a number of thermocouples connected in series, used for measuring differential temperature.

3.1.18 Slumber Mode—This is a mode in which the temperature of the water in the boiler/heater has exceeded the operating control limit and the control has changed the boiler/heater fan speed, dampers, and/or other operating parameters to minimize the heat output of the boiler/heater.

4.0 Summary of Test Method

4.1 Dilution Tunnel. Emissions are determined using the "dilution tunnel" method specified in EPA Method 28WHH and the standards referenced therein. The flow rate in the dilution tunnel is maintained at a constant level throughout the test cycle and accurately measured. Samples of the dilution tunnel flow stream are extracted at a constant flow rate and drawn through high efficiency filters. The filters are dried and weighed before and after the test to determine the emissions collected and this value is multiplied by the ratio of tunnel flow to filter flow to determine the total particulate emissions produced in the test cycle.

4.2 Efficiency. The efficiency test procedure takes advantage of the fact that this type of system delivers heat through circulation of the heated liquid (water) from the system to a remote heat exchanger (*e.g.* baseboard radiators in a room) and back to the system. Measurements of the cooling water temperature difference as it enters and exits the test system heat exchanger along with the measured flow rate allow for an accurate determination of the useful heat output of the appliance. Also included in the heat output is the change in the energy content in the storage system during a test run. Energy input to the appliance during the test run is determined by weight of the test fuel charge, adjusted for moisture content, multiplied by the higher heating value. Additional measurements of the appliance weight and temperature at the beginning and end of a test cycle are used to correct for heat stored in the appliance. Overall efficiency (SLM) is determined using the CSA B415.1–10 (IBR, see § 60.17) stack loss method for data quality assurance purposes.

4.3 Operation. Four test categories are defined for use in this method. These are:

4.3.1 Category I: A heat output of 15 percent or less of manufacturer's rated heat output capacity.

4.3.2 Category II: A heat output of 16 percent to 24 percent of manufacturer's rated heat output capacity.

4.3.3 Category III: A heat output of 25 percent to 50 percent of manufacturer's rated heat output capacity.

4.3.4 Category IV: Manufacturer's Rated Heat Output Capacity. These heat output categories refer to the output from the system by way of the load heat exchanger installed for the test. The output from just the boiler/heater part of the system may be higher for all or part of a test, as part of this boiler/heater output goes to storage.

For the Category III and IV runs, appliance operation is conducted on a hot-to-hot test cycle meaning that the appliance is brought to operating temperature and a coal bed is established prior to the addition of the test fuel charge and measurements are made for each test fuel charge cycle. The measurements are made under constant heat draw conditions within pre-determined ranges. No attempt is made to modulate the heat demand to simulate an indoor thermostat cycling on and off in response to changes in the indoor environment.

For the Category I and II runs, the unit is tested with a "cold start." At the manufacturer's option, the Category II and III runs may be waived and it may be assumed that the particulate emission values and efficiency values determined in the startup, steady-state, and end phases of Category I are applicable in Categories II and III for the purpose of determining the annual averages in lb/mmBtu and g/MJ (See section 13). For the annual average in g/hr, the length of time for stored heat to be drawn from thermal storage shall be determined for the test load requirements of the respective category.

All test operations and measurements shall be conducted by personnel of the laboratory responsible for the submission of the test report.

5.0 Significance and Use

5.1 The measurement of particulate matter emission and CO rates is an important test method widely used in the practice of air pollution control.

5.1.1 These measurements, when approved by state or federal agencies, are often required for the purpose of determining compliance with regulations and statutes.

5.1.2 The measurements made before and after design modifications are necessary to demonstrate the effectiveness of design changes in reducing emissions and make this standard an important tool in manufacturers' research and development programs.

5.2 Measurement of heating efficiency provides a uniform basis for comparison of product performance that is useful to the consumer. It is also required to relate emissions produced to the useful heat production.

5.3 This is a laboratory method and is not intended to be fully representative of all actual field use. It is recognized that users of hand-fired, wood-burning equipment have a great deal of influence over the performance of any wood-burning appliance. Some compromises in realism have been made in the interest of providing a reliable and repeatable test method.

6.0 Test Equipment

6.1 Scale. A platform scale capable of weighing the boiler/heater under test and associated parts and accessories when completely filled with water to an accuracy of ±1.0 pound (±0.5 kg) and a readout resolution of ±0.2 pound (±0.1 kg).

6.2 Heat Exchanger. A water-to-water heat exchanger capable of dissipating the expected heat output from the system under test.

6.3 Water Temperature Difference Measurement. A Type—T 'special limits' thermopile with a minimum of 5 pairs of junctions shall be used to measure the temperature difference in water entering and leaving the heat exchanger. The temperature difference measurement uncertainty of this type of thermopile is equal to or less than ±0.50 °F (±0.25 °C). Other temperature measurement methods may be used if the temperature difference measurement uncertainty is equal to or less than ±0.50 °F (±0.25 °C). This measurement uncertainty shall include the temperature sensor, sensor well arrangement, piping arrangements, lead wire, and measurement/recording system. The response time of the temperature measurement system shall be less than half of the time interval at which temperature measurements are recorded.

6.4 Water Flow Meter. A water flow meter shall be installed in the inlet to the load side of the heat exchanger. The flow meter shall have an accuracy of ±1 percent of measured flow.

6.4.1 Optional—Appliance Side Water Flow Meter. A water flow meter with an accuracy of ±1 percent of the flow rate is recommended to monitor supply side water flow rate.

6.5 Optional Recirculation Pump. Circulating pump used during test to prevent stratification, in the boiler/heater, of liquid being heated.

6.6 Water Temperature Measurement. Thermocouples or other temperature sensors to measure the water temperature at the inlet and outlet of the load side of the heat exchanger must meet the calibration requirements specified in 10.1 of this method.

6.7 Lab Scale. For measuring the moisture content of wood slices as part of the overall wood moisture determination. Accuracy of ±0.01 pounds.

6.8 Flue Gas Temperature Measurement. Must meet the requirements of CSA B415.1–10 (IBR, see § 60.17), clause 6.2.2.

6.9 Test Room Temperature Measurement. Must meet the requirements of CSA B415.1–10 (IBR, see § 60.17), clause 6.2.1.

6.10 Flue Gas Composition Measurement. Must meet the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 6.3.1 through 6.3.3.

6.11 Dilution Tunnel CO Measurement. In parallel with the flue gas composition measurements, the CO concentration in the dilution tunnel shall also be measured and reported at time intervals not to exceed one minute. This analyzer shall meet the zero and span drift requirements of CSA B415.1–10 (IBR, see § 60.17). In addition the measurement repeatability shall be better than ±15 ppm over the range of CO levels observed in the dilution tunnel.

7.0 Safety

7.1 These tests involve combustion of wood fuel and substantial release of heat and products of combustion. The heating system also produces large quantities of very hot water and the potential for steam production and system pressurization. Appropriate precautions must be taken to protect personnel from burn hazards and respiration of products of combustion.

8.0 Sampling, Test Specimens and Test Appliances

8.1 Test specimens shall be supplied as complete appliances, as described in marketing materials, including all controls and accessories necessary for installation in the test facility. A full set of specifications, installation and operating instructions, and design and assembly drawings shall be provided when the product is to be placed under certification of a third-party agency. The manufacturer's written installation and operating instructions are to be used as a guide in the set-up and testing of the appliance and shall be part of the test record.

8.2 The size, connection arrangement, and control arrangement for the thermal storage shall be as specified in the manufacturer's documentation. It is not necessary to use the specific storage system that the boiler/heater will be marketed with. However, the capacity of the system used in the test cannot be greater than that specified as the minimum allowable for the boiler/heater.

8.3 All system control settings shall be the as-shipped, default settings. These default settings shall be the same as those communicated in a document to the installer or end user. These control settings and the documentation of the control settings as to be provided to the installer or end user shall be part of the test record.

8.4 Where the manufacturer defines several alternatives for the connection and loading arrangement, one shall be defined in the appliance documentation as the default or standard installation. It is expected that this will be the configuration for use with a simple baseboard heating system. This is the configuration to be followed for these tests. The manufacturer's documentation shall define the other arrangements as optional or alternative arrangements.

9.0 Preparation of Test Equipment

9.1 The appliance is to be placed on a scale capable of weighing the appliance fully loaded with a resolution of ±0.2 lb (0.1 kg).

9.2 The appliance shall be fitted with the type of chimney recommended or provided by the manufacturer and extending to 15 ±0.5 feet (4.6 ±0.15 m) from the upper surface of the scale. If no flue or chimney system is recommended or provided by the manufacturer, connect the appliance to a flue of a diameter equal to the flue outlet of the appliance. The flue section from the appliance flue collar to 8 ±0.5 feet above the scale shall be single wall stove pipe and the remainder of the flue shall be double wall insulated class A chimney.

9.3 Optional Equipment Use

9.3.1 A recirculation pump may be installed between connections at the top and bottom of the appliance to minimize thermal stratification if specified by the manufacturer. The pump shall not be installed in such a way as to change or affect the flow rate between the appliance and the heat exchanger.

9.3.2 If the manufacturer specifies that a thermal control valve or other device be installed and set to control the return water temperature to a specific set point, the valve or other device shall be installed and set per the manufacturer's written instructions.

9.4 Prior to filling the boiler/heater with water, weigh and record the appliance mass.

9.5 Heat Exchanger

9.5.1 Plumb the unit to a water-to-water heat exchanger with sufficient capacity to draw off heat at the maximum rate anticipated. Route hoses and electrical cables and instrument wires in a manner that does not influence the weighing accuracy of the scale as indicated by placing dead weights on the platform and verifying the scale's accuracy.

9.5.2 Locate thermocouples to measure the water temperature at the inlet and outlet of the load side of the heat exchanger.

9.5.3 Install a thermopile (or equivalent instrumentation) meeting the requirements of section 6.3 to measure the water temperature difference between the inlet and outlet of the load side of the heat exchanger

9.5.4 Install a calibrated water flow meter in the heat exchanger load side supply line. The water flow meter is to be installed on the cooling water inlet side of the heat exchanger so that it will operate at the temperature at which it is calibrated.

9.5.5 Place the heat exchanger in a box with 2 in. (50 mm) of expanded polystyrene (EPS) foam insulation surrounding it to minimize heat losses from the heat exchanger.

9.5.6 The reported efficiency and heat output rate shall be based on measurements made on the load side of the heat exchanger.

9.5.7 Temperature instrumentation per section 6.6 shall be installed in the appliance outlet and return lines. The average of the outlet and return water temperature on the supply side of the system shall be considered the average appliance temperature for calculation of heat storage in the appliance (TF_{avg} and TI_{avg}). Installation of a water flow meter in the supply side of the system is optional.

9.6 Storage Tank. The storage tank shall include a destratification pump as illustrated in Figure 1. The pump will draw from the bottom of the tank and return to the top as illustrated. Temperature sensors (TS1 and TS2 in Figure 1) shall be included to measure the temperature in the recirculation loop. The valve plan in Figure 1 allows the tank recirculation loop to operate and the boiler/heater-to-heat exchanger loop to operate at the same time but in isolation. This would typically be done before the start of a test or following completion of a test to determine the end of test average tank temperature. The nominal flow rate in the storage tank recirculation loop can be estimated based on pump manufacturers' performance curves and any significant restriction in the recirculation loop.

9.7 Fill the system with water. Determine the total weight of the water in the appliance when the water is circulating. Verify that the scale indicates a stable weight under operating conditions. Make sure air is purged properly.

10.0 Calibration and Standardization

10.1 Water Temperature Sensors. Temperature measuring equipment shall be calibrated before initial use and at least semi-annually thereafter. Calibrations shall be in compliance with National Institute of Standards and Technology (NIST) Monograph 175, Standard Limits of Error.

10.2 Heat Exchanger Load Side Water Flow Meter.

10.2.1 The heat exchanger load side water flow meter shall be calibrated within the flow range used for the test run using NIST-traceable methods. Verify the calibration of the water flow meter before and after each test run and at least once during each test run by comparing the water flow rate indicated by the flow meter to the mass of water collected from the outlet of the heat exchanger over a timed interval. Volume of the collected water shall be determined based on the water density calculated from section 13, Eq. 12, using the water temperature measured at the flow meter. The uncertainty in the verification procedure used shall be 1 percent or less. The water flow rate determined by the collection and weighing method shall be within 1 percent of the flow rate indicated by the water flow meter.

10.3 Scales. The scales used to weigh the appliance and test fuel charge shall be calibrated using NIST-traceable methods at least once every 6 months.

10.4 Flue Gas Analyzers—In accordance with CSA B415.1–10 (IBR, see § 60.17), clause 6.8.

11.0 Conditioning

11.1 Prior to testing, an appliance is to be operated for a minimum of 50 hours using a medium heat draw rate. The conditioning may be at the manufacturer's facility prior to the certification test. If the conditioning is at the certification test laboratory, the pre-burn for the first test can be included as part of the conditioning requirement. If conditioning is included in pre-burn, then the appliance shall be aged with fuel meeting the specifications outlined in section 12.2 with a moisture content between 19 and 25 percent on a dry basis. Operate the appliance at a medium heat output rate (Category II or III) for at least 10 hours for non-catalytic appliances and 50 hours for catalytic appliances. Record and report hourly flue gas exit temperature data and the hours of operation. The aging procedure shall be conducted and documented by a testing laboratory.

12.0 Procedure

12.1 Appliance Installation. Assemble the appliance and parts in conformance with the manufacturer's written installation instructions. Clean the flue with an appropriately sized, wire chimney brush before each certification test series.

12.2 Fuel. Test fuel charge fuel shall be red (*Quercus ruba L.*) or white (*Quercus Alba*) oak 19 to 25 percent moisture content on a dry basis. Piece length shall be 80 percent of the firebox depth rounded down to the nearest 1 inch (25mm) increment. For example, if the firebox depth is 46 inches (1168mm) the piece length would be 36 inches (46 inches x 0.8 = 36.8 inches, rounded down to 36 inches). Pieces are to be placed in the firebox parallel to the longest firebox dimension. For fireboxes with sloped surfaces that create a non-uniform firebox length, the piece length shall be adjusted for each layer based on 80 percent of the length at the level where the layer is placed. The test fuel shall be cord wood with cross section dimensions and weight limits as defined in CSA B415.1–10 (IBR, see § 60.17), section 8.3, Table 4. The use of dimensional lumber is not allowed.

12.2.1 Select three pieces of cord wood from the same batch of wood as the test fuel and the same weight as the average weight of the pieces in the test load ± 1.0 lb. From each of these three pieces, cut three slices. Each slice shall be ½ inch to ¾ inch thick. One slice shall be cut across the center of the length of the piece. The other two slices shall be cut half way between the center and the end. Immediately measure the mass of each piece in pounds. Dry each slice in an oven at 220 °F for 24 hours or until no further weight change occurs. The slices shall be arranged in the oven so as to provide separation between faces. Remove from the oven and measure the mass of each piece again as soon as practical, in pounds.

The moisture content of each slice, on a dry basis, shall be calculated as:

$$MC_{slice} = \frac{100 \cdot (W_{SliceWet} - W_{SliceDry})}{W_{SliceDry}}$$

Where:

$W_{SliceWet}$ = weight of the slice before drying in pounds

$W_{SliceDry}$ = weight of the slice after drying in pounds

MC_{Slice} = moisture content of the slice in % dry basis

The average moisture content of the entire test load (MC) shall be determined using Eq. 6. Each individual slice shall have a moisture content in the range of 18 percent to 28 percent on a dry basis. The average moisture content for the test fuel load shall be in the range of 19 percent to 25 percent. Moisture shall not be added to previously dried fuel pieces except by storage under high humidity conditions and temperature up to 100 °F. Fuel moisture measurement shall begin within 4 hours of using the fuel batch for a test. Use of a pin-type meter to estimate the moisture content prior to a test is recommended.

12.2.2 Firebox Volume. Determine the firebox volume in cubic feet. Firebox volume shall include all areas accessible through the fuel loading door where firewood could reasonably be placed up to the horizontal plane defined by the top of the loading door. A drawing of the firebox showing front, side and plan views or an isometric view with interior dimensions shall be provided by the manufacturer and verified by the laboratory. Calculations for firebox volume from computer aided design (CAD) software programs are acceptable and shall be included in the test report if used. If the firebox volume is calculated by the laboratory the firebox drawings and calculations shall be included in the test report.

12.2.3 Test Fuel charge. Test fuel charges shall be determined by multiplying the firebox volume by 10 pounds (4.54 kg) per ft^3 (28L), or a higher load density as recommended by the manufacturer's printed operating instructions, of wood (as used wet weight). Select the number of pieces of cord wood that most nearly match this target weight. However, the test fuel charge cannot be less than the target of 10 pounds (4.54 kg) per ft^3 (28L).

12.3 Sampling Equipment. Prepare the particulate emission sampling equipment as defined by EPA Method 28WHH and the standards referenced therein.

12.4 Appliance Startup. The appliance shall be fired with wood fuel of any species, size and moisture content, at the laboratory's discretion, to bring it up to operating temperature. Operate the appliance until the water is heated to the upper operating control limit and has cycled at least two times. Then remove all unburned fuel, zero the scale and verify the scales accuracy using dead weights.

12.4.1 Startup Procedure for Category III and IV Test Runs, ''Hot-to-Hot.''

12.4.1.1 Pretest t Burn Cycle. Following appliance startup (section 12.4), reload appliance with oak cord wood and allow it to burn down to the specified coal bed weight. The pre-test burn cycle fuel charge

weight shall be within ±10 percent of the test fuel charge weight. Piece size and length shall be selected such that charcoalization is achieved by the time the fuel charge has burned down to the required coal bed weight. Pieces with a maximum thickness of approximately 2 inches have been found to be suitable. Charcoalization is a general condition of the test fuel bed evidenced by an absence of large pieces of burning wood in the coal bed and the remaining fuel pieces being brittle enough to be broken into smaller charcoal pieces with a metal poker. Manipulations to the fuel bed prior to the start of the test run are to be done to achieve charcoalization while maintaining the desired heat output rate. During the pre-test burn cycle and at least one hour prior to starting the test run, adjust water flow to the heat exchanger to establish the target heat draw for the test. For the first test run the heat draw rate shall be equal to the manufacturer's rated heat output capacity.

12.4.1.2 Allowable Adjustments. Fuel addition or subtractions, and coal bed raking shall be kept to a minimum but are allowed up to 15 minutes prior to the start of the test run. For the purposes of this method, coal bed raking is the use of a metal tool (poker) to stir coals, break burning fuel into smaller pieces, dislodge fuel pieces from positions of poor combustion, and check for the condition of charcoalization. Record all adjustments to and additions or subtractions of fuel, and any other changes to the appliance operations that occur during pretest ignition period. During the 15-minute period prior to the start of the test run, the wood heater loading door shall not be open more than a total of 1 minute. Coal bed raking is the only adjustment allowed during this period.

12.4.1.3 Coal Bed Weight. The appliance is to be loaded with the test fuel charge when the coal bed weight is between 10 percent and 20 percent of the test fuel charge weight. Coals may be raked as necessary to level the coal bed but may only be raked and stirred once between 15 to 20 minutes prior to the addition of the test fuel charge.

12.4.1.4 Storage. The Category III and IV test runs may be done either with or without the thermal storage. If thermal storage is used, the initial temperature of the storage must be 125 °F or greater at the start of the test. The storage may be heated during the pre-test burn cycle or it may be heated by external means. If thermal storage is used, prior to the start of the test run, the storage tank destratification pump, shown in Figure 1, shall be operated until the total volume pumped exceeds 1.5 times the tank volume and the difference between the temperature at the top and bottom of the storage tank (TS_1 and TS_2) is less than 1 °F. These two temperatures shall then be recorded to determine the starting average tank temperature. The total volume pumped may be based on the nominal flow rate of the destratification pump (See section 9.6). If the Category III and IV runs are done with storage, it is recognized that during the last hour of the pre-burn cycle the storage tank must be mixed to achieve a uniform starting temperature and cannot receive heat from the boiler/heater during this time. During this time period, the boiler/heater might cycle or go into a steady reduced output mode. (Note—this would happen, for example, in a Category IV run if the actual maximum output of the boiler/heater exceed the manufacturer's rated output.) A second storage tank may be used temporarily to enable the boiler/heater to operate during this last hour of the pre-burn period as it will during the test period. The temperature of this second storage tank is not used in the calculations but the return water to the boiler/heater (after mixing device if used) must be 125 °F or greater.

12.4.2 Startup Procedure for Category I and II Test Runs, ''Cold-to-Cold.''

12.4.2.1 Initial Temperatures. This test shall be started with both the boiler/heater and the storage at a minimum temperature of 125°F. The boiler/heater maximum temperature at the start of this test shall be 135 °F. The boiler/heater and storage may be heated through a pre-burn or it may be heated by external means.

12.4.2.2 Firebox Condition at Test Start. Prior to the start of this test remove all ash and charcoal from the combustion chamber(s). The loading of the test fuel and kindling should follow the manufacturer's recommendations, subject to the following constraints: Up to 10 percent kindling and paper may be used which is in addition to the fuel load. Further, up to 10 percent of the fuel load (*i.e.,* included in the 10 lb/ft^3) may be smaller than the main fuel. This startup fuel shall still be larger than 2 inches.

12.4.2.3 Storage. The Category I and II test runs shall be done with thermal storage. The initial temperature of the storage must be 125 °F or greater at the start of the test. The storage may be heated during the pre-test burn cycle or it may be heated by external means. Prior to the start of the test run, the storage tank destratification pump, shown in Figure 1, shall be operated until the total volume pumped exceeds 1.5 times the tank volume and the difference between the temperature at the top and bottom of the storage tank (TS_1 and TS_2) is less than 1 °F. These two temperatures shall then be recorded to determine the starting average tank temperature. The total volume pumped may be based on the nominal flow rate of the destratification pump (See section 9.6).

12.5 Test Runs. For all test runs, the return water temperature to the hydronic heater must be equal to or greater than 120 °F (this is lower than the initial tank temperature to allow for any pipeline losses). Where the storage system is used, flow of water from the boiler/heater shall be divided between the storage tank and the heat exchanger such that the temperature change of the circulating water across the heat exchanger shall be 30 ±5 °F, averaged over the entire test run. This is typically adjusted using the system valves.

Complete a test run in each heat output rate category, as follows:

12.5.1 Test Run Start. For Category III and IV runs: Once the appliance is operating normally and the pretest coal bed weight has reached the target value per section 12.4.1, tare the scale and load the full test charge into the appliance. Time for loading shall not exceed 5 minutes. The actual weight of the test fuel charge shall be measured and recorded within 30 minutes prior to loading. Start all sampling systems.

For Category I and II runs: Once the appliance has reached the starting temperature, tare the scale and load the full test charge, including kindling into the appliance. The actual weight of the test fuel charge shall be measured and recorded within 30 minutes prior to loading. Light the fire following the manufacturer's written normal startup procedure. Start all sampling systems.

12.5.1.1 Record all water temperatures, differential water temperatures and water flow rates at time intervals of one minute or less.

12.5.1.2 Record particulate emissions data per the requirements of EPA Method 28WHH and the standards referenced therein.

12.5.1.3 Record data needed to determine overall efficiency (SLM) per the requirements of CSA B415.1–10 (IBR, see § 60.17) clauses 6.2.1, 6.2.2, 6.3, 8.5.7, 10.4.3(a), 10.4.3(f), and 13.7.9.3

12.5.1.3.1 Measure and record the test room air temperature in accordance with the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 6.2.1, 8.5.7 and 10.4.3(g).

12.5.1.3.2 Measure and record the flue gas temperature in accordance with the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 6.2.2, 8.5.7 and 10.4.3(f).

12.5.1.3.3 Determine and record the carbon monoxide (CO) and carbon dioxide (CO_2) concentrations in the flue gas in accordance with CSA B415.1–10 (IBR, see § 60.17), clauses 6.3, 8.5.7 and 10.4.3(i) and (j).

12.5.1.3.4 Measure and record the test fuel weight per the requirements of CSA B415.1–10 (IBR, see § 60.17), clauses 8.5.7 and 10.4.3(h).

12.5.1.3.5 Record the test run time per the requirements of CSA B415.1–10 (IBR, see § 60.17), clause 10.4.3(a).

12.5.1.3.6 Record and document all settings and adjustments, if any, made to the boiler/heater as recommended/required by manufacturer's instruction manual for different combustion conditions or heat loads. These may include temperature setpoints, under and over-fire air adjustment, or other adjustments that could be made by an operator to optimize or alter combustion. All such settings shall be included in the report for each test run.

12.5.1.4 Monitor the average heat output rate on the load side of the heat exchanger based on water temperatures and flow. If the heat output rate over a 10 minute averaging period gets close to the upper or lower limit of the target range (±5 percent), adjust the water flow through the heat exchanger to compensate. Make changes as infrequently as possible while maintaining the target heat output rate. The first test run shall be conducted at the Category IV heat output rate to validate that the appliance is capable of producing the manufacturer's rated heat output capacity.

12.5.2 Test Fuel Charge Adjustment. It is acceptable to adjust the test fuel charge (*i.e.,* reposition) once during a test run if more than 60 percent of the initial test fuel charge weight has been consumed and more than 10

minutes have elapsed without a measurable (1 lb or 0.5 kg) weight change while the operating control is in the demand mode. The time used to make this adjustment shall be less than 60 seconds.

12.5.3 Test Run Completion. For the Category III and IV, ''hot-to-hot'' test runs, the test run is completed when the remaining weight of the test fuel charge is 0.0 lb (0.0 kg). ($W_{FuelBurned} = W_{fuel}$) End the test run when the scale has indicated a test fuel charge weight of 0.0 lb (0.0 kg) or less for 30 seconds.

For the Category I and II ''cold-to-cold'' test runs, the test run is completed; and the end of a test is defined at the first occurrence of any one of the following:

(a) The remaining weight of the test fuel charge is less than 1 percent of the total test fuel weight ($W_{FuelBurned} > 0.99 \cdot W_{fuel}$);

(b) The automatic control system on the boiler/heater switches to an off mode. In this case, the boiler/heater fan (if used) is typically stopped and all air flow dampers are closed by the control system. Note that this off mode cannot be an ''overheat'' or emergency shutdown which typically requires a manual reset; or

(c) If the boiler/heater does not have an automatic off mode: After 90 percent of the fuel load has been consumed and the scale has indicated a rate of change of the test fuel charge of less than 1.0 lb/hr for a period of 10 minutes or longer. Note—this is not considered ''stopped fuel combustion,'' See section 12.5.6.1.

12.5.3.1 At the end of the test run, stop the particulate sampling train and overall efficiency (SLM) measurements, and record the run time, and all final measurement values.

12.5.3.2 At the end of the test run, continue to operate the storage tank destratification pump until the total volume pumped exceeds 1.5 times the tank volume. The maximum average of the top and bottom temperatures measured after this time may be taken as the average tank temperature at the end of the tests (TFSavg, See section 13.1). The total volume pumped may be based on the nominal flow rate of the destratification pump (See section 9.6).

12.5.3.3 For the Category I and II test runs, there is a need to determine the energy content of the unburned fuel remaining in the chamber if the remaining mass in the chamber is greater than 1 percent of the test fuel weight. Following the completion of the test, as soon as safely practical, this remaining fuel is removed from the chamber, separated from the remaining ash and weighed. This separation could be implemented with a slotted ''scoop'' or similar tool. A ¼ inch opening size in the separation tool shall be used to separate the ash and charcoal. This separated char is assigned a heating value of 12,500 Btu/lb.

12.5.4 Heat Output Capacity Validation. The first test run must produce a heat output rate that is within 10 percent of the manufacturer's rated heat output capacity (Category IV) throughout the test run and an average heat output rate within 5 percent of the manufacturer's rated heat output capacity. If the appliance is not capable of producing a heat output within these limits, the manufacturer's rated heat output capacity is considered not validated and testing is to be terminated. In such cases, the tests may be restarted using a lower heat output capacity if requested by the manufacturer. Alternatively, during the Category IV run, if the rated output cannot be maintained for a 15 minute interval, the manufacturer may elect to reduce the rated output to match the test and complete the Category IV run on this basis. The target outputs for Categories I, II, and III shall then be recalculated based on this change in rated output capacity.

12.5.5 Additional Test Runs. Using the manufacturer's rated heat output capacity as a basis, conduct a test for additional heat output categories as specified in section 4.3. It is not required to run these tests in any particular order.

12.5.6 Alternative Heat Output Rate for Category I. If an appliance cannot be operated in the Category I heat output range due to stopped combustion, two test runs shall be conducted at heat output rates within Category II. When this is the case, the weightings for the weighted averages indicated in section 14.1.15 shall be the average of the Category I and II weighting's and shall be applied to both Category II results. Appliances that are not capable of operation within Category II (<25 percent of maximum) cannot be evaluated by this test method.

12.5.6.1 Stopped Fuel Combustion. Evidence that an appliance cannot be operated at a Category I heat output rate due to stopped fuel combustion shall include documentation of two or more attempts to operate the appliance in heat output rate Category I and fuel combustion has stopped prior to complete consumption of the test fuel charge. Stopped fuel combustion is evidenced when an elapsed time of 60 minutes or more has occurred without a measurable (1 lb or 0.5 kg) weight change in the test fuel charge while the appliance operating control is in the demand mode. Report the evidence and the reasoning used to determine that a test in heat output rate Category I cannot be achieved. For example, two unsuccessful attempts to operate at an output rate of 10 percent of the rated output capacity are not sufficient evidence that heat output rate Category I cannot be achieved.

12.5.7 Appliance Overheating. Appliances with their associated thermal storage shall be capable of operating in all heat output categories without overheating to be rated by this test method. Appliance overheating occurs when the rate of heat withdrawal from the appliance is lower than the rate of heat production when the unit control is in the idle mode. This condition results in the water in the appliance continuing to increase in temperature well above the upper limit setting of the operating control. Evidence of overheating includes: 1 hour or more of appliance water temperature increase above the upper temperature set-point of the operating control, exceeding the temperature limit of a safety control device (independent from the operating control—typically requires manual reset), boiling water in a non-pressurized system or activation of a pressure or temperature relief valve in a pressurized system.

12.5.8 Option to Eliminate Tests in Category II and III. Following successful completion of a test run in Category I, the manufacturer may eliminate the Category II and III tests. For the purpose of calculating the annual averages for particulates and efficiency, the values obtained in the Category I run shall be assumed to apply also to Category II and Category III. It is envisioned that this option would be applicable to systems which have sufficient thermal storage such that the fuel load in the Category I test can be completely consumed without the system reaching its upper operating temperature limit. In this case, the boiler/heater would likely be operating at maximum thermal output during the entire test and this output rate may be higher than the manufacturer's rated heat output capacity. The Category II and III runs would then be the same as the Category I run. It may be assumed that the particulate emission values and efficiency values determined in the startup, steady-state, and end phases of Category I are applicable in Categories II and III, for the purpose of determining the annual averages in lb/mmBtu and g/MJ (See section 13). For the annual average in g/hr, the length of time for stored heat to be drawn from thermal storage shall be determined for the test load requirements of the respective category.

12.5.9 Modification to Measurement Procedure in EPA Method 28WHH to Determine Emissions Separately During the Startup, Steady-State and End Phases. With one of the two particulate sampling trains used, filter changes shall be made at the end of the startup phase and the steady-state phase (See section 3.0). This shall be done to determine the particulate emission rate and particulate emission index for the startup, steady-state, and end phases individually. For this one train, the particulates measured during each of these three phases shall be added together to also determine the particulate emissions for the whole run.

12.5.10 Modification to Measurement Procedure in EPA Method 28WHH and the Standards Referenced therein on Averaging Period for Determination of Efficiency by the Stack Loss Method. The methods currently defined in Method 28WHH allow averaging over 10-minute time periods for flue gas temperature, flue gas CO_2, and flue gas CO for the determination of the efficiency with the stack loss method. However, under some cycling conditions the ''on'' period may be short relative to this 10-minute period. For this reason, during cycling operation the averaging period for these parameters may not be longer than the burner on period divided by 10. The averaging period need not be shorter than one minute. During the off period, under cycling operation, averaging periods as specified in EPA Method 28WHH and the standards referenced therein, may be used. Where short averaging times are used, however, the averaging period for fuel consumption may still be at 10 minutes. This average wood consumption rate shall be applied to all of the smaller time intervals included.

12.6 Additional Test Runs. The testing laboratory may conduct more than one test run in each of the heat output categories

specified in section 4.3. If more than one test run is conducted at a specified heat output rate, the results from at least two-thirds of the test runs in that heat output rate category shall be used in calculating the weighted average emission rate. The measurement data and results of all test runs shall be reported regardless of which values are used in calculating the weighted average emission rate.

13.0 Calculation of Results

13.1 Nomenclature

CO_s—Carbon monoxide measured in the dilution tunnel at arbitrary time in ppm dry basis.

$CO_{g/min}$—Carbon monoxide emission rate in g/min.

CO_T—Total carbon monoxide emission for the full test run in grams.

CO_{1}—Startup period carbon monoxide emissions in grams.

CO_{2}—Steady-state period carbon monoxide emission in grams.

CO_{3}—End period carbon monoxide emission in grams.

E_T—Total particulate emissions for the full test run as determined per EPA Method 28WHH and the standards referenced therein in grams.

E_1—Startup period particulate emissions in grams.

E_2—Steady-state period particulate emissions in grams.

E_3—End period particulate emissions in grams.

$E_{1_g/kg}$—Startup period particulate emission index in grams per kg fuel.

$E_{2_g/kg}$—Steady-state period particulate emission index in grams per kg fuel.

$E_{3_g/kg}$—End period particulate emission index in grams per kg fuel.

$E_{1_g/hr}$—Startup period particulate emission rate in grams per hour.

$E_{2_g/hr}$—Steady-state period particulate emission rate in grams per hour.

$E_{3_g/hr}$—End period particulate emission rate in grams per hour.

$E_{g/MJ}$—Emission rate in grams per MJ of heat output.

$E_{lb/mmBtu\ output}$—Emissions rate in pounds per million Btu of heat output.

$E_{g/kg}$—Emissions factor in grams per kilogram of dry fuel burned.

$E_{g/hr}$—Emission factor in grams per hour.

HHV—Higher heating value of fuel = 8600 Btu/lb (19.990 MJ/kg).

LHV—Lower heating value of fuel = 7988 Btu/lb (18.567 MJ/kg).

ΔT—Temperature difference between cooling water entering and exiting the heat exchanger.

Q_{out}—Total heat output in Btu (MJ).

Q_{in}—Total heat input available in test fuel charge in Btu's (MJ).

Q_{std}—Volumetric flow rate in dilution tunnel in dscfm.

M—Mass flow rate of water in lb/min (kg/min).

V_i—Volume of water indicated by a totalizing flow meter at the i_{th} reading in gallons (liters).

V_f—Volumetric flow rate of water in heat exchange system in gallons per minute (liters/min).

Θ—Total length of burn period in hours ($\Theta_1 + \Theta_2 + \Theta_3$).

Θ_1—Length of time of the startup period in hours.

Θ_2—Length of time of the steady-state period in hours.

Θ_3—Length of time of the end period in hours.

Θ_4—Length of time for stored heat to be used following a burn period in hours.

t_i—Data sampling interval in minutes.

η_{del}—Delivered heating efficiency in percent.

F_i—Weighting factor for heat output category i. (See Table 2.)

T1—Temperature of water at the inlet on the supply side of the heat exchanger, °F.

T2—Temperature of the water at the outlet on the supply side of the heat exchanger, °F.

T3—Temperature of cooling water at the inlet to the load side of the heat exchanger, °F.

T4—Temperature of cooling water at the outlet of the load side of the heat exchanger, °F.

T5—Temperature of the hot water supply as it leaves the boiler/heater, °F.

T6—Temperature of return water as it enters the boiler/heater, °F.

T7—Temperature in the boiler/heater optional destratification loop at the top of the boiler/heater, °F.

T8—Temperature in the boiler/heater optional destratification loop at the bottom of the boiler/heater, °F.

TI_{avg}—Average temperature of the appliance and water at start of the test.

$$TI_{avg} - (T5 + T6)/2 \text{ at the start of the test, °F.} \qquad \text{Eq. 1}$$

TF_{avg}—Average temperature of the appliance and water at the end of the test.

$$TF_{avg} - (T5 + T6)/2 \text{ at the end of the test, °F.} \qquad \text{Eq. 2}$$

TIS_1—Temperature at the inlet to the storage system at the start of the test.

TIS_2—Temperature at the outlet from the storage system at the start of the test.

TFS_1—Temperature at the inlet to the storage system at the end of the test.

TFS_2—Temperature at the outlet from the storage system at the end of the test.

TIS_{avg}—Average temperature of the storage system at the start of the test.

$$TIS_{avg} - (TIS_1 + TIS_2)/2 \text{ at the end of the test.} \qquad \text{Eq. 3}$$

TFS_{avg}—Average temperature of the storage system at the end of the test.

$$TFS_{avg} - (TFS_1 + TFS_2)/2. \qquad \text{Eq. 4}$$

MC—Fuel moisture content in percent dry basis.

σ—Density of water in pounds per gallon.

$\sigma_{Initial}$—Density of water in the boiler/heater system at the start of the test in pounds per gallons.

$\sigma_{boiler/heater}$—Density of water in the boiler/heater system at an arbitrary time during the test in pounds per gallon.

C_p—Specific heat of water in Btu/lb, °F.

C_{steel}—Specific heat of steel (0.1 Btu/lb, °F).

$V_{boiler/heater}$—total volume of water in the boiler/heater system on the weight scale in gallons.

W_{fuel}—Fuel charge weight, as-fired or ''wet'', in pounds (kg).

W_{fuel_1}—Fuel consumed during the startup period in pounds (kg).

W_{fuel_2}—Fuel consumed during the steady state period in pounds (kg).

W_{fuel_3}—Fuel consumed during the end period in pounds (kg).

$W_{FuelBurned}$—Weight of fuel that has been burned from the start of the test to an arbitrary time, including the needed correction for the change in density and weight of the water in the boiler/heater system on the scale in pounds (kg).

$W_{RemainingFuel}$—Weight of unburned fuel separated from the ash at the end of a test. Useful only for Category I and Category II tests.

W_{app}—Weight of empty appliance in pounds (kg).

W_{wat}—Weight of water in supply side of the system in pounds (kg).

$W_{ScaleInitial}$—Weight reading on the scale at the start of the test, just after the test load has been added in pounds (kg).

W_{Scale}—Reading of the weight scale at an arbitrary time during the test run in pounds (kg).

$W_{StorageTank}$—Weight of the storage tank empty in pounds (kg).

$W_{WaterStorage}$—Weight of the water in the storage tank at TIS_{avg} in pounds (kg).

13.2 After the test is completed, determine the particulate emissions E_T in accordance with EPA Method 28WHH and the standards referenced therein.

13.3 Determination of the weight of fuel that has been burned at an arbitrary time.

For the purpose of tracking the consumption of the test fuel load during a test run the following may be used to calculate the weight of fuel that burned since the start of the test:

$$W_{FuelBurned} = (W_{ScaleInitial} - W_{Scale}) + V_{Boiler/heater} \cdot (\sigma_{Initial} - \sigma_{boiler/heater}) \quad \text{Eq. 5}$$

Water density, σ, is calculated using Equation 12.

13.4 Determine Average Fuel Load Moisture Content.

$$MC = \frac{\sum W_{SliceWet_i} - MC_{Slice\ i}}{\sum W_{SliceWet_i}} \quad \text{Eq. 6}$$

13.5 Determine Heat Input.

$$Q_{in} = (W_{fuel}/(1+(MC/100))) \text{ x HHV, Btu (MJ).} \quad \text{Eq. 7}$$

$$Q_{in\ LHV} = (W_{fuel}/(1+(MC/100))) \text{ x LHV, Btu (MJ).} \quad \text{Eq. 8}$$

13.5.1 Correction to Q_{in} for the Category I and II tests, where there is greater than 1 percent of the test fuel charge in the chamber at the end of the test period.

$$Q_{InCorrected} = Q_{in} - W_{Remaining} \cdot 12{,}500\ \underline{Btu} \quad \text{Eq. 9}$$

13.6 Determine Heat Output, Efficiency, and Emissions.

13.6.1 Determine heat output as:

Q_{out} = Σ [Heat output determined for each sampling time interval] + Change in heat stored in the appliance + Change in heat in storage tank.

$$Qout = \Sigma[C_{pi} \cdot \Delta T_i \cdot M_i \cdot t_i] + (W_{app} \cdot C_{steel} + W_{water} \cdot C_{pa}) \cdot (TF_{avg} - TI_{avg})$$

$$+ (W_{StorageTank} \cdot C_{steel} + W_{WaterStorage} \cdot C_{pa}) \cdot (TFS_{avg} - TIS_{avg}) \text{ Btu (MJ)} \quad \text{Eq. 10}$$

Note: The subscript (i) indicates the parameter value for sampling time interval t_i.

M_i = Mass flow rate = gal/min × density of water (lb/gal) = lb/min.

$$M_i = V_{fi} \cdot \sigma_i \text{, lb/min.} \quad \text{Eq. 11}$$

$$\sigma_i = (62.56 + (-.0003413 \text{ x } T3_i) + (-.00006225 \text{ x } T3_i^2))\ 0.1337 \text{, lb/gal.} \quad \text{Eq. 12}$$

$$C_p = 1.0014 + (-.000003485 \text{ x } T3_i) \text{ Btu/lb, -°F.} \quad \text{Eq. 13}$$

C_{steel} = 0.1 Btu/lb, -° F.

$$C_{pa} = 1.0014 + (-.000003485 \text{ X } (TI_{avg} + TF_{avg})/2) \text{, Btu/lb, °F.} \quad \text{Eq. 14}$$

$$V_{fi} = (V_i - V_{i-1})/(t_i - t_{i-1}) \text{, gal/min.} \quad \text{Eq. 15}$$

Note: V_i is the total water volume at the end of interval i and V_{i-1} is the total water volume at the beginning of the time interval. This calculation is necessary when a totalizing type water meter is used.

13.6.2 Determine Heat Output Rate Over Burn Period ($\Theta_1 + \Theta_2 + \Theta_3$) as:

$$\text{Heat Output Rate} = Q_{out}/\Theta, \text{ Btu/hr (MJ/hr).} \quad \text{Eq. 16}$$

13.6.3 Determine Emission Rates and Emission Factors as:

$$E_{g/MJ} = E_T/(Q_{out} \times 0.001055), \text{ g/MJ.} \quad \text{Eq. 17}$$

$$E_{lb/MM\ Btu\ output} = (E_T/453.59)/(Q_{out} \times 10^{-6}), \text{ lb/mmBtu out.} \quad \text{Eq. 18}$$

$$E_{g/kg} = E_T/(W_{fuel}/(1+MC/100)), \text{ g/dry kg.} \quad \text{Eq. 19}$$

$$E_{g/hr} = E_T/(\Theta_1 + \Theta_2 + \Theta_3 + \Theta_4), \text{ g/hr.} \quad \text{Eq. 20}$$

$$\Theta_4 = (W_{StorageTank} \cdot C_{steel} + W_{WaterStorage} \cdot C_{pa}) \cdot (TFS_{avg} - TIS_{avg})/(Q_{out}/\Theta) \quad \text{Eq. 21}$$

If thermal storage is not used in a Category III or IV run, then $\Theta_4 = 0$.

$E_{1_g/kg} = E_1/(W_{fuel_1}/(1 + MC/100))$, g/dry kg.

$E_{2_g/kg} = E_2/(W_{fuel_2}/(1 + MC/100))$, g/dry kg.

$E_{3_g/kg} = E_3/(W_{fuel_3}/(1 + MC/100))$, g/dry kg.

$E_{1_g/hr} = E_1/\Theta_1$, g/hr.

$E_{2_g/hr} = E_2/\Theta_2$, g/hr.

$E_{3_g/hr} = E_3/\Theta_3$, g/hr.

13.6.4 Determine delivered efficiency as:

$$\eta_{del} = (Q_{out}/Q_{InCorrected}) \times 100, \%. \quad \text{Eq. 22}$$

$$\eta_{del\ LHV} = (Q_{out}/Q_{in\ LHV}) \times 100, \%. \quad \text{Eq. 23}$$

13.6.5 Determine η_{SLM}—Overall Efficiency, also known as Stack Loss Efficiency, using stack loss method (SLM).

For determination of the average overall thermal efficiency (η_{SLM}) for the test run, use the data collected over the full test run and the calculations in accordance with CSA B415.1–10 (IBR, see § 60.17), clause 13.7 except for 13.7.2(e), (f), (g), and (h), use the following average fuel properties for oak: %C = 50.0, %H = 6.6, %O = 43.2, %Ash = 0.2.

13.6.5.1 Whenever the CSA B415.1–10 (IBR, see § 60.17) overall efficiency is found to be lower than the overall efficiency based on load side measurements, as determined by Eq. 22 of this method, section 14.1.7 of the test report must include a discussion of the reasons for this result. For a test where the CSA B415.1–10 overall efficiency SLM is less than 2 percentage points lower than the overall efficiency based on load side measurements, the efficiency based on load side measurements shall be considered invalid. [Note on the rationale for the 2 percentage points limit. The SLM method does not include boiler/heater jacket losses and, for this reason, should provide an efficiency which is actually higher than the efficiency based on the energy input and output measurements or ''delivered efficiency.'' A delivered efficiency that is higher than the efficiency based on the SLM could be considered suspect. A delivered efficiency greater than 2 percentage points higher than the efficiency based on the SLM, then, clearly indicates a measurement error.]

13.6.6 Carbon Monoxide Emissions

For each minute of the test period, the carbon monoxide emission rate shall be calculated as:

$$CO_{g/min} = Q_{std} \cdot CO_s \cdot 3.30 \times 10^{-5} \quad \text{Eq. 24}$$

Total CO emissions for each of the three test periods (CO_1, CO_2, CO_3) shall be calculated as the sum of the emission rates for each of the 1-minute intervals. Total CO emission for the test run, CO_T, shall be calculated as the sum of CO_1, CO_2, and CO_3.

13.7 Weighted Average Emissions and Efficiency.

13.7.1 Determine the weighted average emission rate and delivered efficiency from the individual tests in the specified heat output categories. The weighting factors (F_i) are derived from an analysis of ASHRAE bin data which provides details of normal building heating requirements in terms of percent of design capacity and time in a particular capacity range—or ''bin''—over the course of a heating season. The values used in this method represent an average of data from several cities located in the northern United States.

$$\text{Weighted average delivered efficiency: } \eta_{avg} = \Sigma\, \eta_i \times F_i, \%. \quad \text{Eq. 25}$$

$$\text{Weighted average emissions: } E_{avg} = \Sigma\, E_i \times F_i, \% \quad \text{Eq. 26}$$

If, as discussed in section 12.5.8, the option to eliminate tests in Category II and III is elected, the values of efficiency and particulate emission rate as measured in Category I, shall be assigned also to Category II and III for the purpose of determining the annual averages.

14.0 Report

14.1.1 The report shall include the following:

14.1.2 Name and location of the laboratory conducting the test.

14.1.3 A description of the appliance tested and its condition, date of receipt and dates of tests.

14.1.4 A description of the minimum amount of external thermal storage that is required for use with this system. This shall be specified both in terms of volume in gallons and stored energy content in Btu with a storage temperature ranging from 125 °F to the manufacturer's specified setpoint temperature.

14.1.5. A statement that the test results apply only to the specific appliance tested.

14.1.6 A statement that the test report shall not be reproduced except in full, without the written approval of the laboratory.

14.1.7 A description of the test procedures and test equipment including a schematic or other drawing showing the location of all required test equipment. Also, a description of test fuel sourcing, handling and storage practices shall be included.

14.1.8 Details of deviations from, additions to or exclusions from the test method, and their data quality implications on the test results (if any), as well as information on specific test conditions, such as environmental conditions.

14.1.9 A list of participants and their roles and observers present for the tests.

14.1.10 Data and drawings indicating the fire box size and location of the fuel charge.

14.1.11 Drawings and calculations used to determine firebox volume.

14.1.12 Information for each test run fuel charge including piece size, moisture content and weight.

14.1.13 All required data and applicable blanks for each test run shall be provided in spreadsheet format both in the printed report and in a computer file such that the data can be easily analyzed and calculations easily verified. Formulas used for all calculations shall be accessible for review.

14.1.14 For each test run, Θ_1,Θ_2, Θ_3, the total CO and particulate emission for each of these three periods, and Θ_4.

14.1.15 Calculated results for delivered efficiency at each heat output rate and the weighted average emissions reported as total emissions in grams, pounds per mm Btu of delivered heat, grams per MJ of delivered heat, grams per kilogram of dry fuel and grams per hour. Results shall be reported for each heat output category and the weighted average.

14.1.16 Tables 1A, 1B, 1C, 1D, 1E and Table 2 must be used for presentation of results in test reports.

14.1.17 A statement of the estimated uncertainty of measurement of the emissions and efficiency test results.

14.1.18 A plot of CO emission rate in grams/minute vs. time, based on 1 minute averages, for the entire test period, for each run.

14.1.19 A plot of estimated boiler/heater energy release rate in Btu/hr based on 10 minute averages, for the entire test period, for each run. This will be calculated from the fuel used, the wood heating value and moisture content, and the SLM efficiency during each 10 minute period.

14.1.20 Raw data, calibration records, and other relevant documentation shall be retained by the laboratory for a minimum of 7 years.

15.0 Precision and Bias

15.1 Precision—It is not possible to specify the precision of the procedure in this test method because the appliance operation and fueling protocols and the appliances themselves produce variable amounts of emissions and cannot be used to determine reproducibility or repeatability of this test method.

15.2 Bias—No definitive information can be presented on the bias of the procedure in this test method for measuring solid fuel burning hydronic heater emissions because no material having an accepted reference value is available.

16.0 Keywords

16.1 Solid fuel, hydronic heating appliances, wood-burning hydronic heaters, partial thermal storage.

Table 1A. Data Summary Part A

						Θ	W_{fuel}	MC_{ave}	Q_{in}	Q_{out}
Category	Run No	Load % Capacity	Target Load	Actual Load	Actual Load	Test Duration	Wood Weight as-fired	Wood Moisture	Heat Input	Heat Output
		Btu/hr	Btu/hr	Btu/hr	% of max	hrs	lb	%DB	Btu	Btu
I		< 15% of max								
II		16-24% of max								
III		25-50% of max								
IV		Max capacity								

Table 1B. Data Summary Part B

			T2 Min	E_T	E	E	$E_{g/hr}$	$E_{g/kg}$	η_{del}	H_{SLM}
Category	Run No	Load % Capacity	Min Return Water Temp.	Total PM Emissions	PM Output Based	PM Output Based	PM Rate	PM Factor	Delivered Efficiency	Stack Loss Efficiency
			°F	g	lb/mm Btu Out	g/MJ	g/hr	g/kg	%	%
I		< 15% of max								
II		16-24% of max								
III		25-50% of max								
IV		Max capacity								

Table 1C. Data Summary Part C

			Θ_1	Θ_2	Θ_3	$CO_{_1}$	$CO_{_2}$	$CO_{_3}$	CO_T
Category	Run No	Load % Capacity	Startup Time.	Steady State Time	End Time	Startup CO emission	Steady State CO emission	End CO emission	Total CO emission
			min	min	min	g	g	g	g
I		< 15% of max							
II		16-24% of max							
III		25-50% of max							
IV		Max capacity							

Table 1D. Data Summary Part D

			E_1	E_2	E_3	$E_{1_g/kg}$	$E_{2_g/kg}$	$E_{3_g/kg}$
Category	Run No	Load % Capacity	Startup PM	Steady State PM	End PM	Startup PM emission index	Steady State PM emission index	End PM emission index
			g	g	g	g/kg fuel	g/kg fuel	g/kg fuel
I		< 15% of max						
II		16-24% of max						
III		25-50% of max						
IV		Max capacity						

Table 1E: Label Summary Information

MANUFACTURER:			
MODEL NUMBER:			
ANNUAL EFFICIENCY RATING:	η_{avg}		**(Using higher heating value)**
PARTICLE EMISSIONS:	E_{avg}		grams/hr (Average)
			lbs/mmBtu/hr Output

Table 2. Annual Weighting

Category	Weighting Factor (F_i)	$\eta_{del,i}$ x F_i	$E_{g/MJ,i}$ x F_i	$E_{g/kg,i}$ x F_i	$E_{lb/mmBtu\ Out,i}$ x F_i	$E_{g/hr,i}$ x F_i
I	0.437					
II	0.238					
III	0.275					
IV	0.050					
Totals	1.000					

Figure 1. Schematic of Equipment Test Setup

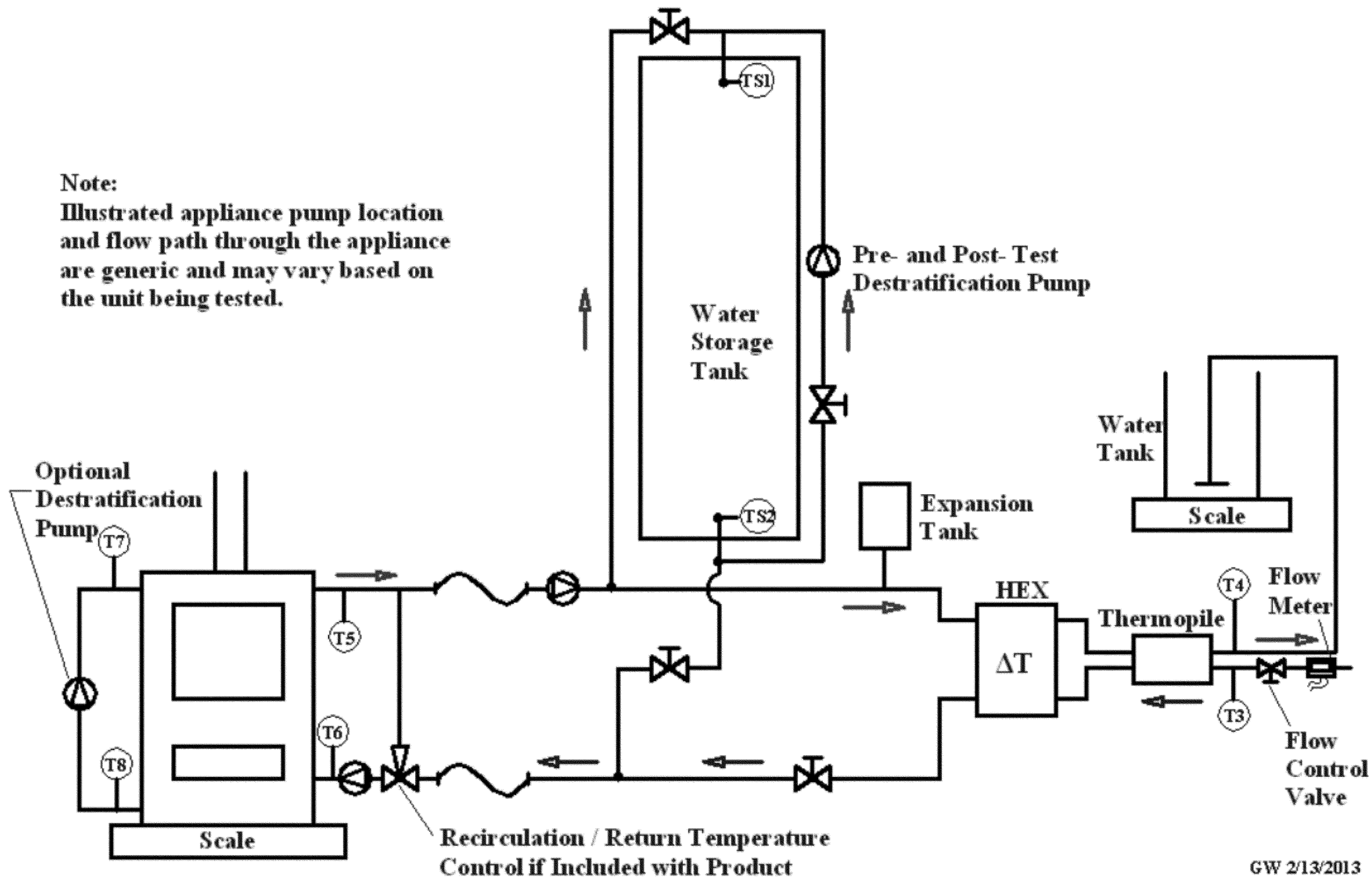
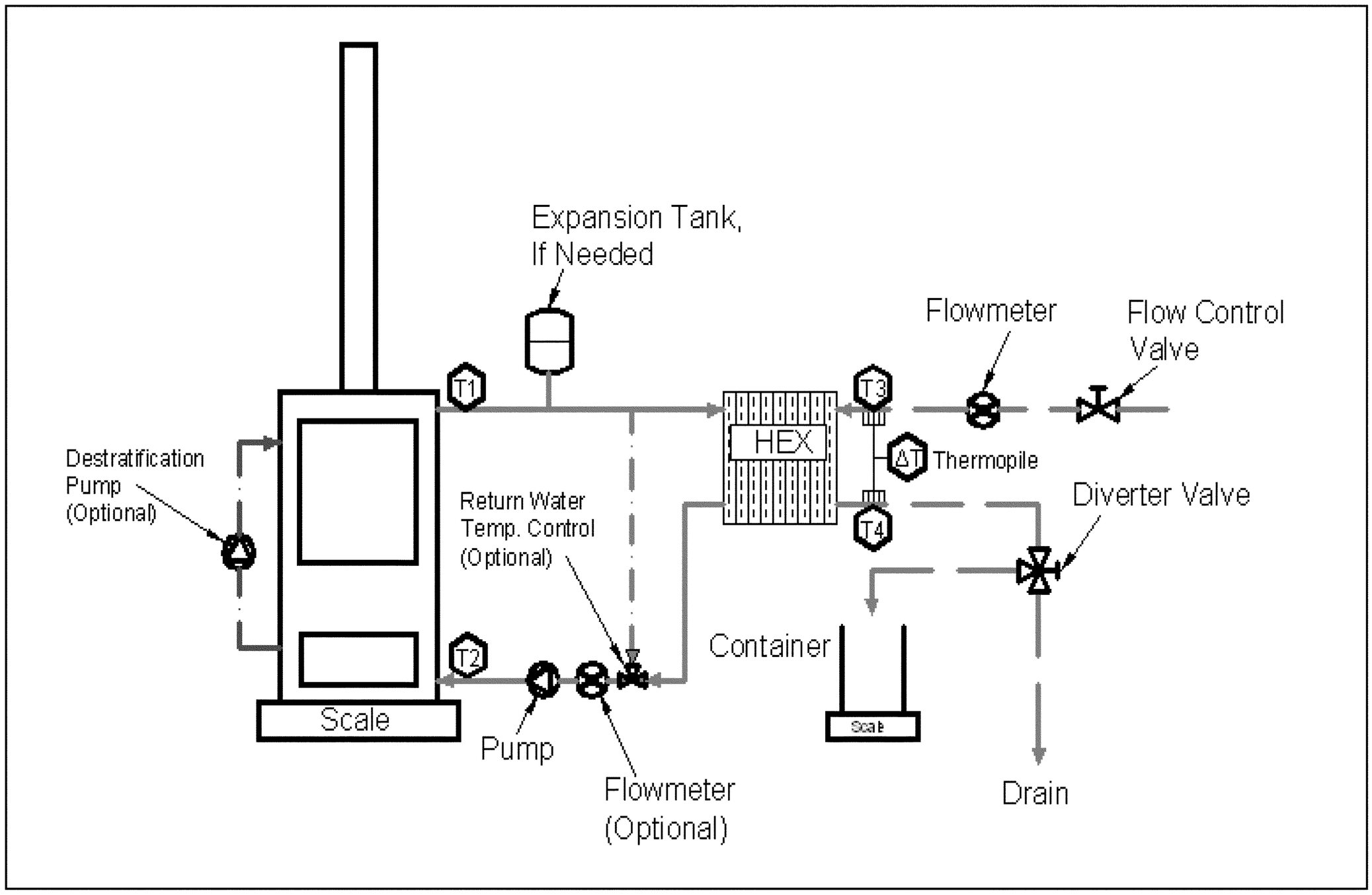


Figure 2. Schematic of Test Equipment Set-up



Note: Illustrated appliance pump location and flow path through the appliance.

■ 7. Appendix I to Part 60 is revised to read as follows:

Appendix I to Part 60—Owner's Manuals and Temporary Labels for Wood Heaters Subject to Subparts AAA and QQQQ of Part 60

1. Introduction

The purpose of this appendix is to provide specific instructions and examples to manufacturers for compliance with the owner's manual provisions of subparts AAA and QQQQ of this part.

2. Instructions for Preparation of Wood Heater Owner's Manuals

2.1 Introduction

Although the owner's manuals do not require premarket approval, EPA will monitor the contents to ensure that sufficient information is included to provide heater proper operation and maintenance information affecting emissions to consumers. The manufacturer must make current and historical owner's manuals available on the company Web site and upon request to the EPA. The purpose of this section is to provide instructions to manufacturers for compliance with the owner's manual provisions of § 60.536(g) of subpart AAA that applies to wood heaters and § 60.5478(f) of subpart QQQQ that applies to hydronic heaters and forced-air furnaces. A checklist of topics and illustrative language is provided as instructions. Owner's manuals should be tailored to specific wood heater models, as appropriate.

2.2 Topics Required To Be Addressed in Owner's Manual

(a) Wood heater description and compliance status;

(b) Tamper warnings;

(c) Overall heater warranty information and catalyst information and warranty (if catalyst-equipped);

(d) Fuel selection;

(e) Achieving and maintaining catalyst light-off (if catalyst-equipped);

(f) Catalyst monitoring (if catalyst-equipped);

(g) Troubleshooting catalytic-equipped heaters (if catalyst-equipped);

(h) Catalyst replacement (if catalyst-equipped);

(i) Wood heater proper operation and maintenance, including minimizing visible emissions;

(j) Wood heater proper installation, including location, stack height and achieving proper draft;

(k) Use of smoke detectors and carbon monoxide monitors; and

(l) Efficiency.

2.3 Sample Text/Descriptions

(a) The following are example texts and/or further descriptions illustrating the topics identified above. Although the regulation requires manufacturers to address (where applicable) the 10 topics identified above, the exact language is not specified. Manuals should be written specific to the model and design of the wood heater. The following instructions are composed of generic descriptions and texts.

(b) If manufacturers choose to use the language provided in the example, the portion in italics should be revised as appropriate. Any manufacturer electing to use the EPA example language will be considered to be in compliance with owner's manual requirements provided that the particular language is printed in full with only such changes as are necessary to ensure accuracy.

Example language is not provided for certain topics, since these areas are generally heater specific. For these topics, manufacturers should develop text that is specific to the proper operation and maintenance of their particular products.

2.3.1 Wood Heater Description and Compliance Status

Owner's manuals must include:

(a) Manufacturer and model;

(b) Compliance status (2015 standard, 2016 standard, 2017 standard, 2020 standard, crib wood standard or cord wood alternative standard, last allowable sell date, etc.); and

(c) Heat output range.

Exhibit 1—Example Text covering 2.3.1(a), (b), and (c) of this appendix:

''This manual describes the installation and operation of the Brand X, Model 0 catalytic equipped wood heater. This heater meets the *2015* U.S. Environmental Protection Agency's crib wood emission limits for wood heaters sold after May 15, 2015. Under specific test conditions this heater has been shown to deliver heat at rates ranging from *8,000* to *35,000* Btu/hr.''

2.3.2 Tamper Warnings

(a) The following statement must be included in the owner's manual for all units:

''This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.''

(b) The following statement must be included in the owner's manual for catalyst-equipped units:

''This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual, or if the catalytic element is deactivated or removed.''

2.3.3 Overall Heater Warranty Information and Catalyst Information and Warranty (if catalyst-equipped)

The following information must be included with or supplied in the owner's and warranty manuals:

(a) Manufacturer and model, including catalyst if catalyst-equipped;

(b) Warranty details, including catalyst if catalyst-equipped; and

(c) Instructions for warranty claims.

Exhibit 2—Example Text covering 2.3.3(a), (b), and (c) of this appendix for catalysts:

''The combustor supplied with this heater is a *Brand Z, Long Life Combustor.* Consult the catalytic combustor warranty also supplied with this wood heater. Warranty claims should be addressed to:

Stove or Catalyst Manufacturer _____

Address _____

Phone #_____''

2.3.3.1 This section should also provide clear instructions on how to exercise the warranty (how to package parts for return shipment, etc.).

2.3.4 Fuel Selection

Owner's manuals must include:

(a) Instructions on acceptable fuels;

(b) Warning against inappropriate fuels; and

(c) How to determine seasoned wood compared to unseasoned wood, how to use moisture meters and other techniques and the importance of seasoned wood.

Exhibit 3—Example Text covering 2.3.4(a) and (b) of this appendix:

''This heater is designed to burn natural wood only. Higher efficiencies and lower emissions generally result when burning air dried seasoned hardwoods, as compared to softwoods or to green or freshly cut hardwoods. DO NOT BURN:

(1) Garbage;

(2) Lawn clippings or yard waste;

(3) Materials containing rubber, including tires;

(4) Materials containing plastic;

(5) Waste petroleum products, paints or paint thinners, or asphalt products;

(6) Materials containing asbestos;

(7) Construction or demolition debris;

(8) Railroad ties or pressure-treated wood;

(9) Manure or animal remains;

(10) Salt water driftwood or other previously salt water saturated materials;

(11) Unseasoned wood; or

(12) Paper products, cardboard, plywood, or particleboard. The prohibition against burning these materials does not prohibit the use of fire starters made from paper, cardboard, saw dust, wax and similar substances for the purpose of starting a fire in an affected wood heater.

Burning these materials may result in release of toxic fumes or render the heater ineffective and cause smoke.''

2.3.5 Achieving and Maintaining Catalyst Light-Off

Owner's manuals must describe in detail proper procedures for:

(a) Operation of catalyst bypass (stove specific);

(b) Achieving catalyst light-off from a cold start; and

(c) Achieving catalyst light-off when refueling.

2.3.5.1 No example text is supplied for describing operation of catalyst bypass mechanisms (Item 2.3.5(a) of this appendix) since these are typically stove-specific. Manufacturers must provide instructions specific to their model describing:

(1) Bypass position during startup;

(2) Bypass position during normal operation; and

(3) Bypass position during reloading.

Exhibit 4—Example Text for Item 2.3.5(b) of this appendix:

''The temperature in the stove and the gases entering the combustor must be raised to between *500*° to *700* °F for catalytic activity to be initiated. During the startup of a cold stove, a medium to high firing rate must be maintained for about *20* minutes. This ensures that the stove, catalyst, and fuel are all stabilized at proper operating temperatures. Even though it is possible to have gas temperatures reach *600* °F within *2* to *3* minutes after a fire is started, if the fire is allowed to die down immediately, it may go out or the combustor may stop working. Once the combustor starts working, heat generated in it by burning the smoke will keep it working.''

Exhibit 5—Example Text for Item 2.3.5(c) of this appendix:

''REFUELING: During the refueling and rekindling of a cool fire, or a fire that has burned down to the charcoal phase, operate the stove at a medium to high firing rate for about *10* minutes to ensure that the catalyst reaches approximately *600* °F.''

2.3.6 Catalyst Monitoring

Owner's manuals must include:

(a) Recommendation to visually inspect combustor at least three times during the heating season;

(b) Discussion on expected combustor temperatures for monitor-equipped units; and

(c) Suggested monitoring and inspection techniques and importance of ensuring catalyst is operating properly.

Exhibit 6—Example Text covering 2.3.6(a), (b) and (c) of this appendix:

''It is important to periodically monitor the operation of the catalytic combustor to ensure that it is functioning properly and to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency, and an increase in creosote and emissions. Following is a list of items that should be checked on a periodic basis:

- Combustors should be visually inspected at least three times during the heating season to determine if physical degradation has occurred. Actual removal of the combustor is not recommended unless more detailed inspection is warranted because of decreased performance. If any of these conditions exists, refer to Catalyst Troubleshooting section of this owner's manual.
- This catalytic (*or hybrid*) heater is equipped with a temperature probe to monitor catalyst operation. Properly functioning combustors typically maintain temperatures in excess of *500* °F, and often reach temperatures in excess of *1,000* °F. If catalyst temperatures are not in excess of *500* °F, refer to Catalyst Troubleshooting section of this owner's manual.
- You can get an indication of whether the catalyst is working by comparing the amount of smoke leaving the chimney when the smoke is going through the combustor and catalyst light-off has been achieved, to the amount of smoke leaving the chimney when the smoke is not routed through the combustor (bypass mode).

Step 1—Light stove in accordance with instructions in section 3.3.5.

Step 2—With smoke routed through the catalyst, go outside and observe the emissions leaving the chimney.

Step 3—Engage the bypass mechanism and again observe the emissions leaving the chimney.

Significantly more smoke will be seen when the exhaust is not routed through the combustor (bypass mode).''

2.3.7 Catalyst Troubleshooting

The owner's manual must provide clear descriptions of symptoms and remedies to common combustor problems and importance. It is recommended that photographs of catalyst peeling, plugging, thermal cracking, mechanical cracking, and masking be included in the manual to aid the consumer in identifying problems and to provide direction for corrective action.

2.3.8 Catalyst Replacement

The owner's manual must provide clear step-by-step instructions on how to remove and replace the catalytic combustor. The section should include diagrams and/or photographs.

2.3.9 Wood Heater Proper Operation and Maintenance

The owner's manual must provide clear descriptions of symptoms and remedies to

common heater problems and importance. The owner's manual information must be adequate to enable consumers to achieve optimal emissions performance. Such information must be consistent with the operating instructions provided by the manufacturer to the approved test laboratory for operating the wood heater during certification testing, except for details of the certification test that would not be relevant to the user.

Owner's manual must include:

(a) Recommendations about building and maintaining a fire, especially for cold starts and the effectiveness of the top-down approach for starting fires;

(b) Instruction on proper use of air controls, including how to establish good combustion and how to ensure good combustion at the lowest burn rate for which the heater is warranted;

(c) Ash removal and disposal;

(d) Instruction replacement of gaskets, air tubes and other parts that are critical to the emissions performance of the unit, and other maintenance and repair instructions;

(e) Warning against overfiring; and

(f) Suggested monitoring and inspection techniques and importance of ensuring heater is operating properly, including ensuring visible emissions are minimized.

2.3.9.1 No example text is supplied for 2.3.9(a), (b), (d) and (f) of this appendix since these items are model specific. Manufacturers should provide detailed instructions on building and maintaining a fire including selection of fuel pieces, fuel quantity and stacking arrangement. Manufacturers should also provide instruction on proper air settings (both primary and secondary) for attaining minimum and maximum heat outputs and any special instructions for operating thermostatic controls. Step-by-step instructions on inspection and replacement of gaskets should also be included. Manufacturers should provide diagrams and/or photographs to assist the consumer. Gasket type and size should be specified.

Exhibit 7—Example Text for Item 2.3.9(c) of this appendix:

"Whenever ashes get *3* to *4* inches deep in your firebox or ash pan, and when the fire has burned down and cooled, remove excess ashes. Leave an ash bed approximately *1* inch deep on the firebox bottom to help maintain a hot charcoal bed."

"Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, away from all combustible materials, pending final disposal. The ashes should be retained in the closed container until all cinders have thoroughly cooled."

Exhibit 8—Example Text covering Item 2.3.9(e) of this appendix:

"DO NOT OVERFIRE THIS HEATER"

"Attempts to achieve heat output rates that exceed heater design specifications can result in permanent damage to the heater and to the catalytic combustor if so equipped."

2.3.10 Wood Heater Installation, Including Stack Height, Heater Locations and Achieving Proper Draft

Owner's manual must include:

(a) Importance of proper draft;

(b) Conditions indicating inadequate draft;

(c) Conditions indicating excessive draft; and

(d) Guidance on proper stack height and proper heater locations, *i.e.,* not too close to neighbors or in valleys that would cause unhealthy air quality or nuisance conditions.

2.3.10.1 No example text is supplied for (d) because state, local and tribal requirements are model and location specific.

Exhibit 9—Example Text for Item (a):

"Draft is the force which moves air from the appliance up through the chimney. The amount of draft in your chimney depends on the length of the chimney, local geography, nearby obstructions and other factors. Too much draft may cause excessive temperatures in the appliance and may damage the catalytic combustor. Inadequate draft may cause backpuffing into the room and 'plugging' of the chimney or the catalyst."

Exhibit 10—Example Text for Item (b):

"Inadequate draft will cause the appliance to leak smoke into the room through appliance and chimney connector joints."

Exhibit 11—Example Text for Item (c):

"An uncontrollable burn or excessive temperature indicates excessive draft."

2.3.11 Efficiency

Owner's manual must include:

(a) Description of how the efficiency was determined, *e.g.,* use higher heating value of the fuel instead of lower heating value of the fuel, discuss sweet spot versus annual average versus annual fuel usage efficiency (AFUE);

(b) How operation and fuels affect efficiency, *e.g.,* seasoned wood versus high moisture fuel; operation at sweet spot versus low-burn rates; and

(c) How location affects the efficiency, *e.g.,* in main living area versus basement versus outdoors in sub-freezing temperatures.

2.3.12 Smoke and Carbon Monoxide Emissions and Monitors

Owner's manual must include:

(a) Discussion of smoke and carbon monoxide (CO) emissions, including the CO data submitted in the certification application and expected variations for different operating conditions;

(b) Recommendation to have smoke monitors; and

(c) Recommendation to have monitors for areas that are expected to generate CO, *e.g.,* heater fueling areas, pellet fuel bulk storage areas, sheds containing hydronic heaters.

3. Instructions for Preparation of Wood Heater Temporary Labels

3.1 Temporary labels that show the values for emissions, efficiency, recommended heating area and the compliance status may (voluntarily) be affixed by the manufacturer to wood heaters that meet the 2020 particulate matter emission standards early or that meet the cord wood alternative compliance options in subparts AAA and QQQQ of this part.

3.2 The seller of each heater covered by section 3.1 may ensure that the temporary label remains affixed until each heater is purchased by the end user.

3.3 The temporary label option for the 2020 particulate matter emission standards end as of May 15, 2020.

3.4 The template for the temporary labels will be supplied by the Administrator upon request.

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