be addressed to U.S. Department of Education, 400 Maryland Avenue, SW., LBJ, Washington, DC 20202–4537. Requests may also be electronically mailed to *ICDocketMgr@ed.gov* or faxed to 202–401–0920. Please specify the complete title of the information collection when making your request.

Comments regarding burden and/or the collection activity requirements should be electronically mailed to *ICDocketMgr@ed.gov.* Individuals who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 1–800–877–8339.

[FR Doc. E9–28819 Filed 12–1–09; 8:45 am]

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DEPARTMENT OF ENERGY

[Case No. CAC–022]

Energy Conservation Program for Consumer Products: Publication of the Petition for Waiver and Granting the Application for Interim Waiver of Hallowell International From the Department of Energy Residential Central Air Conditioner and Heat Pump Test Procedure

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

ACTION: Notice of Petition for Waiver, Granting an Application for Interim Waiver, and request for public comments.

SUMMARY: This notice announces receipt of and publishes the Hallowell International (Hallowell) Petition for Waiver (hereafter, ''Petition'') from the U.S. Department of Energy (DOE) test procedure for determining the energy consumption of residential central air conditioners and heat pumps for certain specified equipment. The waiver request pertains to Hallowell's Boosted Compression heat pumps, a product line that uses three-stage technology to enable efficient heating at very low outdoor temperatures. The existing test procedure accounts for two-capacity compressors, but not three-capacity operation. Therefore, Hallowell has suggested an alternate test procedure to calculate the heating performance of its three-stage Boosted Compression products. DOE is soliciting comments, data, and information concerning Hallowell's Petition and the suggested alternate test procedure. DOE is also granting an interim waiver to Hallowell.

DATES: DOE will accept comments, data, and information with respect to the Hallowell Petition until, but no later than January 4, 2010.

ADDRESSES: You may submit comments, identified by case number [CAC–022], by any of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the instructions for submitting comments.
- *E-mail: AS_Waiver_Requests@ee.doe.gov.* Include either the case number [CAC–022], and/or ''Hallowell Petition'' in the subject line of the message.
- *Mail:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, Petition for Waiver Case No. RF–008, 1000 Independence Avenue, SW., Washington, DC 20585–0121. *Telephone:* (202) 586–2945. Please submit one signed original paper copy.
- *Hand Delivery/Courier:* Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC 20024. Please submit one signed original paper copy.

Instructions: All submissions received must include the agency name and case number for this proceeding. Submit electronic comments in WordPerfect, Microsoft Word, Portable Document Format (PDF), or text (American Standard Code for Information Interchange (ASCII)) file format, and avoid the use of special characters or any form of encryption. Wherever possible, include the electronic signature of the author. DOE does not accept telefacsimiles (faxes).

Any person submitting written comments must also send a copy of such comments to the petitioner, pursuant to 10 CFR 430.27(d). The contact information for the petitioner is: Mr. Joseph M. Gross, Design Engineer, Hallowell International, 110 Hildreth Street, Bangor, ME 04401. *Telephone:* (207) 990–5600 x121. *E-mail: jgross@gotohallowell.com.*

According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit two copies: one copy of the document including all the information believed to be confidential, and one copy of the document with the information believed to be confidential deleted. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Docket: For access to the docket to review the background documents relevant to this matter, you may visit the U.S. Department of Energy, 950 L'Enfant Plaza, SW., (Resource Room of the Building Technologies Program), Washington, DC 20024; (202) 586–2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Available documents include the following items: (1) This notice; (2) public comments received; (3) the Petition for Waiver and Application for Interim Waiver; and (4) prior DOE rulemakings regarding similar central air conditioning and heat pump equipment. Please call Ms. Brenda Edwards at the above telephone number for additional information regarding visiting the Resource Room.

FOR FURTHER INFORMATION CONTACT: Dr. Michael G. Raymond, U.S. Department of Energy, Building Technologies Program, Mail Stop EE–2J, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121. *Telephone:* (202) 586–9611. *E-mail: Michael.Raymond@ee.doe.gov.*

Francine Pinto or Eric Stas, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC–72, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0103. *Telephone:* (202) 586–9507. *E-mail: Francine.Pinto@hq.doe.gov* or *Eric.Stas@hq.doe.gov.*

SUPPLEMENTARY INFORMATION:

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I. Background and Authority

Title III of the Energy Policy and Conservation Act (EPCA) sets forth a variety of provisions concerning energy efficiency. Part A of Title III establishes the Energy Conservation Program for Consumer Products Other Than Automobiles.[1] (42 U.S.C. 6291–6309) This notice involves residential products under Part A, and EPCA specifically includes definitions, test procedures, labeling provisions, energy conservation standards, and the authority to require information and reports from manufacturers.

With respect to test procedures, Part A generally authorizes the Secretary of Energy (the Secretary) to prescribe test procedures that are reasonably designed to produce results which reflect energy efficiency, energy use, and estimated annual operating costs, and that are not unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

[1] These two parts were originally titled Parts B and C, but were redesignated as Parts A and A–1 in the United States Code for editorial reasons.

Relevant to the current Petition for Waiver, the test procedures for residential central air conditioners and central air conditioning heat pumps are set forth in 10 CFR Part 430, subpart B, appendix M. Section 323 of EPCA provides that the Secretary of Energy may amend test procedures for consumer products if the Secretary determines that amended test procedures would more accurately reflect energy efficiency, energy use or estimated annual operating costs, and are not unduly burdensome to conduct. (42 U.S.C. 6293(b)(1)(A) and (b)(3))

DOE's regulations contain provisions allowing a person to seek a waiver from the test procedure requirements for covered products, for which the petitioner's basic model contains one or more design characteristics that prevent testing according to the prescribed test procedures, or when the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption as to provide materially inaccurate comparative data. 10 CFR 430.27(a)(1). Petitioners must include in their petition any alternate test procedures known to evaluate the basic model in a manner representative of its energy consumption. 10 CFR 430.27(b)(1)(iii). The Assistant Secretary for Energy Efficiency and Renewable Energy (the Assistant Secretary) may grant the waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(l). Within 1 year of granting the waiver, DOE must publish in the **Federal Register** a notice of proposed rulemaking to amend its regulations so as to eliminate any need for the continuation of such waiver. As soon thereafter as practicable, the Department of Energy must publish in the **Federal Register** a final rule. The waiver will terminate on the effective date of such final rule. 10 CFR 430.27(m).

The waiver process also permits parties petitioning DOE for a waiver to apply for an Interim Waiver from the prescribed test procedure requirements. 10 CFR 430.27(a)(2). The Assistant Secretary will grant an Interim Waiver request if it is determined that the applicant will experience economic hardship if the Interim Waiver is denied, if it appears likely that the Petition for Waiver will be granted, and/or the Assistant Secretary determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the Petition for Waiver. 10 CFR 430.27(g). An Interim Waiver remains in effect for a period of 180 days or until DOE issues its determination on the Petition for Waiver, whichever is sooner, and may be extended for an additional 180 days, if necessary. 10 CFR 430.27(h).

II. Petition for Waiver

On July 29, 2008, Hallowell filed a Petition for Waiver from the test procedures applicable to residential air conditioning and heating equipment and an Application for Interim Waiver. The applicable test procedure for Hallowell's residential Boosted Compression products is the DOE residential test procedure found in 10 CFR Part 430, Subpart B, Appendix M. Hallowell included an alternate test procedure in its July 29, 2008, submittal, but the alternate procedure was incomplete. On April 25, 2009, Hallowell submitted the revised petition and alternate test procedure included in this **Federal Register** notice.

Hallowell seeks a waiver from the DOE test procedures on the grounds that its Boosted Compression heat pump systems contain design characteristics that prevent testing according to the current DOE test procedure. The DOE test procedure covers systems with a single speed, with two steps or stages of modulation, and with continuous modulation over a finite range through the incorporation of a variable-speed or digital compressor. Hallowell's product deviates from the anticipated form—a system whose performance falls between that of a two-capacity system and a conventional variable-capacity system—because the three-capacity capability is limited to heating mode operation. Moreover, the additional stage of heating capacity is specifically used at the lowest outdoor temperatures with the aim of maximizing the total heating contributed by the heat pump relative to the total heating supplied by the auxiliary heat source (usually electric resistance). Another unique feature of Hallowell's low-temperature heat pump system is that for any given outdoor temperature, only two-stages of heating are permitted; one stage is always locked out.

Rating Hallowell's Boosted Compression products will require modified calculation algorithms and testing at an additional, lower temperature to capture the effect on both capacity and power of the additional stage/level of heating operation. The building load assigned within

HSPF calculations requires evaluation based on the case where high-stage compressor capacity for heating exceeds the high-stage compressor capacity for cooling. Finally, the control feature that limits the number of heating mode capacity levels to two for any given outdoor temperature must be accounted for.

Accordingly, Hallowell requests that DOE grant a test procedure waiver for its Boosted Compression product designs, until a suitable test method can be prescribed. Furthermore, Hallowell states that failure to grant the waiver would result in economic hardship because it would prevent the company from marketing its Boosted Compression products.

III. Application for Interim Waiver

In addition to its Petition for Waiver, submitted on July 29, 2008 and revised on April 25, 2009, Hallowell submitted to DOE an Application for Interim Waiver. On May 29, 2009, Hallowell submitted a revised Petition for Waiver and Application for Interim Waiver containing information concerning the financial hardship and competitive disadvantage Hallowell is facing. Hallowell states that it is difficult to build sales volume and gain credibility when there are no standards to provide performance ratings for the equipment, which would entitle its customers to rebates, tax credits, and other incentives. Since the release of the Recovery Act with new criteria for energy efficiency tax rebates, business growth at Hallowell has diminished. Many of Hallowell's dealers and distributors have submitted letters concerning the lack of sales of the Acadia system due lack of AHRI listing, and therefore no rebates available. Hallowell submitted an attachment of many dealer/distributor letters claiming these hardships. With sales down, Hallowell International has cut back on all research and development, development of new products and new manufacturing production that would enable the company to grow.

In those instances where it appears likely the Petition for Waiver will be granted, based upon a product design that has characteristics which prevent testing according to the prescribed test procedure, it is in the public interest to allow products to be marketed that DOE believes are exceptionally energy-efficient. Hallowell's three-speed Boosted Compression heat pumps are capable of efficient operation at much lower temperatures than two-speed heat pumps (Hallowell measured a coefficient of performance of 2.1 at −15 °F), making them potentially very desirable for heating in cold climates. The alternate test procedure submitted by Hallowell is not radically different from the current DOE test procedure, which has provisions for heat pumps having a two-capacity compressor. The Hallowell alternate test procedure is a logical extension of DOE's two-capacity test method to cover Hallowell's three-capacity compressor. The two (of three potential) active stages of heating capacity available for each bin temperature calculation will be based on Hallowell's control logic. The HSPF algorithm will follow the algorithm in the DOE test procedure used for two-capacity heat pumps. Thus, DOE has determined that it is likely that Hallowell's Petition for Waiver will be granted for its new Boosted Compression three-speed models.

Therefore, DOE grants Hallowell's application for Interim Waiver from testing of its Boosted Compression heat pump models. This granting of Interim Waiver may be modified at any time upon a determination that the factual basis underlying the application is incorrect.

IV. Alternate Test Procedure

DOE plans to consider inclusion of the following waiver language in the Decision and Order for Hallowell's Boosted Compression central air conditioning heat pumps models:

(1) The ''Petition for Waiver'' filed by Hallowell is hereby granted as set forth in the paragraphs below.

(2) Hallowell shall not be required to test or rate its Boosted Compression central air conditioning heat pumps products listed above in section III, on the basis of the currently applicable DOE test procedure, but shall be required to test and rate such products according to the alternate test procedure as set forth in paragraph (3).

(3) Add section 3.6.6 to address the heating mode tests conducted on units having a triple-capacity compressor.

3.6.6 Tests for a heat pump having a triple-capacity compressor. Test triple-capacity, northern heat pumps for the heating mode as follows:

a. Conduct one Maximum Temperature Test ($H0_1$), two High Temperature Tests ($H1_2$ and $H1_1$), two Frost Accumulation Tests ($H2_2$ and $H2_1$), three Low Temperature Tests ($H3_1$, $H3_2$, and $H3_3$), and one Minimum Temperature Test ($H4_3$). An alternative to conducting the $H2_1$ Frost Accumulation Test to determine $\dot{Q}_h^{k=1}(35)$ and $\dot{E}_h^{k=1}(35)$ is to use the following equations to approximate this capacity and electrical power:

$$\dot{Q}_h^{k=1}(35) = 0.90 \cdot \left\{\dot{Q}_h^{k=1}(17) + 0.6 \cdot \left[\dot{Q}_h^{k=1}(47) - \dot{Q}_h^{k=1}(17)\right]\right\}$$

$$\dot{E}_h^{k=1}(35) = 0.985 \cdot \left\{\dot{E}_h^{k=1}(17) + 0.6 \cdot \left[\dot{E}_h^{k=1}(47) - \dot{E}_h^{k=1}(17)\right]\right\}$$

In evaluating the above equations, determine the quantities $\dot{Q}_h^{k=1}(47)$ and $\dot{E}_h^{k=1}(47)$ from the $H1_1$ Test and evaluate them according to Section 3.7. Determine the quantities $\dot{Q}_h^{k=1}(17)$ and $\dot{E}_h^{k=1}(17)$ from the $H3_1$ Test and evaluate them according to Section 3.10. If the manufacturer conducts the $H2_1$ Test, the option of using the above default equations is not forfeited. Use the paired values of $\dot{Q}_h^{k=1}(35)$ and $\dot{E}_h^{k=1}(35)$ derived from conducting the $H2_1$ Frost Accumulation Test and evaluated as specified in section 3.9.1 or use the paired values calculated using the above default equations, whichever paired values contribute to a higher Region IV HSPF based on the $DHR_{min.}$

Conducting a Frost Accumulation Test ($H2_3$) with the heat pump operating at its booster capacity is optional. If this optional test is not conducted, determine $\dot{Q}_h^{k=3}(35)$ and $\dot{E}_h^{k=3}(35)$ using the following equations to approximate this capacity and electrical power:

$$\dot{Q}_h^{k=3}(35) = QR_h^{k=2}(35) \cdot \left\{\dot{Q}_h^{k=3}(17) + 1.20 \cdot \left[\dot{Q}_h^{k=3}(17) - \dot{Q}_h^{k=3}(2)\right]\right\}$$

$$\dot{E}_h^{k=3}(35) = PR_h^{k=2}(35) \cdot \left\{\dot{E}_h^{k=3}(17) + 1.20 \cdot \left[\dot{E}_h^{k=3}(17) - \dot{E}_h^{k=3}(2)\right]\right\}$$

Where,

$$QR_h^{k=2}(35) = \frac{\dot{Q}_h^{k=2}(35)}{\dot{Q}_h^{k=2}(17) + 0.6 \cdot \left[\dot{Q}_h^{k=2}(47) - \dot{Q}_h^{k=2}(17)\right]}$$

$$PR_h^{k=2}(35) = \frac{\dot{E}_h^{k=2}(35)}{\dot{E}_h^{k=2}(17) + 0.6 \cdot \left[\dot{E}_h^{k=2}(47) - \dot{E}_h^{k=2}(17)\right]}$$

Determine the quantities $\dot{Q}_h^{k=2}(47)$ and $\dot{E}_h^{k=2}(47)$ from the $H1_2$ Test and evaluate them according to Section 3.7. Determine the quantities $\dot{Q}_h^{k=2}(35)$ and $\dot{E}_h^{k=2}(35)$ from the $H2_2$ Test and evaluate them according to Section 3.9.1. Determine the quantities $\dot{Q}_h^{k=2}(17)$ and $\dot{E}_h^{k=2}(17)$ from the $H3_2$ Test, determine the quantities $\dot{Q}_h^{k=3}(17)$ and $\dot{E}_h^{k=3}(17)$ from the $H3_3$ Test, and determine the quantities $\dot{Q}_h^{k=3}(2)$ and $\dot{E}_h^{k=3}(2)$ from the $H4_3$ Test. Evaluate all six quantities according to Section 3.10. If the manufacturer conducts the $H2_3$ Test, the option of using the above default equations is not forfeited. Use the paired values of $\dot{Q}_h^{k=3}(35)$ and $\dot{E}_h^{k=3}(35)$ derived from conducting the $H2_3$ Frost Accumulation Test and calculated as specified in section 3.9.1 or use the paired values calculated using the above default equations, whichever paired values contribute to a higher Region IV HSPF based on the $DHR_{min.}$

Table A specifies test conditions for all thirteen tests.

TABLE A—HEATING MODE TEST CONDITIONS FOR UNITS HAVING A TRIPLE-CAPACITY COMPRESSOR

Test description	Air entering indoor unit temperature (°F)		Air entering outdoor unit temperature (°F)		Compressor capacity	Booster	Heating air volume rate
	Dry bulb	Wet bulb (max)	Dry bulb	Wet bulb			
$H0_1$ Test (required, steady).	70	60	62	56.5	Low	Off	Heating Minimum [1]
$H1_2$ Test (required, steady).	70	60	47	43	High	Off	Heating Full-Load [2]
$H1C_2$ Test (optional, cyclic).	70	60	47	43	High	Off	([3])
$H1_1$ Test (required)	70	60	47	43	Low	Off	Heating Minimum([1])
$H1C_1$ Test (optional, cyclic).	70	60	47	43	Low	Off	([4])
$H2_3$ Test (optional, steady).	70	60	35	33	High	On	Heating Full-Load [2]
$H2_2$ Test (required)	70	60	35	33	High	Off	Heating Full-Load [2]
$H2_1$ Test [(5 6)] (required).	70	60	35	33	Low	Off	Heating Minimum [1]
$H3_2$ Test (required, steady).	70	60	17	15	High	On	Heating Full-Load [2]
$H3C_3$ Test (optional, cyclic).	70	60	17	15	High	On	([7])
$H3_2$ Test (required, steady).	70	60	17	15	High	Off	Heating Full-Load [2]
$H3_1$ Test [5] (required, steady).	70	60	17	15	Low	Off	Heating Minimum [1]
$H4_3$ Test (required, steady).	70	60	0	−2	High	On	Heating Full-Load [2]

[1] Defined in section 3.1.4.5.
[2] Defined in section 3.1.4.4.
[3] Maintain the airflow nozzle(s) static pressure difference or velocity pressure during the ON period at the same pressure or velocity as measured during the $H1_2$ Test.
[4] Maintain the airflow nozzle(s) static pressure difference or velocity pressure during the ON period at the same pressure or velocity as measured during the $H1_1$ Test.
[5] Required only if the heat pump's performance when operating at low compressor capacity and outdoor temperatures less than 37 °F is needed to complete the section 4.2.6 HSPF calculations.
[6] If table note #5 applies, the section 3.6.3 equations for $\dot{Q}_h^{k=1}(35)$ and $\dot{E}_h^{k=1}(17)$ may be used in lieu of conducting the $H2_1$ Test.
[7] Maintain the airflow nozzle(s) static pressure difference or velocity pressure during the ON period at the same pressure or velocity measured during the $H3_3$ Test.

Section 4.2.3 of Appendix M shall be revised to read as follows:

4.2.3. Additional steps for calculating the HSPF of a heat pump having a triple-capacity compressor. * * *

a. Evaluate the space heating capacity and electrical power consumption of the heat pump at outdoor temperature T_j and with a first stage call from the thermostat (k=1), and with a second stage call from the thermostat (k=2) using:

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$$\dot{Q}_h^{k=1}(T_j) = \begin{cases} \dot{Q}_h^{k=1}(47) + \dfrac{[\dot{Q}_h^{k=1}(62) - \dot{Q}_h^{k=1}(47)] \cdot (T_j - 47)}{62 - 47}, & \text{if } T_j > 41°F \\ \dot{Q}_h^{k=1}(17) + \dfrac{[\dot{Q}_h^{k=1}(35) - \dot{Q}_h^{k=1}(17)] \cdot (T_j - 17)}{35 - 17}, & \text{if } 15°F < T_j \le 41°F \\ \dot{Q}_h^{k=2}(0) + \dfrac{[\dot{Q}_h^{k=2}(17) - \dot{Q}_h^{k=2}(0)] \cdot (T_j - 0)}{17 - 0}, & \text{if } -30°F < T_j \le 15°F \end{cases}$$

$$\dot{Q}_h^{k=2}(T_j) = \begin{cases} \dot{Q}_h^{k=1}(47) + \dfrac{[\dot{Q}_h^{k=1}(62) - \dot{Q}_h^{k=1}(47)] \cdot (T_j - 47)}{62 - 47}, & \text{if } T_j > 62°F \\ \dot{Q}_h^{k=1}(17) + \dfrac{[\dot{Q}_h^{k=1}(35) - \dot{Q}_h^{k=1}(17)] \cdot (T_j - 17)}{35 - 17}, & \text{if } 25°F < T_j \le 62°F \\ \dot{Q}_h^{k=2}(0) + \dfrac{[\dot{Q}_h^{k=2}(17) - \dot{Q}_h^{k=2}(0)] \cdot (T_j - 0)}{17 - 0}, & \text{if } -30°F < T_j \le 25°F \end{cases}$$

$$\dot{E}_h^{k=1}(T_j) = \begin{cases} \dot{E}_h^{k=1}(47) + \dfrac{[\dot{E}_h^{k=1}(62) - \dot{E}_h^{k=1}(47)] \cdot (T_j - 47)}{62 - 47}, & \text{if } T_j > 41°F \\ \dot{E}_h^{k=1}(17) + \dfrac{[\dot{E}_h^{k=1}(35) - \dot{E}_h^{k=1}(17)] \cdot (T_j - 17)}{35 - 17}, & \text{if } 15°F < T_j \le 41°F \\ \dot{E}_h^{k=2}(0) + \dfrac{[\dot{E}_h^{k=2}(17) - \dot{E}_h^{k=2}(0)] \cdot (T_j - 0)}{17 - 0}, & \text{if } -30°F < T_j \le 15°F \end{cases}$$

$$\dot{E}_h^{k=2}(T_j) = \begin{cases} \dot{E}_h^{k=1}(47) + \dfrac{[\dot{E}_h^{k=1}(62) - \dot{E}_h^{k=1}(47)] \cdot (T_j - 47)}{62 - 47}, & \text{if } T_j > 62°F \\ \dot{E}_h^{k=1}(17) + \dfrac{[\dot{E}_h^{k=1}(35) - \dot{E}_h^{k=1}(17)] \cdot (T_j - 17)}{35 - 17}, & \text{if } 25°F < T_j \le 62°F \\ \dot{E}_h^{k=2}(0) + \dfrac{[\dot{E}_h^{k=2}(17) - \dot{E}_h^{k=2}(0)] \cdot (T_j - 0)}{17 - 0}, & \text{if } -30°F < T_j \le 25°F \end{cases}$$

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V. Summary and Request for Comments

Through today's notice, DOE grants Hallowell's Petition for Interim Waiver and announces receipt of Hallowell's Petition for Waiver from the test procedures applicable to Hallowell's Boosted Compression there-speed heat pump products. As part of this notice, DOE is publishing Hallowell's Petition for Waiver in its entirety. The Petition includes a suggested alternate test procedure and calculation methodology to determine the energy consumption of Hallowell's specified heat pumps with Boosted Compression technology. The Petition contains no confidential information.

DOE is interested in receiving comments on the issues addressed in this notice. Pursuant to 10 CFR 430.27(d), any person submitting written comments must also send a copy of such comments to the petitioner, whose contact information is included in the **ADDRESSES** section above.

Issued in Washington, DC, on November 23, 2009.

Cathy Zoi,

Assistant Secretary, Energy Efficiency and Renewable Energy.

To: Michael Raymond, Department of Energy

From: Joseph M Gross, Hallowell International

Subject: Petition to waive CFR (Code of Federal Regulations) Part 430 performance ratings for ACADIA Combined Heating and Cooling System.

Date: April 25, 2009

CC: American Heating and Refrigeration Institute Assistant Secretary for Energy Efficiency and Renewable Energy

To whom it may concern,

Hallowell International manufactures and markets air source heat pump equipment featuring a patented technology known as Boosted Compression. This technology greatly enhances the cold temperature performance of an air source heat pump, enabling the equipment to remain effective in heating operation at temperatures as cold as –30°F without the need for any form of supplemental heat.

The physical nature of this technology, as well as the control by which it is operated, eliminates the possibility of testing under the existing 210/240–2008 standard for unitary air source heat pump equipment, following Appendix M to Subpart B of CFR Part 430, as has been confirmed by engineering at ETL Semko, and engineering at AHRI. The current standard covers 1 and 2 speed systems. Boosted Compression effectively introduces 3 speed technologies to the marketplace, yet operates similar to a 1 or 2 stage system at any given temperature condition.

This letter will discuss the mechanical and functional details of the equipment, define how the normal operation makes testing under current standards irrelevant, and describe what operating specifics should be validated to show the true operating benefits of the equipment. A suggestion for modifications to existing standards is also included, as well as an interim request for a temporary test waiver.

Because of the large amount of effort and financial resources that have been expended on testing under current standards, Hallowell International requests to be considered in two stages. The first and most immediate stage is for consideration is to be given for a waiver, declaring the equipment outside of any test standard and relieving the equipment temporarily from the requirement. The second stage is to consider Hallowell International's suggestions for small modifications to the existing CFR Part 430 standard, or for a waiver offering an alternate test method to AHRI. The recommended test method will define the addition of 3 speed systems to the standard, and suggest how these systems may be modeled similarly to 1 and 2 speed systems.

Affected Models

The Hallowell International model group has seven specific models that are currently, or were previously, available on the market:

1. ACADIA024
2. ACADIA036
3. ACADIA048
4. 36C35H
5. 42C46H
6. ACHP03642
7. ACHP02431

The model group is covered under the following trade names:

1. All Climate Heat Pump
2. ACHP
3. Acadia Combined Heating and Cooling System
4. Acadia System
5. Acadia Heat Pump
6. Acadia
7. Hallowell ACADIA
8. Hallowell All Climate Heat Pump
9. Hallowell ACHP
10. Hallowell Acadia Combined Heating and Cooling System
11. Hallowell Heat Pump
12. Boosted Compression Heat Pump
13. Opti-Cycle Heat Pump

Mechanical and Functional Details of Boosted Compression

The model group to be considered for a Department of Energy waiver falls under the system classification HRCU–A–CB, where a heat pump system is comprised of two primary components; the outdoor condensing unit with an outdoor coil and compressors which is mated to an indoor coil with a fan. The model was designed as a ''Two Speed'' system whereby the definitions of ''Two Speed'' systems from section 3.16 of the 210/240–2008 Standard were considered within the scope of the design.

Boosted Compression equipment is comprised of two compressors paired in series. The first compressor, the Primary compressor, is able to modulate between half capacity and full capacity by reversing rotation of the crank shaft and mechanically eliminating the motion of one of the two internal pistons for half capacity operation. The Primary compressor functions for heating operation and for cooling operation. A second compressor, the Booster compressor, is a fixed speed, fixed capacity compressor that is used at cold ambient outdoor conditions to increase the mass flow rate of refrigerant through the system and increase the low temperature performance by a process of supercharging the refrigeration cycle. This compressor is used exclusively in heating operation at and below 25 °F, and does not operate during, or affect air conditioning operation or performance.

The following covers the definition from the 210/240–2008 Standard (CFR Part 430, Appendix M, section 1.43), at a very basic level, how this system was thought to be acceptable for ''Two Speed'' testing.

3.16 Two-capacity (or Two-stage) Compressor. An air conditioner or heat pump that has one of the following:

c. Two compressors where one compressor (Compressor #1) operates at low loads and both compressors (Compressors #1 and #2) operate at high loads but Compressor #2 never operates alone

For such systems, low capacity means:

c. Operating Compressor #1, or

d. Operating with the compressor unloading (e.g., operating one piston of a two-piston reciprocating compressor, using a fixed fractional volume of the full scroll, etc.).

For such systems, high capacity means:

c. Operating Compressors #1 and #2.

A Boosted Compression system stages between a high and a low capacity throughout the systems' operating envelope much like traditional 2 speed systems. The system brings on higher capacities to satisfy larger loads, typically as a function of a call for higher capacity from a thermostat. In this system there are 4 heating capacities and 2 cooling capacities. At any given temperature point of operation, there are only 2 capacities available from the system, which stage based on outdoor air temperature and the heating or cooling call from the thermostat. The table below illustrates the algorithm of staging as utilized in the control for Boosted Compression equipment.

Heating call at thermostat	BIN A ODT – 30	BIN B – 30 ≤ ODT < 15	BIN C 15 ≤ ODT < 25	BIN D 25 ≤ ODT < 34	BIN E 34 ≤ ODT < 41	BIN F 41 ≤ ODT < 62	BIN G 62 ≤ ODT
Y1	W1	M3	M2	M2	M2	M1	M1
Y2	W1	M4	M3	M2+W1	M2	M2	M1

Where:

W1: Auxiliary heat control output

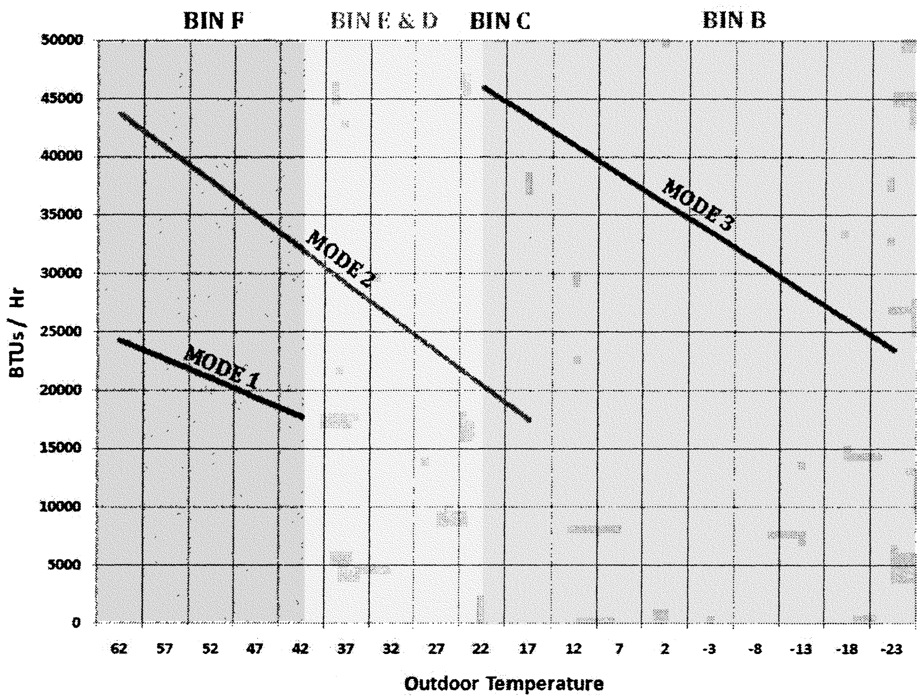
M1: Single cylinder operation, half capacity of Primary Compressor, heating and cooling

M2: Two cylinder operation, Full capacity of Primary Compressor, heating and cooling

M3: M2 + Booster Compressor + Economizer operation, heating only

M4: M3 + W1

As the table above illustrates, at any given outdoor temperature condition, a Boosted Compression system operates with a maximum of two capacities, using 2 of the 3 modes of heating (4 modes including 1st stage resistance) depending on what the ambient temperature is at the current time of operation. The graph below shows more accurately how a Boosted Compression system can be used as a two stage system, but how the outdoor temperature conditions affect which of the two out of four modes of operation will make up the two capacities for said condition. The graph only shows Modes 1–3, showing vapor cycle operation only.



The graph shows how at any given temperature BIN, the Acadia only utilizes a maximum of 2 out of its 3 stages of vapor cycle. In fact, in BINs G (not shown), E, D, and B, the Acadia acts like a single stage system, utilizing only one mode in these BINs.

A typical two speed heat pump would, if using the Boosted Compression terminology to define operation, only have M1, M2, and M2 + W1 available for system operation. Boosted Compression adds a 3rd stage of compression to the vapor cycle with the Booster Compressor and an Economizer. This third stage effectively doubles the capacity of the heat pump without a degradation of the Coefficient of Performance at lower ambient conditions. The System is further able to add supplemental or auxiliary heat much like conventional 1 and 2 speed systems for occasions where the vapor cycle alone is unable to maintain the conditioned space.

The following charts illustrate and provide distinction for the differences in Boosted Compression 3 speed systems and standard two speed systems. The charts reflect vapor cycle performance only. From these it is clear that Boosted Compression is effectively a 3 speed, or 3 capacity system, and as such will be the foundation for our recommendation to create a standard for 3 speed equipment as a modification to the existing 210/240–2008 Standard.

Important characteristics to note when comparing the two systems:

1. Capacities at low ambient outdoor conditions
2. Capacity as a function of outdoor temperature
3. Coefficient of performance at low ambient conditions
4. Coefficient of performance relative to system capacity
5. Linear performance of standard systems relative to outdoor temperature
6. Staged performance of 3 speed technology relative to outdoor temperature
7. Charts reflect Maximum Vapor Cycle Capacity and do not include lower speeds at similar outdoor temperatures

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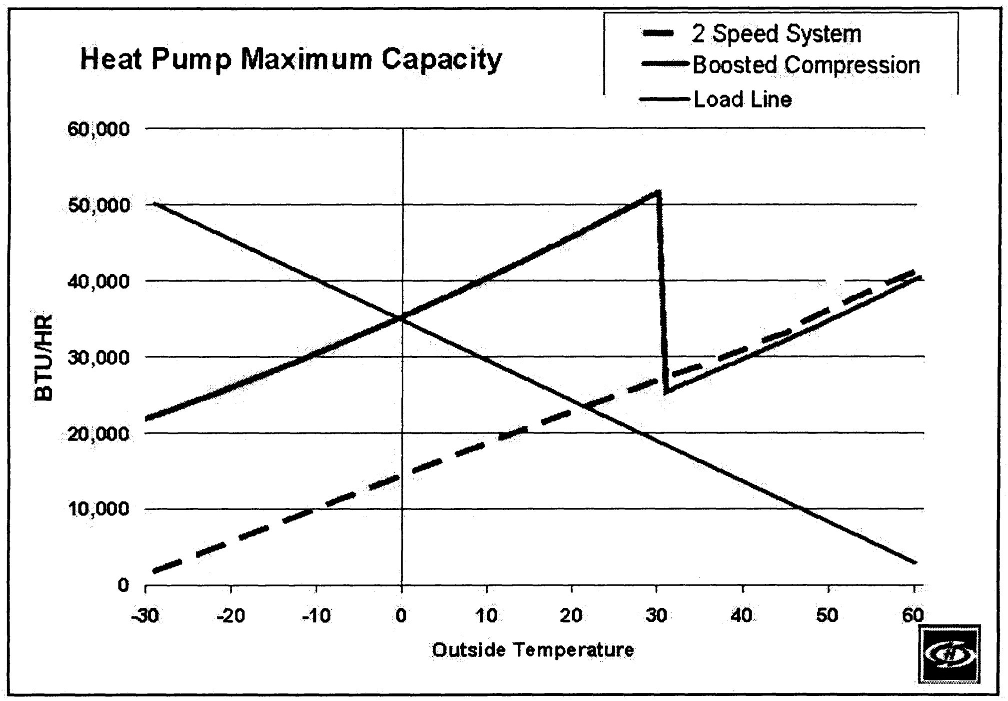
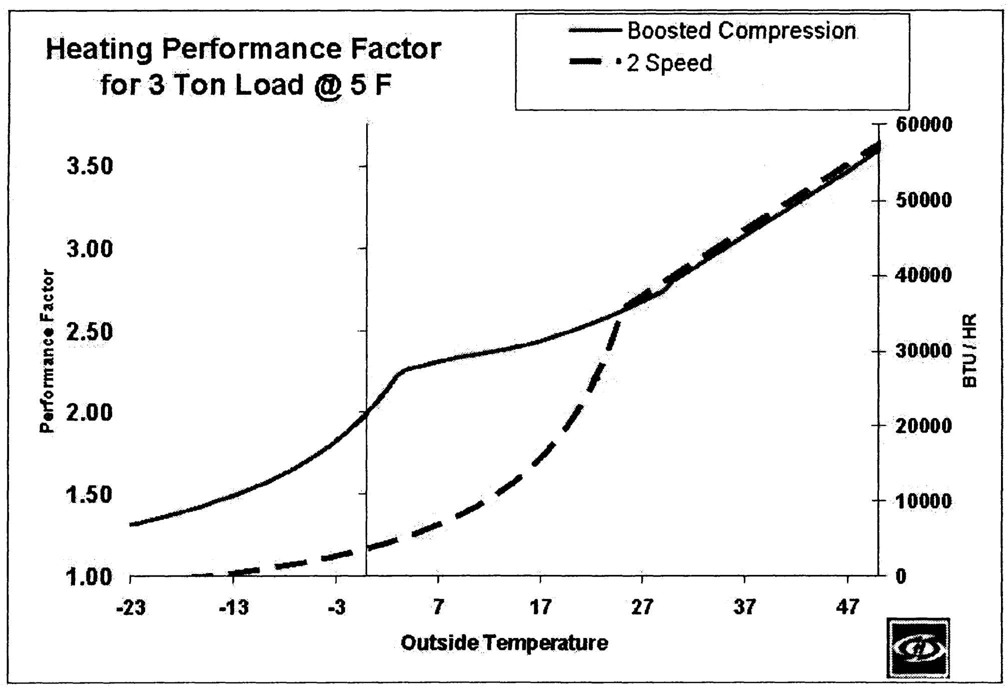
Comparison of Standard 2 Speed and 3 Speed Heat Pumps:





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Restrictions of Current 210/240–2008 Standard

The current 210/240 standard provides an excellent template for the evolution of a 3 speed standard. The restrictions of 2 speed testing for the 3 speed unit are comprised of the following:

1. The expectation that the equipment will follow a linear performance trend and as such can be modeled linearly

2. Operating condition tests are restricted to 62 °F, 47 °F, 35 °F, and 17 °F. This will not collect enough operating characteristics to create an accurate trend, and does not consider advantages of 3 speed equipment at cold temperatures.

3. If the 3 speed system provides 3 speeds of heating, or cooling, how will equipment with different numbers of speeds for both, such as 3 for heating and 2 for cooling be considered?

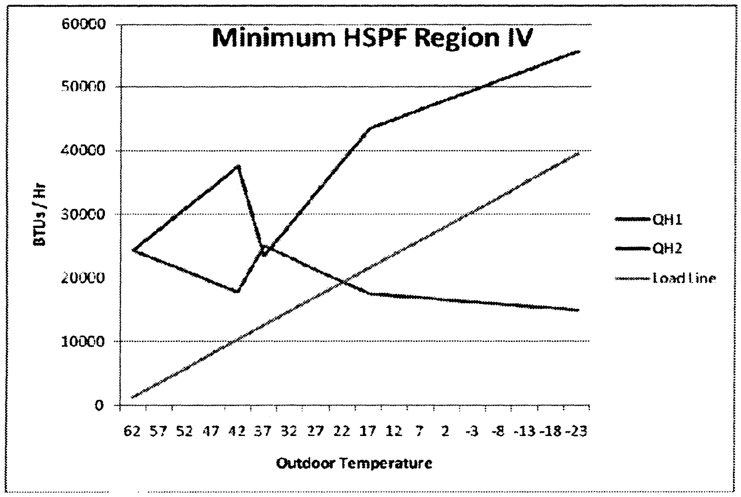
4. Heating Seasonal Performance Factor is calculated from a linear interpolation of system performance along with other factors considering defrosts and cycling penalties. A linear trend cannot be created based on Boosted Compression performance characteristics and erroneous HSPF numbers result. This is easily identified as interpolated capacities trend towards infinite values as outdoor temperature bins get colder, and moderate temperature operation is very low where the two trends meet at an

apex. Note the quotation from AHRI representatives below:

Quote from an e-mail dated 7/18/08 from Ms. Sarah Medepalli, the Certification Engineer assigned to Hallowell International at AHRI.

''The main problem is that 210/240 linearly interpolates to capture the effect of varying outdoor temperature. As such, the lab testing is set up so that the unit's configuration is exactly the same for multiple outdoor conditions. The Hallowell unit, for example, appears to use a different system configuration for the high compressor capacity tests at 47 °F and 17 °F (and maybe 35 °F too). The Hallowell unit would require extra test points and the algorithm used to calculate HSPF would have to be modified to create a more accurate performance map as opposed to the approach of just blindly applying the current 210/240 algorithm for two-capacity heat pumps.''

The following graph illustrates how a Boosted Compression system cannot be modeled correctly using the 210/240 (CFR Part 430, Appendix M) 2 speed standard for calculating Qh^{k-1}, Qh^{k-2}, Eh^{k-1} and Eh^{k-2}, covered in section 4.2.3.a (Qh^{k-1}, Qh^{k-2} and the BL(Tj) are graphed on the chart below).



The graph shows a Boosted Compression system's Qh^{k-1}, Qh^{k-2} and the load line for Minimum HSPF in region IV, where QH1 = Qh^{k-1} and QH2 = Qh^{k-2}. As can be seen in this Illustration, when a Boosted Compression system's heating capacities are interpolated with the 210/240 (CFR Part 430, Appendix M) algorithm, the stages do not represent how any heat pump system can physically operate, showing Qh^{k-2} increasing infinitely as the outdoor temperature conditions drop. The data taken to create this graph was taken directly from ETL's HSPF calculation tables for our 3 Ton system, ARI document # USHP–08315–Q–1.

The 210/240–2008 Standard currently accurately covers the 2 speed air conditioning performance of Boosted Compression, since the Booster Compressor is not allowed to operate in cooling mode, effectively making the system a standard two speed air conditioner.

Recommendations for Modification of Current CFR Part 430 Standard, or Interim Alternate Testing Method for Immediate Consideration

The following recommendations for testing of a ''3 Speed Heat Pump'' are hereby submitted:

1. Additional test points of heating performance, in addition to 62 °F, 47 °F, 35 °F and 17 °F, should be added to account for increased cold temperature performance. The following table illustrates current tests and new tests required to interpolate a 3 stage heat pump under AHRI 210/240 2 speed system standard, where the $H6_2$ test would be a new test condition requirement.

Heating test	IDU entering air °Fdb	IDU entering air °Fwb	ODU entering air °Fdb	ODU entering air °Fwb	System speed
$H0_1$	70	60	62	56.5	Low
$H1_1$	70	60	47	43	Low
$H2_1$	70	60	35	33	Low
$H3_1$	70	60	17	15	Low
$H3_2$	70	60	17	15	High
$H6_2$	70	60	0	−2	High

2. From the CFR Part 430 standard the following equation is defined for HSPF,

$$HSPF = \frac{\sum_{j}^{J} n_j \cdot BL(T_j)}{\sum_{j}^{J} e_h(T_j) + \sum_{j}^{J} RH(T_j)} \cdot F_{def} = \frac{\sum_{j}^{J}\left[\frac{n_j}{N} \cdot BL(T_j)\right]}{\sum_{j}^{J} \frac{e_h(T_j)}{N} + \sum_{j}^{J} \frac{RH(T_j)}{N}} \cdot F_{def} \qquad (4.2\text{-}1)$$

where the design heating requirement, DHR, as defined in section 4.2, is calculated from the 47° test point. This equation will continue to hold true for 3 speed HSPF calculation.

The following equations are compatible with Boosted Compression and continue with a similar methodology to the current standards.

In section 4.2.3, the evaluation of heating capacity (Qh^k) and electrical energy consumption (Eh^k) could be defined by the following performance slope equations:

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$$Qh^{k-1}(Tj) = \begin{cases} Qh^{k-1}(47) + \dfrac{[Qh^{k-1}(62) - Qh^{k-1}(47)]*(Tj - 47)}{(62-47)} & \text{if } Tj > 41^{\circ}F \\ Qh^{k-1}(17) + \dfrac{[Qh^{k-1}(35) - Qh^{k-1}(17)]*(Tj - 17)}{(35-17)} & \text{if } 15^{\circ}F < Tj <= 41^{\circ}F \\ Qh^{k-2}(0) + \dfrac{[Qh^{k-2}(17) - Qh^{k-2}(0)]*(Tj - 0)}{(17-0)} & \text{if } -30^{\circ}F < Tj <= 15^{\circ}F \end{cases}$$

$$Qh^{k-2}(Tj) = \begin{cases} Qh^{k-1}(47) + \dfrac{[Qh^{k-1}(62) - Qh^{k-1}(47)]*(Tj - 47)}{(62-47)} & \text{if } Tj > 62^{\circ}F \\ Qh^{k-1}(17) + \dfrac{[Qh^{k-1}(35) - Qh^{k-1}(17)]*(Tj - 17)}{(35-17)} & \text{if } 25^{\circ}F < Tj <= 62^{\circ}F \\ Qh^{k-2}(0) + \dfrac{[Qh^{k-2}(17) - Qh^{k-2}(0)]*(Tj - 0)}{(17-0)} & \text{if } -30^{\circ}F < Tj <= 25^{\circ}F \end{cases}$$

$$Eh^{k-1}(Tj) = \begin{cases} Eh^{k-1}(47) + \dfrac{[Eh^{k-1}(62) - Eh^{k-1}(47)]*(Tj - 47)}{(62-47)} & \text{if } Tj > 41^{\circ}F \\ Eh^{k-1}(17) + \dfrac{[Eh^{k-1}(35) - Eh^{k-1}(17)]*(Tj - 17)}{(35-17)} & \text{if } 15^{\circ}F < Tj <= 41^{\circ}F \\ Eh^{k-2}(0) + \dfrac{[Eh^{k-2}(17) - Eh^{k-2}(0)]*(Tj - 0)}{(17-0)} & \text{if } -30^{\circ}F < Tj <= 15^{\circ}F \end{cases}$$

$$Eh^{k-1}(Tj) = \begin{cases} Eh^{k-1}(47) + \dfrac{[Eh^{k-1}(62) - Eh^{k-1}(47)]*(Tj - 47)}{(62-47)} & \text{if } Tj > 62^{\circ}F \\ Eh^{k-1}(17) + \dfrac{[Eh^{k-1}(35) - Eh^{k-1}(17)]*(Tj - 17)}{(35-17)} & \text{if } 25^{\circ}F < Tj <= 62^{\circ}F \\ Eh^{k-2}(0) + \dfrac{[Eh^{k-2}(17) - Eh^{k-2}(0)]*(Tj - 0)}{(17-0)} & \text{if } -30^{\circ}F < Tj <= 25^{\circ}F \end{cases}$$

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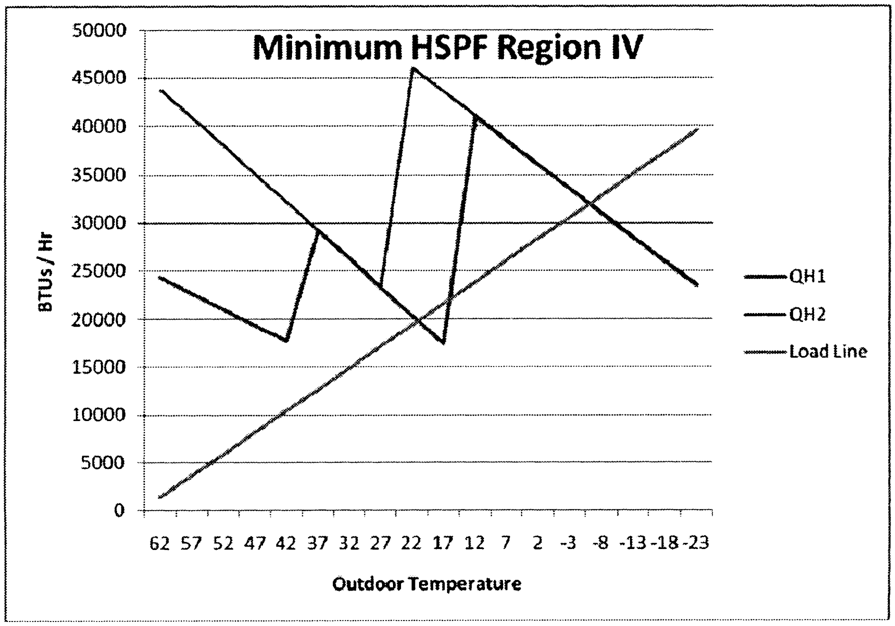
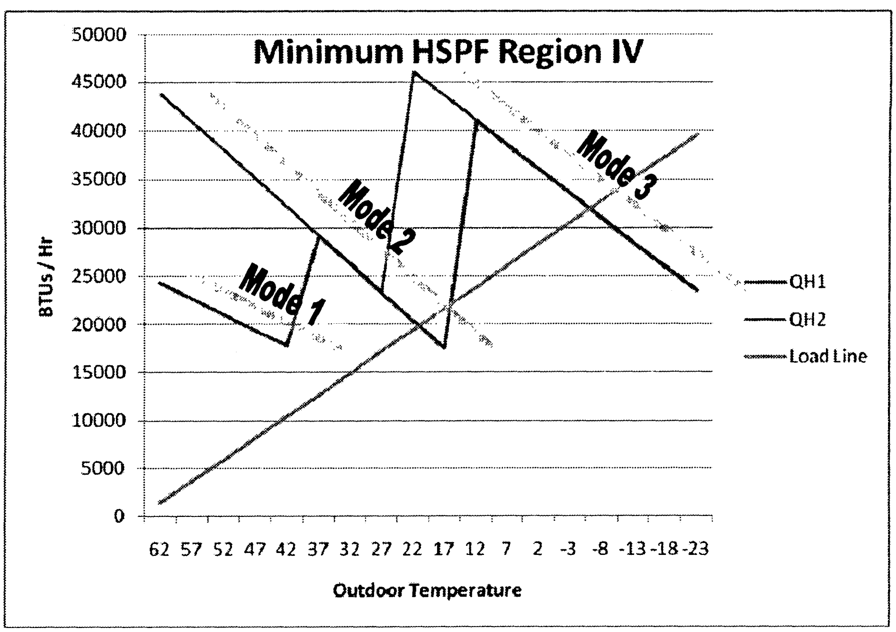
With these algorithms used to interpolate capacity (Qh^k) and electrical energy consumption (Eh^k), the following graph can be achieved from entering data into the CFR Part 430 standard for calculating HSPF on a 2 speed heat pump system, and plotting $Qh^{k=1}$, $Qh^{k=2}$ and the BL(Tj) vs. the temperature BIN temperature (Tj), where QH1 = Qh^{k-1} and QH2 = Qh^{k-2}.



It can easily be seen, when comparing this graph to the one outlining the modes of operation in different temperature BINs that these new algorithms accurately portray a Boosted Compression system's vapor cycle. The graph below highlights the modes of operation from the graph above for clarity.



We, the representatives of Hallowell International, wish to encourage the Department of Energy to consider quick action in amending the current CFR Part 430 testing specifications to include 3-speed equipment. Hallowell, as a manufacturer, relies on third party performance testing and verification of performance from AHRI against competitive equipment to gain traction in the marketplace. Since AHRI adopts their 210/240 standard from CFR Part 430, changes made to the CFR will carry through to AHRI, allowing Hallowell systems to be fairly listed on the directory with other competitive heat pump systems.

We believe that our equipment brings great advancement to the HVAC industry and provides a unique alternative to fossil fuels in today's changing energy climate. It is difficult to build sales volume and gain the credibility, required as an OEM, when there are no standards to provide performance ratings for the equipment, which would entitle our customers to rebates, tax credits, or other incentives.

We hope that a temporary waiver will be granted acknowledging that our three speed product is not covered by a current standard. We further hope that an amendment to the existing standards will be considered, or an alternate test procedure waiver will be considered, as 3-speed equipment does not need to have an entirely new process to be considered and implemented.

If there are any questions or concerns about the equipment please do not hesitate to contact us directly. We will freely share information about Boosted Compression such that your requirements and due diligence will be satisfied in this matter.

Please direct all correspondence with Hallowell International to:

Joseph M Gross
Design Engineer
Hallowell International

Phone: 207 990 5600 Extension 121
Fax: 207 990 5602
E-mail: *JGross@gotohallowell.com*

Signed,

Duane A. Hallowell,
President and CEO

Date:

Joseph M Gross,
Design Engineer

Date:

[FR Doc. E9–28694 Filed 12–1–09; 8:45 am]

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DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. IC09–715–001]

Commission Information Collection Activities (FERC–715); Comment Request; Submitted for OMB Review

November 23, 2009.

AGENCY: Federal Energy Regulatory Commission.

ACTION: Notice.

SUMMARY: In compliance with the requirements of section 3507 of the Paperwork Reduction Act of 1995, 44 U.S.C. 3507, the Federal Energy Regulatory Commission (Commission or FERC) has submitted the information collection described below to the Office of Management and Budget (OMB) for review of the information collection requirements. Any interested person may file comments directly with OMB and should address a copy of those comments to the Commission as explained below. The Commission received one comment in response to the **Federal Register** notice (74FR47566, 9/16/2009). FERC has summarized and addressed the commenter's suggestions below and in its submission to OMB.

DATES: Comments on the collection of information are due by January 4, 2010.

ADDRESSES: Address comments on the collection of information to the Office of Management and Budget, Office of Information and Regulatory Affairs, *Attention:* Federal Energy Regulatory Commission Desk Officer. Comments to OMB should be filed electronically, c/o *oira__submission@omb.eop.gov* and include OMB Control Number 1902–0171 as a point of reference. The Desk Officer may be reached by telephone at 202–395–4638. A copy of the comments should also be sent to the Federal Energy Regulatory Commission and should refer to Docket No. IC09–715–001. Comments may be filed either electronically or in paper format. Those persons filing electronically do not need to make a paper filing. Documents filed electronically via the Internet must be prepared in an acceptable filing format and in compliance with the Federal Energy Regulatory Commission submission guidelines. Complete filing instructions and acceptable filing formats are available at *http://www.ferc.gov/help/submission-guide/electronic-media.asp.* To file the document electronically, access the Commission's Web site and click on Documents & Filing, E–Filing *(http://www.ferc.gov/docs-filing/efiling.asp),* and then follow the instructions for each screen. First-time users will have to establish a user name and password. The Commission will send an automatic acknowledgement to the sender's e-mail address upon receipt of comments.

For paper filings, an original and 2 copies of the comments should be submitted to the Federal Energy Regulatory Commission, Secretary of the Commission, 888 First Street, NE., Washington, DC 20426, and should refer to Docket No. IC09–715–001.

All comments may be viewed, printed or downloaded remotely via the Internet through FERC's homepage using the ''eLibrary'' link. For user assistance, contact *fercolinesupport@ferc.gov* or toll-free at (866) 208–3676 or for TTY, contact (202) 502–8659.

FOR FURTHER INFORMATION CONTACT: Ellen Brown may be reached by telephone at (202) 502–8663, by fax at (202) 273–0873, and by e-mail at *ellen.brown@ferc.gov.*

SUPPLEMENTARY INFORMATION: The FERC–715 (''Annual Transmission Planning and Evaluation Report,'' OMB Control No. 1902–0171) is a mandatory filing described at 18 CFR 141.300. The FERC–715 must be submitted by each transmitting utility that operates integrated (that is, non-radial) transmission facilities at or above 100 kilovolts. [An overview and current instructions for filing the FERC–715 are posted on the FERC Web site at: *http://www.ferc.gov/docs-filing/eforms/form-715/instructions.asp.*]

Section 213 (b) of the Federal Power Act (FPA), as amended by the Energy Policy Act of 1992, requires FERC to collect, annually from transmitting utilities, sufficient information about their transmission systems to inform potential transmission customers, state regulatory authorities, and the public, of available transmission capacity and constraints. FERC–715 also supports the Commission's expanded responsibilities under Sections 211, 212, 213(a), 304, 307(a), 309, and 311 of the FPA, as amended, for reviewing reliability issues, market structure relationships, and in rate and other regulatory proceedings.

A summary of the comment filed, FERC's response, and proposed changes to the requirements follow.

a. *Comment:* FERC Order No. 890 now requires regional transmission planning processes. We suggest that respondents be allowed to refer to Attachment K information already available on Regional Planning Web sites.

FERC response: Respondents are already encouraged to incorporate references to readily available information when preparing their FERC–715 submissions. External information is most often used in Part IV, Transmission Planning Reliability Criteria. However, Order No. 890 does not require utilities to file power flow data or maps with the Commission or otherwise make this data available. Therefore, FERC–715 is the only source for these items.

b. *Comment:* The commenter suggests FERC should allow filing via the Internet, as well as on CDs, DVDs, diskettes, or in hard copy.

FERC response: The Commission agrees that Internet filing has the potential to reduce the burden to industry. Respondents are already given the option of filing via the Internet (through eFiling), if the submission can be completed using acceptable file formats. Filings may also be made on CD or DVD. The option of using diskettes is being eliminated, however, due to advances in technology and file sizes being too large for the medium.

c. *Comment:* The commenter suggests that a list of changes be provided when the FERC–715 instructions are updated.

FERC response: FERC agrees and will provide this information to respondents beginning with the 2010 filing.

d. *Comment:* Certain parts of FERC–715 need only be updated when information changes from previous filings. The commenter suggests that respondents be required to report the last filing date of information that is unchanged.

FERC response: FERC agrees and will incorporate this requirement into the FERC–715 instructions. To reduce the burden on industry, if this date is prior to the 2010 filing deadline, Respondents need only state that the previous filing was ''prior to the 2010 filing.''

e. *Comment:* FERC–715 responses are considered Critical Energy Infrastructure Information (CEII), and parties requesting access to this data must be vetted and approved by FERC. These parties may also request CEII directly from FERC–715 respondents.