[6450-01-P]

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Case No. CAC-041]

Notice of Petition for Waiver of ECR (ECR) International, Inc. from the Department of Energy Residential Central Air Conditioners and Heat Pumps Test Procedure, and Grant of Interim Waiver

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

ACTION: Notice of petition for waiver, notice of grant of interim waiver, and request for comments.

SUMMARY: This notice announces receipt of and publishes a petition for waiver and application for interim waiver ("petition") from ECR International, Inc. (ECR) regarding specified portions of the U.S. Department of Energy (DOE) test procedure for determining the energy consumption of residential central air conditioners and heat pumps. In its petition, ECR provides an alternate test procedure specific to EMI multi-zone unitary small air conditioners and heat pumps. DOE solicits comments, data, and information concerning ECR's petition and the suggested alternate test procedure. Today's notice also grants ECR an interim waiver from the existing DOE test procedures for the subject EMI (Enviromaster International) multi-zone unitary small air conditioners and heat pumps.

DATES: DOE will accept comments, data, and information with respect to the ECR Petition until, but no later than **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You may submit comments, identified by case number "CAC-041," 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 the case number [Case No. CAC-041] in the subject line of the message.
- Mail: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, Mailstop EE-2J/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.

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, Washington, DC, 20024; (202) 586-2945, between 9:00 a.m. and 4:00 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

waivers and rulemakings regarding similar refrigerator-freezer products. Please call Ms. Brenda Edwards at the above telephone number for additional information.

FOR FURTHER INFORMATION CONTACT: Mr. Bryan Berringer, U.S. Department of Energy, Building Technologies Program, Mail Stop EE-2J, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 586-0371. E-mail: Bryan.Berringer@ee.doe.gov.

Ms. Jennifer Tiedeman, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC-71, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0103. Telephone: (202) 287-6111. E-mail: mailto:Jennifer.Tiedeman@hq.doe.gov.

SUPPLEMENTARY INFORMATION:

I. Background and Authority

Title III, Part B of the Energy Policy and Conservation Act of 1975 (EPCA), Pub. L. 94-163 (42 U.S.C. 6291-6309, as codified), added by Pub. L. 95-619, Title IV, § 441(a), established the Energy Conservation Program for Consumer Products Other Than Automobiles, a program covering most major household appliances, which includes the residential central air conditioners and heat pumps that are the focus of this notice.[1] Part B includes definitions, test procedures, labeling provisions, energy conservation standards, and the authority to require information and reports from manufacturers. Further, Part B authorizes the Secretary of Energy to prescribe test procedures that are reasonably designed to produce results which measure the energy efficiency,

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

energy use, or estimated annual operating costs of a covered product, and that are not unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) The test procedure for residential central air conditioners and heat pumps is contained in 10 CFR part 430, subpart B, appendix M (referred to in this notice as "Appendix M").

The regulations set forth in 10 CFR part 430.27 contain provisions that enable a person to seek a waiver from the test procedure requirements for covered products. The Assistant Secretary for Energy Efficiency and Renewable Energy (the Assistant Secretary) will grant a waiver if it is determined that the basic model for which the petition for waiver was submitted contains one or more design characteristics that prevents testing of the basic model according to the prescribed test procedures, or if the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 430.27(l). A petitioner must include in its petition any alternate test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption. The Assistant Secretary may grant the waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(l). Waivers remain in effect pursuant to the provisions of 10 CFR 430.27(m).

The waiver process also allows the Assistant Secretary to grant an interim waiver from test procedure requirements to manufacturers that have petitioned DOE for a waiver of such prescribed test procedures. 10 CFR 430.27(g). An interim waiver remains in effect for 180 days

or until DOE issues its determination on the petition for waiver, whichever occurs earlier. DOE may extend an interim waiver for an additional 180 days. 10 CFR 430.27(h).

II. Petition for Waiver of Test Procedure and Application for Interim Waiver

On March 26, 2013, ECR submitted a petition for waiver and application for interim waiver ("petition") from the test procedure applicable to residential central air conditioners and heat pumps set forth in 10 CFR part 430, subpart B, appendix M. ECR seeks a waiver from the applicable test procedure because, ECR asserts that the prescribed test procedures yield results that are unrepresentative of actual energy consumption for ECR's Enviromaster International ("EMI") line of multi-zone unitary small air conditioners and heat pumps. In its petition, ECR asserts that the DOE test procedures currently applicable to these products do not sufficiently address the unique configuration of those products, and therefore do not produce results that are (1) representative of their energy consumption characteristics or (2) consistent, accurate and repeatable. In order to be assured that it is correctly calculating the energy consumption of the product, that it meets the minimum energy requirements for its product class, and is properly labeled, ECR proposes to use an alternate test procedure for testing its models.

ECR also requests an interim waiver from the existing DOE test procedure. An interim waiver may be granted if it is determined that the applicant will experience economic hardship if the application for 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 of the petition for waiver. 10 CFR 430.27(g).

DOE has determined that ECR's application for interim waiver does not provide sufficient market, equipment price, shipments and other manufacturer impact information to permit DOE to evaluate the economic hardship ECR might experience absent a favorable determination on its application for interim waiver. However, DOE has determined based upon a technical evaluation of ECR's proposed alternate test method and the characteristics of the products addressed by the petition, that it is likely ECR's petition will be granted, and that it is desirable for public policy reasons to grant ECR relief pending a determination on the petition. DOE has determined that it is desirable to have similar basic models tested in a consistent manner.

For the reasons stated above, DOE grants ECR's application for interim waiver from testing of its multi-zone unitary small air conditioners and heat pumps product line. Therefore, it is ordered that:

The application for interim waiver filed by ECR is hereby granted for the specified ECR multi-zone unitary small air conditioners and heat pumps basic models, subject to the specifications and conditions below. ECR shall be required to test or rate the specified multi-zone unitary small air conditioners and heat pumps products according to the alternate test procedure as set forth in section III, "Alternate Test Procedure."

The interim waiver applies to the following basic model groups:

S2CG2200D, S2CG9200D, S2CG9900D, T2CG2400D, T2CG4400D, T2CG8800D, T2CG9800D, T3CG2220D, T3CG2240D, T3CG9920D, T3CG9980D, T3CG9990D, T4CG2222D, T4CG9922D, T4CG9992D, T4CG9999D, S2HH2200D, S2HH9200D, S2HH9900D, T2HG2400D, T2HG4400D, T2HG8800D, T2HG9800D, T3HG2220D, T3HG2240D, T3HG9920D, T3HG9980D, T3HG9990D, T4HG2222D, T4HG9922D, T4HG9992D, T4HG9999D

DOE makes decisions on waivers and interim waivers for only those models specifically set out in the petition, not future models that may be manufactured by the petitioner. ECR may submit a subsequent petition for waiver and request for grant of interim waiver, as appropriate, for additional models of its multi-zone unitary small air conditioners and heat pumps for which it seeks a waiver from the DOE test procedure. In addition, DOE notes that a grant of an interim waiver or waiver does not release a petitioner from the certification requirements set forth at 10 CFR part 429.

Further, this interim waiver is conditioned upon the presumed validity of statements, representations, and documents provided by the petitioner. DOE may revoke or modify this interim waiver at any time upon a determination that the factual basis underlying the petition for waiver is incorrect, or upon a determination that the results from the alternate test procedure are unrepresentative of the basic models' true energy consumption characteristics.

III. Alternate Test Procedure

EPCA requires that manufacturers use DOE test procedures to make representations about the energy consumption and energy consumption costs of products covered by the statute. (42 U.S.C. 6293(c)) Consistent representations are important for manufacturers to use in making representations about the energy efficiency of their products and to demonstrate compliance with applicable DOE energy conservation standards. Pursuant to its regulations applicable to waivers and interim waivers from applicable test procedures at 10 CFR 430.27, DOE will consider setting an alternate test procedure for ECR in a subsequent Decision and Order.

In its petition, ECR states that for its multi-zone unitary small air conditioners and heat pumps models, tests using the DOE test procedure for residential central air conditioners and heat pumps at 10 CFR part 430, subpart B, appendix M ("Appendix M") is inapplicable to their products and would result in measurements of energy use that are not representative of these models' actual energy use. Thus, during the period of the interim waiver granted in this notice, ECR shall test its multi-zone unitary small air conditioners and heat pump basic models according to the existing DOE test procedure at 10 CFR part 430, subpart B, appendix M with the modifications set forth below.

1. Section 3.1.4.1.2 is replaced with the following:

3.1.4.1.2 Cooling Full-load Air Volume Rate for Non-ducted Units. For non-ducted units, run the unit in a free air state (i.e., without the plenum, duct work, and air sampling apparatus attached to the outlet of the indoor unit) at the A test conditions. After condensate has dripped from the coil for no less than 10 minutes and air entering the indoor unit meets the specified test conditions, measure and record the blower motor RPM, current, and power

consumption for each indoor unit. For all tests that require the Cooling Full-load Air Volume Rate, adjust the air flow until the blower motor has the same RPM, current, and power consumption as measured when operating in a free air state.

2. Section 3.1.4.4.4 is replaced with the following:

3.1.4.4.4 Non-ducted heat pumps, including non-ducted heating-only heat pumps. For non-ducted heat pumps, run the heat pump in a free air state (i.e., without the plenum, duct work, and air sampling apparatus attached to the outlet of the indoor unit) at the H1 test conditions. After the unit has operated for 30 minutes and the air entering the indoor unit meets the specified test conditioners, measure and record the blower motor RPM, current, and power consumption for each indoor unit. For all tests that require the Heating Full-load Air Volume Rate, adjust the air flow until the blower motor has the same RPM, current, and power consumption as measured when operating in a free air state.

3. In performance of section 3.1.7 when testing a non-ducted air conditioner, establish the Cooling Full-load Air Volume Rate first according to section 3.1.4.1.2 prior to conducting the A, B, C, or D tests. When testing a non-ducted heat pump establish the Heating Full-load Air Volume Rate first according to section 3.1.4.4.4. When conducting an optional cyclic test, always conduct it immediately after the steady-state test that requires the same test conditions. For variable-speed systems, the first test using the Cooling Minimum Air Volume Rate should precede the EV Test if one expects to adjust the indoor fan control options when preparing for the first Minimum Air Volume Rate test. Under the same circumstances, the first test using the Heating Minimum Air Volume Rate should precede the H2V Test. When testing multi-split

systems where each indoor unit operates independently and has an independent refrigeration circuit, conduct a set of cooling and/or heating tests, if applicable, for each indoor unit individually, but run all units during each test. To measure the cooling capacity conduct the tests specified in section 3.2.1 for each indoor unit. To measure the heating performance, conduct the tests specified in section 3.6.1 for each indoor unit.

4. In section 3.3, perform the pretest interval in paragraph (a) as written, except for non-ducted units use the exhaust fan or the airflow measuring apparatus to obtain and then maintain the blower motor RPM, current, and power consumption as measured when operating in a free air state, according to section 3.1.4.1.2. Locate the pressure tap for each air handler first at the prescribed ASHRAE 41.2 distance of 2*SQRT(A*B) and then adjust the position by moving the installation point closer or further away from the air handler until the 0.0 inch of water column point is located.

For multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, sum the average total space cooling capacity of each individual indoor unit test and assign to Qc(T), and take the mean of the average electrical power consumption for each individual indoor unit test assign to Ec(T). Replace the “T” with the nominal outdoor temperature at which the test was conducted.

5. In performance of section 3.4, for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, sum the total space cooling capacity

of each individual indoor unit test and assign to Qss,dry, and take the mean of the average electrical power consumption for each individual indoor unit test and assign to Ess,dry.

6. In performance of section 3.5, for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, sum the total space cooling of each individual indoor unit test and assign to $q_{cyc,dry}$, and take the mean of the electrical energy consumption of each indoor unit test and assign to $e_{cyc,dry}$.

7. In performance of section 3.5.3, for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, take the average of the result from the cooling load factor calculation performed for each individual indoor unit test and assign to CLF.

8. In performance of section 3.7, the pretest interval of paragraph (a) shall be performed as written, except use the exhaust fan or the airflow measuring apparatus to obtain and then maintain the blower motor RPM, current, and power consumption as measured when operating in a free air state, according to section 3.1.4.4.4. Locate the pressure tap for each air handler first at the prescribed ASHRAE 41.2 distance of 2*SQRT(A*B) and then adjust the position by moving the installation point closer or further away from the air handler until the 0.0 inch of water column point is located.

To calculate the overall result of the section 3.7 tests for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, sum the average

space heating capacity of each individual indoor unit test and assign to $Q_h(T)$, and take the average of the electrical power consumption of each individual indoor unit test and assign to $E_h(T)$. Replace the "T" with the nominal outdoor temperature at which the test was conducted.

9. In performance of section 3.8, for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, sum the total space heating of each individual indoor unit test and assign to q_{cyc}, and take the average of the electrical energy consumption of each individual indoor unit test and assign to e_{cyc}.

10. In performance of section 3.8.1, for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, take the mean of the result from the heating load factor calculation performed for each individual indoor unit test and assign to HLF.

11. In performance of section 3.9.1, for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, perform the calculations specified in section 3.9.1a though section 3.9.1d, as needed, for each indoor unit and assign to $Q_h^k(35)$ the sum of the capacity results and assign to to $E_h^k(35)$ the average of the power results.

12. In performance of section 3.9.2, for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, determine the demand defrost credit for each indoor unit and assign the average of the result to $F_{def.}$

13. In performance of section 3.10, for multi-split systems where each indoor unit operates independently and has an independent refrigeration circuit, sum the average space heating capacity of each individual indoor unit test and assign to $Q_h^k(17)$, and take the mean of the electrical power consumption of each indoor unit and assign to $E_h^k(17)$.

IV. Summary and Request for Comments

Through today's notice, DOE announces receipt of ECR's petition for waiver from the test procedures applicable to residential central air conditioners and heat pumps, and grants an interim waiver to ECR. As part of this notice, DOE is publishing ECR's petition for waiver in its entirety pursuant to 10 CFR 431.401(b)(1)(iv). Confidential business information has been redacted from the petition. The petition includes a suggested alternate test procedure to measure the energy consumption of central air conditioners and heat pumps basic models. Furthermore, today's notice includes an alternate test procedure that ECR is required to follow as a condition of its interim waiver. ECR would be required to use this modified version of the Appendix M for testing and rating its products in accordance with the testing and certification requirements of 10 CFR part 429.

DOE solicits comments from interested parties on all aspects of the petition. Any person submitting written comments to DOE must also send a copy of such comments to the petitioner. 10 CFR 430.27(d). The contact information for the petitioner is: Ronald J. Passafaro, President and Chief Executive Officer, ECR International, Inc., 2201 Dwyer Ave., Utica, NY 13501. 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).

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 to DOE: 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.

Issued in Washington, DC, on July 31, 2013.

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

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March 26, 2013

U.S. Department of Energy
Building Technologies Program
Test Procedure Waiver
1000 Independence Avenue, SW, Mailstop EE-2J
Washington, DC 20585-0121

Dr. David Danielson
Assistant Secretary for Conservation and Renewable Energy
U.S. Department of Energy
Forrestal Building
1000 Independence Avenue, SW
Washington, DC 20585-0121

Re: Petition for Waiver and Application for Interim Waiver, ECR International, Inc.: Multi-Zone Unitary Small Air Conditioners and Heat Pumps

Dear Dr. Danielson:

ECR International, Inc. ("ECR") respectfully submits this petition for waiver and application for interim waiver of the Department of Energy ("Department") test procedures defined in 10 CFR 430, Subpart B, Appendix M, which incorporate by reference the following third party standards: AHRI 210/240-2008, AHRI 1230-2010, and ASHRAE 41.2, on the grounds that the prescribed test procedures yield results that are unrepresentative of actual energy consumption for ECR's Enviromaster International ("EMI") line of multi-zone unitary small air conditioners and heat pumps.

Company Background

ECR, with headquarters in Utica, New York, is a full-service provider of American engineered and manufactured boilers, water heaters, hydronic and forced air products at its facilities in Utica and Dunkirk, NY. ECR and its predecessor companies have been located in New York State since 1928 and employ a full-time workforce of [redacted]. As a full-service provider of American engineered-and-manufactured hydronic and forced air products, ECR is recognized for its innovation, quality, performance and reliability, and is the only North American company to make and market all of these products under one corporate roof. Our products are sold under

multiple brands in addition to EMI, including Airco, Argo, Dunkirk, Olsen, Pennco, RetroAire, and Utica.

The Affected Products

The affected line of products—condensers serving the EMI brand of fixed speed multi-zone systems--subject to this petition and application are listed herein at Appendix A. The company's unitary product line is AHRI-certified under both Unitary Small Air Conditioning (USAC) and Unitary Small Heat Pumps (USHP) programs. The multi-zone products use the same models of compressors, indoor air handlers, reversing valves, accumulators, line sets, thermostats, tubing diameters, expansion valves, and indoor air handlers as the single-zone fixed-speed 13 SEER systems manufactured by ECR. While the multi-zone outdoor coil is physically different than the single-zone outdoor coil, it is comparable in performance per zone to its single-zone capacity counterpart. As such, the system/circuit performance was expected to be near identical to the single-zone performance. This belief was confirmed in ECR's own psychrometric laboratory, i.e. that the multi-zone circuit-to-circuit metrics were nearly identical to the single-zone metrics. This relationship between the two systems, however, is not borne out through AHRI certification tests, where tests have rated the product as low as [redacted].

Overview

The test procedures currently being applied to the affected line of products are in fact inapplicable to those products, and therefore unrepresentative of the energy consumption characteristics of the products at issue, in the following ways: (1) they do not appropriately classify the applicable systems manufactured by ECR; (2) there is no authoritative standard that can be accurately applied to ECR's products; (3) as a result of these factors, the current testing procedures do not produce consistent, accurate and repeatable data. ECR herein provides an alternative testing procedure for the affected products.

1. The test procedures do not appropriately classify the applicable systems manufactured by ECR.

ECR's fixed speed multi-zone systems are comprised of multiple independent refrigeration circuits sharing a single outdoor fan and defrost logic. Each circuit has a single fixed speed compressor, a single air handler, a single control circuit, with individual expansion, without any mixing of refrigerant between the zones. Each fully independent circuit can have different loading, cycle on and off independent of the other zones, as well as operate in different modes (heat/cool) simultaneously. The design is merely a collection of single-zone systems built into a common chassis to reduce the condenser footprint. As stated above, the multi-zone and single-zone systems manufactured by ECR utilize many of the same components.

The current certification testing does not measure the loading of each individual circuit of the system. Under current test procedures, a multi-zone system consisting of 4 equal capacity circuits with 4 identical air handlers is logically expected to evenly distribute the total capacity at 25% per zone. While this logic is valid for VRF- based multi-zone systems running all refrigerant through a single compressor, it is not applicable when evaluating multiple

independent circuits. The test procedures do not verify the individual circuit performance, and instead only record the total. This results in an averaging of the individual circuits' performance, whereas a summation of the individual circuits would be more representative of the true system performance. Without each circuit having individual performance data collected, it is impossible to assess the true performance of the test series after the fact, due to the lack of collected data. If the current test logic is not applicable to the simple 4 equal capacity circuit system, its use with the more complex unequal capacity circuitry system is even less so.

ECR proposes that a fixed speed multi-zone system have data collected and reduced for each individual circuit, then perform a summation of the individual circuits to arrive at the total system performance. This method would require the collection of the data required to independently verify the system's performance. The existing method of only recording the combined performance of the system doesn't record the values needed to determine that all zones are operating within acceptable limits. The absence of the required detail data prevents any analysis regarding what wasn't correct in either the set-up of the equipment or the operation of the equipment itself.

2. As a result of the differences between standards authorities discussed below, there are no approved standard procedures that apply to the product line of ECR at issue.

ASHRAE 41.2, "Standard Methods for Laboratory Airflow Measurement", does not address the measurement of multiple zero static airflow. Section 7.4 of same states that "each plenum shall have an adjustable restrictor (damper) located in the plane where the plenums enter the common duct section for the purpose of equalizing the static pressures in each plenum." This ASHRAE requirement conflicts with the requirements in 10 CFR Part 430 Subpart B Appendix M § 3.5.2 which states, "Do not use air dampers when conducting cyclic tests on non-ducted units."

Furthermore, the diagrams in ASHRAE 41.2, at figures 8A and 8B, do not consistently result in accurate static pressure values when applied to zero static equipment. The AHRI Ductless Equipment Section Engineering Committee recently voted to allow multiple zero static air handlers to discharge into a large cubic plenum without any gradual transitions, contradicting ASHRAE 41.2 figure 9, which shows a 15º converging transition and a 7º diverging transition.

3. As a result of the lack of classification for ECR's product and lack of standardization in testing for that product, ECR is subject to arbitrary and inconsistent testing practices for its product line.

There are many "best practice" procedures available amongst the myriad of test laboratories, and these procedures have been implemented without input from ECR. Typically, these procedures are not published for peer review, and are inconsistent in the accuracy of results. The existing published procedures do not yield consistent, accurate, and repeatable data between different psychrometric laboratories.

The primary error occurs when the laboratory tries to analogize the performance within a duct to the performance of a free discharge zero static blower and a second air handler is combined into a common enthalpy tunnel. When attempting to join multiple air handlers into a common duct, each air handler has an influence on the other air handler's performance. Ideally, each air handler should have blower motor voltage, current, and angular velocity measured prior to the connection of a duct or transition piece. Upon connection of the duct, those same values should be attained as verification that the air moving device is working in a similar manner with the duct as it did without the duct. At that point, the location of the 0.0 inWC pressure tap can be located, starting at the ASHRAE 41.2 recommended standard (2*SQRT(A*B)). Different air handlers will have different locations for the zero static pressure point due to the differing air velocities at the discharge grill of the air handler. It is only by matching the motor's electrical current draw and revolutions per minute between the free air delivery and ducted delivery that equivalent performance can be verified. An iterative approach is required in order to achieve an accurate, balanced air flow measurement.

4. The following alternate procedures are proposed:

A. Air Flow Measurement

1) With laboratory rooms at conditions for capacity tests, refrigeration circuits in operation, and free air operation (without ducts), measure and record the blower motor RPM, current, and power consumed by each indoor air handler running with a wet evaporator independently.
2) Connect the duct between a single air handler and enthalpy tunnel. Restart the entire system and adjust the air flow until the now ducted blower motor has same RPM and current draw as seen in step 1. The static pressure tap can now be applied to that point on the duct that is actually operating at zero static via empirical methods. The point along the duct operating at zero static will vary proportionally with the discharge velocity of the air handler.
3) Air flow should be measured only when the RPM and power of the blower while connected to a duct matches that of the motor when running without a duct. This ensures that the zero static air mover is acting equivalently to free discharge. The location of the pressure tap can be found for each air handler by locating the "0.0 inch water column" pressure along the duct, starting at the prescribed ASHRAE 41.2 distance of 2*SQRT(A*B) and then moving closer or further away from the air handler until the 0.0 inch of water column point is located. Each type and capacity air handler will be slightly different due to the differences in discharge air velocity.
4) Tangential wheel blowers do not generate static pressure well. The more common centrifugal blower can generate static pressures within a duct to damp the variations in the discharged air flow, while the tangential wheel can only vary the speed of the discharged air in response to ambient parameters. Or stated another way, Bernoulli's equation has both the gravitational and pressure terms equal to zero in a zero static environment, leaving only the velocity term with a non-zero value and a very sensitive flow system. Any changes in static pressure must come from a change in air velocity, there is no other mechanism available.

B. Establishment of actual system performance

1) Due to this condenser design being a collection of independent refrigeration circuits, the test methodology should evaluate individual systems and then sum the results of circuits to arrive at accurate performance metrics, instead of averaging the results without knowing the performance of each individual circuit.
2) ECR's proposed procedure would run all zones during the test, but measure the performance of each individual zone, one at a time. This method minimizes the errors of multiple combined zero static air handlers by ensuring that each circuit is operating properly prior to the collection of data and calculation of DOE metrics. The data recording and reduction shall not occur until there is certainty that each independent zone is operating at its correct individual performance.

It should be noted that this product line has received waivers from the Department of Energy in the past, specifically for Limited Range Multi-Zone Heat Pumps. However, these waivers were rescinded due to the published test procedures becoming applicable to all unitary products. These waivers designated the condensers as "limited range" heat pumps to allow for their inability to defrost discrete zones. Controls were modified so as to allow individual zones to call for a defrost cycle thereby negating the need for a waiver.

Interim Waiver

ECR also requests that the Department provide immediate relief by grant of an interim waiver, for the following reasons:

1. The petition for the waiver is likely to be granted. The Department has, as discussed above, granted waivers for the multi-zone product line, albeit with a result towards test procedures being granted for unitary products which cannot be easily analogized to the multi-zone product of ECR. ECR's process furthers the goal of the Energy Conservation Policy Act, 42 U.S.C. §6291 *et seq*., to provide consumers with accurate information regarding the energy conservation attributes of the product.

2. Substantial economic harm and competitive disadvantage will result absent a favorable determination on this application. ECR sells [redacted] multi-zone systems per year and has realized on average $[redacted] in sales per year. However, it should be noted that multi-zone systems are usually a minor percentage of a larger order, used to solve limited condenser footprint challenges on site. The resulting economic impact is therefore closer to $[redacted], or nearly [redacted] of total sales, in overall lost sales when an individual sale is contingent on multi-zone availability. Furthermore, sales of ECR's remaining product lines will suffer without a multi-zone offering. As discussed above, ECR has a considerable history and economic impact in the communities in which it is located; Upstate New York, and Central and Western New York in particular, have suffered from decades of decline in the manufacturing sector.

The specific sales information in this section (2) should be exempt from mandatory public disclosure under the Freedom of Information Act, specifically 5 U.S.C.§552(b)(4). This information has not been made publicly available by ECR nor is it publicly available through alternative sources, and is typically proprietary to ECR and its competitors. Disclosure of this information would result in a substantial advantage to ECR's competitors and therefore substantial harm to ECR's competitive position.

Conclusion

ECR requests that the Department grant both the waiver and interim waiver from the existing testing procedures as defined in 10 CFR 430, Subpart B, Appendix M and the third-party standards incorporated by reference in that regulation, and that the alternative testing procedures discussed above be adopted and approved as a representative test procedure for ECR.

ECR would be pleased to discuss this waiver request with the Department and shall provide additional information as needed to the Department.

ECR International shall file a statement with the Department certifying the names and address of each person to whom the notice of Petition for Waiver and Application for Interim Waiver has been sent.

Very truly yours,
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APPENDIX A

The following condenser basic model numbers comprise the scope of this Petition for Waiver and Application for Interim Waiver, where each of the individual circuits of a multi-zone condenser can have one of three air handlers combined with it to obtain over 270 unique, complete systems.
S2CG2200D, S2CG9200D, S2CG9900D, T2CG2400D, T2CG4400D, T2CG8800D, T2CG9800D, T3CG2220D, T3CG2240D, T3CG9920D, T3CG9980D, T3CG9990D, T4CG2222D, T4CG9922D, T4CG9992D, T4CG9999D, S2HH2200D, S2HH9200D, S2HH9900D, T2HG2400D, T2HG4400D, T2HG8800D, T2HG9800D, T3HG2220D,

T3HG2240D, T3HG9920D, T3HG9980D, T3HG9990D, T4HG2222D, T4HG9922D, T4HG9992D, T4HG9999

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