CASE NO. 14 – 60535

IN THE UNITED STATES COURT OF APPEALS
FOR THE FIFTH CIRCUIT

LENNOX INTERNATIONAL, INCORPORATED & AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE,

Petitioners,

v.

UNITED STATES DEPARTMENT OF ENERGY & ERNEST MONIZ, In his official capacity as Secretary, United States Department of Energy,

Respondents.

ON PETITION FOR REVIEW OF ORDERS OF THE DEPARTMENT OF ENERGY

BRIEF OF INTERVENOR HUSSMANN CORPORATION IN SUPPORT OF PETITIONERS

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April 9, 2015

IN THE UNITED STATES COURT OF APPEALS
FOR THE FIFTH CIRCUIT

LENNOX INTERNATIONAL, INC. AND AIR-CONDITIONING, HEATING AND REFRIGERATION INSTITUTE, Petitioners, v. UNITED STATES DEPARTMENT OF ENERGY and ERNEST MONIZ, In his official capacity as Secretary, United States Department of Energy, Respondents.	No. 14-60535

CERTIFICATE OF INTERESTED PERSONS

Pursuant to Fifth Circuit Rule 28.2.1 and Federal Rule of Appellate Procedure 26.1(a), the undersigned counsel of record for Hussmann Corporation hereby files this Certificate of Interested Persons, which lists all persons, associations of persons, firms, partnerships, corporations, guarantors, insurers, affiliates, parent corporations, or other legal entities known to counsel who or which are financially interested in the outcome of this litigation.

The undersigned counsel of record certifies that the following listed persons and entities as described in the fourth sentence of Rule 28.2.1 have an interest in

the outcome of this case. These representations are made in order that the judges of this Court may evaluate possible disqualification or recusal.

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Hussmann Corporation is owned by Hussmann Parent Inc., which is owned by CD&R Hussmann Holdings LP (Cayman) and Ingersoll Rand Holdings BV (Netherlands), 63% and 37% respectively. CD&R Hussmann Holdings LP (Cayman) is a private equity firm, no shares of which are publicly held. Ingersoll Rand Holdings BV (Netherlands) is a wholly-owned subsidiary of Ingersoll-Rand PLC, which is publicly traded.

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STATEMENT REGARDING ORAL ARGUMENT

Intervenor Hussmann Corporation ("Hussmann") adopts the Statement Regarding Oral Argument of Lennox International, Incorporated and the Air-Conditioning, Heating, and Refrigeration Institute (collectively "Petitioners").

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STATEMENT OF JURISDICTION

Hussmann adopts Petitioners' Statement of Jurisdiction. Pet. Br. at 2-3.

QUESTIONS PRESENTED

Hussmann adopts Petitioners' Questions Presented. *Id.* at 4.

STATEMENT OF THE CASE AND FACTS

Hussmann adopts Petitioners' Statement of the Case and Facts, *id.* at 4-20, and provides the following additional context.

Walk-in coolers and freezers ("WICF") are large, commercial-grade chambers commonly used in supermarkets and restaurants to store refrigerated or frozen food or other perishable goods, and for other applications requiring a temperature-controlled environment. WICFs are made of the following constituent components: panels that make up the walls, floor, and ceiling; doors, which can be transparent "display" doors, or non-display doors; and a refrigeration system. *See* DOE Final Rule Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment; Walk-in Coolers and Walk-in Freezers (May 2014) ("TSD"), Doc. # 0131 at 3-1. A WICF refrigeration system consists of a unit cooler and a condensing unit. The unit cooler cools the WICF by using a heat exchanger to transfer heat from the WICF enclosure to a refrigerant, which then cycles out of the WICF enclosure. The condensing unit, which is located outside of the WICF enclosure, removes heat

from the refrigerant and prepares it for cycling back through the unit cooler. There are two types of WICF refrigeration systems: dedicated systems, which use only one condensing unit per WICF, and multiplex systems, in which unit coolers in multiple WICFs are served by condensers and compressors operating in parallel. *Id.* at 3-4.

In its Final Rule setting new energy efficiency standards for WICFs, Energy Conservation Program: Energy Conservation Standards for Walk-In Coolers and Freezers, 79 Fed. Reg. 32,050 (June 3, 2014) ("WICF Rule"), the Department of Energy ("DOE") analyzed and selected among several "Trial Standard Levels" ("TSL") corresponding to varying degrees of WICF energy efficiency. For each TSL, DOE derived separate efficiency standards for WICF refrigeration systems, panels, non-display doors, and display doors. *Id.* at 32,098. Because DOE separated each of the four WICF components into several equipment classes – 3 for panels, 2 for display doors, 4 for non-display doors, and 10 for refrigeration systems, *id.* at 32,068-70 – DOE developed distinct efficiency standards in each of these 19 equipment classes for each TSL. *Id.* at 32,100-01, Tables V.4 – V.10. Hussmann manufactures refrigeration systems for WICFs, and thus focuses on elements of the WICF Rule relating to refrigeration systems.

In the WICF Rule, DOE considered 3 TSLs. TSL 3 was the most stringent option DOE considered, and represented the "maximum technologically feasible"

("max-tech") energy efficiency improvements that could be achieved for each of the four different WICF components. *Id.* at 32,098 ("TSL 3 is the max-tech level for each equipment class for all components"). TSL 2, the next most stringent level, represented the maximum energy efficiency improvements that could be achieved while still maintaining a positive national net present value, calculated using a 7-percent discount rate. *Id.* ("TSL 2 represents the maximum efficiency level of the refrigeration system equipment classes with a positive NPV at a 7-percent discount rate, combined with the maximum efficiency level with a positive NPV at a 7-percent discount rate for each envelope component (panel, non-display door, or display door).") For refrigeration systems, TSL 2 called for the same level of energy efficiency improvements as TSL 3 – *i.e.*, the maximum technologically feasible level. *See id.* at 32,099, Table V.2 (listing the same compressor technology and efficiency level combinations in each row for TSL 2 and TSL 3), and *id.* at 32,101, Table V.10 (listing the same minimum AWEF equations and values for TSL 2 and TSL 3 for refrigeration systems). However, TSL 2 called for less stringent efficiency improvements for panels, doors, and display-doors than TSL 3. *Id.* at 32,100-01, Tables V.4 – V-8 (each listing different equations and numeric values for TSL 2 and TSL 3 for panels and doors). TSL 1, the least stringent level DOE considered, represented energy efficiency improvements that would maximize national net present value, again at a 7-percent discount rate. *Id.*

at 32,098 ("TSL 1 corresponds to the efficiency level with the maximum NPV at a 7-percent discount rate for refrigeration system classes and components.").

In the WICF Rule, DOE concluded that TSL 2 offered the "maximum improvement in efficiency that is technologically feasible and economically justified and will result in the significant conservation of energy," and therefore adopted standards at TSL 2. *Id.* at 32,117. On the basis of TSL 2, DOE adopted minimum annual walk-in energy factor ("AWEF") standards of 10.89 and 6.57, respectively, for the multiplex condensing, medium temperature and multiplex condensing, low temperature refrigeration system equipment classes. *Id.* at 32,124 (table added at 10 C.F.R. § 431.306(e)). A higher AWEF indicates higher WICF energy efficiency.

SUMMARY OF ARGUMENT

DOE has, in its final efficiency standards for the multiplex condensing refrigeration system equipment classes, erred in two significant respects. First, DOE adopted standards at TSL 2, but according to DOE's own analysis, the AWEF standard DOE adopted for multiplex condensing, low temperature systems cannot be met by low-capacity multiplex condensing, low temperature systems using TSL 2 technology. This makes the AWEF standard arbitrary and capricious, because the evidence and analysis DOE relied upon to set the standard does not support the AWEF standard DOE selected. DOE's standard is also inconsistent

with DOE's approach to other equipment classes, for which DOE generally adopted AWEF standards that allowed all subject refrigeration systems to comply using TSL 2 technology. Further, DOE has not provided any explanation why the AWEF standard it adopted for multiplex condensing, low temperature systems is reasonable, given that low-capacity systems cannot comply with the standard using TSL 2 technology.

Second, DOE made a key calculation error in its engineering analysis used to develop the standards for multiplex condensing refrigeration systems. DOE assumed that under a TSL 2 standard, all multiplex condensing refrigeration systems would use a variable-speed evaporator fan to save energy. However, in calculating AWEF for such systems using DOE's WICF test procedure, DOE erroneously used a formula only appropriate for multiplex systems with fixed-speed evaporator fans. This error had the effect of significantly increasing the numeric AWEF standards applicable to multiplex condensing systems. DOE's calculations of AWEF for multiplex systems are arbitrary and capricious because they are inconsistent with DOE's applicable test procedure, and thus they lead to AWEF standards that are too high.

Further, DOE violated its notice-and-comment obligations by failing to provide notice to the public that it would consider hot gas defrost as a design option for dedicated condensing systems. Had DOE provided appropriate notice,

Hussmann would have submitted substantive comments on the performance and reliability issues associated with hot gas defrost in cold climates.

STANDARD OF REVIEW

Hussmann adopts Petitioners' statement on Standard of Review. *See* Pet. Br. at 21-23.

ARGUMENT

Hussmann adopts Petitioners' statement on Argument, Pet. Br. at 23-68, and provides the following elaboration on certain arguments raised by Petitioners.

I. DOE Arbitrarily and Capriciously Set its TSL 2-based AWEF Standard for Multiplex Condensing, Low Temperature Systems At a Level That Cannot Be Achieved with TSL 2 Technology for Low-Capacity Systems.

In the WICF Rule, DOE adopted a minimum AWEF standard of 6.57 for multiplex condensing, low temperature systems on the basis of TSL 2. 79 Fed. Reg. at 32,117. DOE states that this standard level is based on TSL 2, but the standard cannot be met by low-capacity systems with the technologies that make up TSL 2.

To understand DOE's error, it is necessary to understand DOE's process for translating its TSLs into minimum AWEF standards (either in the form of a single numeric value or an equation that represents minimum AWEF). Because DOE made an error in translating TSL 2 into a minimum AWEF standard, when it

determined to adopt standards based on TSL 2, it adopted a flawed minimum AWEF standard.

In DOE's engineering analysis, DOE selected certain "analysis points" – representative units of different sizes – for each equipment class to model the energy and cost impacts of particular technologies on WICF refrigeration system and component efficiency. TSD, Doc. # 0131 at 5-2 – 5-6. For the multiplex condensing refrigeration system classes, DOE selected as analysis points multiplex systems with different evaporator coil fin spacing, numbers of fans, and capacities.[1] *Id.* at 5-4. For the multiplex condensing, low temperature equipment class, DOE selected seven analysis points. *Id.* at 5-6, Table 5.3.5; DOE Final Rule Engineering Analysis Refrigeration Spreadsheet ("DOE Refrigeration Spreadsheet"), Doc. # 0137, "Equipment Classes" tab (Rows 54–65). At each analysis point, DOE developed a range of potential "efficiency levels," each representing a distinct combination of technology "design options" that could be implemented to reduce WICF energy consumption, and modeled their cost and energy impacts.[2] DOE Refrigeration Spreadsheet, Doc. # 0137, "Calculation" tab,

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[1] For instance, DOE selected as an analysis point a multiplex condensing, low temperature system with (i) evaporator coil fin spacing at four fins per inch; (ii) a capacity of 40,000 Btu/h; and (iii) two fans. TSD, Doc. # 0131 at 5-6, Table 5.3.5 (last row). DOE assigned this analysis point an analysis point code of "MC.L.N.004.040.2." *Id.*

[2] For refrigeration systems, these design options included high-efficiency compressors; improved condenser coils; high-efficiency condenser fan motors;

Row 43 (displaying baseline design options in Column C and Efficiency Levels in Columns D through R). For each analysis point, at each efficiency level, DOE calculated an AWEF value. *See id.*, "Calculation" tab (Rows 35 and 36, entitled "Efficiency Level" and "AWEF"); *id.*, "Results Summary" tab (showing the AWEF of an analysis point for each Efficiency Level). This AWEF value represents DOE's estimate of what energy efficiency can be achieved for a particular kind of system by implementing the combination of technology design options associated with a particular efficiency level for that system.

DOE linked the AWEF values it developed for different analysis points to each of the TSLs as a means to quantify the energy and cost impacts of each of the TSLs. Table 1 lists the AWEF values DOE linked to TSLs for different multiplex system capacities. *See* 79 Fed. Reg. at 32,099, Table V.2 (displaying the same multiplex system capacities listed in Table 1 along with the technology combinations DOE linked to each TSL).

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improved condenser fan blades; condenser fan control; ambient sub-cooling; improved evaporator fan blades; evaporator fan controls; defrost controls; hot gas defrost; and head pressure control. *See* TSD, Doc. # 0131 at 5-42 – 5-53.

Table 1: DOE Multiplex System AWEF Values By TSL
(Derived from Table V.2, 79 Fed. Reg. at 32,099)

Equipment Class	Nom. Size (Btu/h)	Baseline	TSL 1	TSL 2	TSL 3
		AWEF	AWEF	AWEF	AWEF
Multiplex Condensing, Medium Temperature	4,000	6.67	11.26	11.26	11.26
	9,000	7.01	11.47	11.47	11.47
	24,000	6.11	10.89	10.89	10.89
Multiplex Condensing, Low Temperature	4,000	3.87	6.26	6.26	6.26
	9,000	3.61	5.94	5.94	5.94
	18,000	3.38	5.62	6.83	6.83
	40,000	3.29	5.58	6.57	6.57

From this matrix of TSLs and AWEF values, DOE derived numeric AWEF values to represent the baseline and each of the TSLs for both of the multiplex condensing classes. *Id.* at 32,101, Table V.10. DOE chose a single numeric AWEF value for the multiplex condensing classes, rather than an equation to account for varying system capacity, "because DOE found that equipment capacity did not have a significant effect on equipment efficiency." *Id.* at 32,100.

A. DOE Arbitrarily and Capriciously Selected An AWEF Value of 6.57 for the Multiplex Condensing, Low Temperature Equipment Class.

Generally, DOE derived a single numeric AWEF value to represent a TSL for an equipment class by choosing the minimum AWEF value calculated in the engineering analysis from the relevant analysis points. Thus, for instance, DOE chose an AWEF of 5.58 to represent the TSL 1 AWEF for the multiplex condensing, low temperature equipment class out of available analysis point

AWEFs of 6.26, 5.94, 5.62, and 5.58. *Id.* at 32,101, Table V.10. Similarly, DOE chose an AWEF of 10.89 to represent the TSL 2 AWEF for the multiplex condensing, medium temperature equipment class out of available analysis point AWEFs of 11.26, 11.47, and 10.89. *Id.* This approach permitted all systems in an equipment class, regardless of capacity, to use the particular technologies associated with a TSL to comply with the TSL.

However, DOE inexplicably failed to follow this methodology when it selected a TSL 2 numeric AWEF value for the multiplex condensing, low temperature system equipment class. For this class, DOE chose the numeric AWEF value 6.57, representing the second highest AWEF of the relevant analysis point AWEFs – 6.83, 6.57, 6.26, and 5.94. DOE's adoption of this numeric value, and its failure to adopt a TSL 2 numeric AWEF value of 5.94 consistent with its methodology of choosing the lowest AWEF level at TSL 2 for other equipment classes, constitutes arbitrary and capricious agency action that cannot be upheld.

DOE has failed to provide any explanation for its selection of the 6.57 AWEF value for the multiplex condensing, low temperature class, and has further failed to explain why it employed a methodology that is inconsistent with its approach to the selection of other numeric AWEF values for the multiplex condensing classes. To constitute reasoned decision-making that is not arbitrary and capricious, DOE is required to "articulate a satisfactory explanation for its

action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n of U.S., Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983) (quoting *Burlington Truck Lines v. United States*, 371 U.S. 156, 168 (1962)); *United States v. Garner*, 767 F.2d 104, 116 (5th Cir. 1985) ("the central focus of the arbitrary and capricious standard is on the rationality of the agency's decisionmaking"); *Owner-Operator Indep. Drivers Ass'n, Inc. v. Fed. Motor Carrier Safety Admin.*, 494 F.3d 188, 204 (D.C. Cir. 2007) (failure to explain the treatment of a single data point in an important step in the agency's regulatory calculation was arbitrary and capricious). Here, DOE has offered no explanation at all for the discrepancy in deriving minimum AWEF from the relevant analysis points, or for why its selection of an AWEF of 6.57 for the multiplex condensing, low temperature class constitutes reasoned decision-making.

Further, for certain dedicated condensing classes, DOE adopted linear equations based on capacity, rather than numeric constants, as minimum AWEF standard levels to enable lower-capacity systems to comply using TSL 2 technology. 79 Fed. Reg. at 32,100 ("DOE calculated the AWEF differently for small and large classes based on DOE's expectation that small-sized equipment may have difficulty meeting the same efficiency standard as large equipment."). For instance, for dedicated condensing, low temperature outdoor systems, DOE adopted a fixed AWEF standard of 4.79 for systems with a capacity of 9,000 Btu/h

or greater, but accommodated the lower efficiency of systems under 9,000 Btu/h with a less stringent standard that varies according to system capacity. *See* TSD, Doc. # 0131 at 10-13 (graphically depicting DOE's standard for dedicated condensing, low temperature outdoor systems in Figure 10.4.1, including a less stringent standard for low-capacity systems). Internal inconsistencies in numeric analysis underlying an agency rulemaking can make the rulemaking arbitrary and capricious. *See Prometheus Radio Project v. FCC*, 373 F.3d 372, 402 (3d Cir. 2004) (FCC did not adequately justify limits on local television ownership because of flawed assumptions in underlying technical analysis). *See also Air Line Pilots Ass'n v. FAA*, 3 F.3d 449, 454 (D.C. Cir. 1993) (fundamental internal inconsistencies in an agency action are arbitrary and capricious); *Texas Oil & Gas Ass'n v. EPA*, 161 F.3d 923, 933 (5th Cir. 1998) (agency rule is arbitrary and capricious if agency offers an explanation that is counter to the evidence). Given DOE's acknowledgment that low-capacity systems may have difficulty in meeting the same standard as large equipment in other equipment classes, DOE's failure to consider and accommodate lower-efficiency, lower-capacity systems in setting the multiplex condensing, low temperature system standard is arbitrary and capricious.

B. DOE's Minimum AWEF Value of 6.57 for the Multiplex Condensing, Low Temperature Equipment Class Exceeds the Maximum Feasible Technology, and Therefore Violates the Energy Policy and Conservation Act.

Even if DOE had offered a sufficient explanation for its anomalous selection of an AWEF standard for the multiplex condensing, low temperature class, DOE's minimum AWEF standard of 6.57 makes it impossible for small capacity multiplex condensing, low temperature class units to comply with the standard using TSL 2 technology. In the WICF Rule, DOE determined that for 4,000 and 9,000 Btu/h capacity multiplex condensing, low-temperature systems, TSL 2 involved implementing "efficiency level 4" technology. 79 Fed. Reg. at 32,099, Table V.2 (Equipment Class MC.L.N, TSL 2). However, DOE's own engineering analysis indicates that no 4,000 or 9,000 Btu/h capacity multiplex condensing, low temperature system can reach an AWEF of 6.57 at efficiency level 4. *See* DOE Refrigeration Spreadsheet, Doc. # 0137, "Results Summary" tab, (Analysis Points MC.L.N.006.004.1, MC.L.N.006.009.2, MC.L.N.004.004.1, MC.L.N.004.009.2). The 4,000 and 9,000 Btu/h capacity multiplex condensing, low temperature system analysis points in DOE's mapping table demonstrate this; at efficiency level 4, they only reach AWEFs of 6.26 and 5.94, respectively. Thus, according to DOE's own analysis, 4,000 and 9,000 Btu/h capacity multiplex condensing, low temperature systems will not be able to comply with DOE's TSL 2-based standard using TSL 2 technology. This demonstrates that DOE's selection of a TSL 2 AWEF value of

6.57 is not supported by the evidence before the agency and does not rationally flow from the record, and is therefore arbitrary and capricious. *See State Farm*, 463 U.S. at 43; *Texas Oil & Gas Ass'n v. EPA*, 161 F.3d at 933.

Further, although DOE selected a standard based on TSL 2, according to DOE's own analysis, 4,000 and 9,000 Btu/h capacity multiple condensing, low temperature systems will not be able to comply with the applicable standard of 6.57 using feasible technology. The Energy Policy and Conservation Act ("EPCA") requires DOE to set the WICF standards at the maximum technologically feasible level that is economically justified, 42 U.S.C. § 6313(f)(4)(A) (2012), and precludes promulgation of standards at levels that are not technically feasible. In the WICF Rule, DOE determined that the max-tech level of technology for 4,000 and 9,000 Btu/h capacity multiplex condensing, low temperature systems required under TSL 3 is the same as the technology required by TSL 2. 79 Fed. Reg. at 32,099, Table V.2. According to DOE's own analysis, using this "max-tech" technology will yield the same AWEF as the TSL 2 technology for these multiplex condensing, low-temperature systems - 6.26 for a 4,000 Btu/h capacity system and 5.94 for a 9,000 Btu/h capacity system. Therefore, using the "max-tech" technology will not enable compliance with DOE's 6.57 AWEF standard for these small-capacity multiplex condensing, low temperature systems. This violates EPCA's requirement that the WICF standards

not be set at levels greater than those achievable with "max-tech" technology and constitutes arbitrary and capricious agency action.

Hussmann recognizes that this discussion may appear complex and technical, but DOE cannot hide behind its presumed technical expertise to escape careful judicial review. "Even with regard to complex technical or scientific decisions . . . a reviewing court may not simply defer to an agency's expertise, but must 'steep' itself in technical matters sufficiently to determine whether the agency 'has exercised reasoned discretion.'" *Chem. Mfrs. Ass'n v. EPA*, 870 F.2d 177, 199-200 (5th Cir. 1989) (quoting *Portland Cement Ass'n v. Rckelshaus*, 486 F.2d 375, 402 (D.C. Cir. 1973)), *decision clarified on reh'g*, 885 F.2d 253 (5th Cir. 1989). Judicial review "must be based on something more than trust and faith in [the agency's] experience, and a court may not respond to claims of technical expertise by "rubber stamping" an agency decision as correct." *Id.* Here, DOE's inconsistent and unexplained action is counter to the evidence before DOE and cannot be ascribed to a difference in view or the product of agency expertise, *State Farm*, 463 U.S. at 43, and therefore is arbitrary and capricious.

II. DOE's Engineering Analysis Incorrectly Calculated AWEFs, Improperly Inflating the Multiplex System Standards.

In the WICF Rule, DOE based its AWEF standards for multiplex condensing refrigeration systems on an engineering analysis that measures the efficiency of multiplex condensing systems according to DOE's test procedure.

See TSD, Doc. # 0131 at 5-15. Yet, DOE's engineering analysis failed to accurately determine energy efficiency according to DOE's test procedure because of a key formula error. Therefore, DOE's multiplex system engineering analysis, and the WICF Rule's multiplex system standards based on that engineering analysis, are flawed. Agency action cannot be upheld if based on "a clear error of judgment," *State Farm*, 463 U.S. at 43 (quoting *Bowman Transp. Inc. v. Arkansas-Best Freight Sys.*, 419 U.S. 281 (1974)), and DOE's multiplex condensing refrigeration system standards must be set aside as arbitrary and capricious.

A. DOE's Engineering Analysis Failed to Follow the DOE-Established Test Procedure.

DOE's engineering analysis calculates AWEF for each analysis point/efficiency level combination that underlies DOE's TSLs, using DOE's test procedure for WICFs. *See* TSD, Doc. # 0131 at 5-15 ("Manufacturers must use the test procedure to rate their equipment when certifying compliance with energy conservation standards. Therefore, the energy model attempts to find the rated performance of the equipment as it would be determined by the test procedure, using the same calculations and rating conditions. The model is not designed to capture performance under any conditions other than the rating conditions . . . ."); *id.* at 5-20 ("The energy model for refrigeration systems analytically calculates AWEF using the same methodology as the test procedure."); DOE Refrigeration Spreadsheet, Doc. # 0137, "Calculation" tab (Yellow box stating "[This]

calculation and rating methodology is based on modeling the performance of the system as tested according to the DOE test procedure, AHRI 1250-2009.").

DOE's WICF test procedure incorporates by reference an industry test procedure, AHRI 1250 (I-P)-2009, "2009 Standard for Performance Rating of Walk-In Coolers and Freezers" ("AHRI 1250-2009"), with certain modifications not relevant here. 10 C.F.R. §§ 431.303(b)(1) and 431.304(c)(10) (2014). Under AHRI 1250-2009, AWEF is calculated differently for refrigeration systems with fixed-speed and variable-speed evaporator fans. For multiplex systems with unit coolers with fixed-speed evaporator fans, AWEF is calculated using Equation 123 of AHRI 1250-2009, which uses as an input the variable "LFL," or Load factor during low load period, which in turn is calculated using Equation 122. In contrast, for multiplex systems with unit coolers with variable-speed evaporator fans, the test procedure calculates AWEF using Equation 139 and Equation 140. Equation 140 references the variable "LFL," also Load factor during low load period, but LFL in this equation is calculated under Equation 133.

In DOE's multiplex condensing system engineering analysis underlying its multiplex AWEF standards, DOE incorrectly referenced the "LFL" used for systems with unit coolers with fixed-speed evaporator fans (as derived using Equation 122) in its calculations for systems with unit coolers with variable-speed evaporator fans. *See* DOE Refrigeration Spreadsheet, Doc. # 0137, "Calculation"

tab, Row 361 (cell formulas referencing Row 317, entitled "LFL," which is listed under the heading in Row 315 entitled "Calculations for AWEF-MC Systems with Single-speed fans"). Instead, LFL as derived from Equation 133 should be used for these products in accordance with the test procedure. Because DOE has not done so, DOE's calculation of achievable AWEF for the analysis points underlying DOE's multiplex condensing equipment class standards is flawed. As a result, DOE's determination of AWEF standard levels for multiplex systems, and for unit coolers that are sold separately, which are subject to the multiplex standards, used an incorrect input.

B. DOE's LFL Error Improperly Inflated the AWEF Values on Which DOE Based its Multiplex Standards.

In its engineering analysis, DOE assumed that all multiplex condensing systems using TSL 2 technology used variable-speed evaporator fans.[3] Therefore, all analysis points underlying DOE's TSL 2-based multiplex condensing standards – for both low-temperature and medium temperature systems – are impacted by the "LFL" formula error described above. As shown in Table 2 below, when DOE's error is corrected, the analysis point AWEF values are much lower than those found in DOE's engineering analysis. Because DOE translated TSL 2 into AWEF values that were artificially high for multiplex systems, and subsequently adopted a

[3] *See* DOE Refrigeration Spreadsheet, Doc. # 0137, "Calculation" tab (for any multiplex condensing system analysis point, Row 53 indicates "VEF" – for variable-speed evaporator fan – for the relevant TSL 2 efficiency level).

standard at TSL 2 for multiplex systems, DOE's formula error resulted in minimum AWEF standards that are too high. Once DOE's Engineering Analysis is corrected, DOE's spreadsheet calculations of AWEF for the multiplex system analysis points used to set the final AWEF levels are 8 to 20 percent lower than DOE's original, inaccurate calculations of AWEF.

Table 2: Impact of DOE's LFL Calculation Error

Equipment Class	Nominal Size (Btu/h)	DOE's Calculated TSL 2 AWEF	Correctly Calculated TSL 2 AWEF
Multiplex Condensing, Medium Temperature	4,000	11.26	10.26
	9,000	11.47	10.44
	24,000	10.89	9.97
Multiplex Condensing, Low Temperature	4,000	6.26	5.05
	9,000	5.94	4.84
	18,000	6.83	5.49
	40,000	6.57	5.34

Because DOE relied on AWEF values that were not calculated in accordance with DOE's test procedure in translating TSL 2 into a minimum AWEF standard, DOE has committed legal error in two respects. First, DOE's failure to properly apply its own WICF test procedure in the process of developing WICF standards is, by definition, arbitrary and capricious, because it means DOE has failed to properly apply its stated methodology (and its own regulations). An essential predicate for all EPCA energy efficiency rulemakings is a test procedure that can serve as a common measure of efficiency in the rulemaking and be used for

gauging compliance with the standard after the rulemaking is finished. Here, DOE has misapplied its test procedure in its engineering analysis underlying the WICF Rule, such that a multiplex condensing, medium temperature WICF that DOE estimates would achieve an AWEF of 10.89 in the WICF Rule – *i.e.*, right at compliance with DOE's standard – will only achieve an AWEF of 9.97, and thus will fail to meet the standard when DOE tests the same WICF pursuant to its enforcement regulations. *See* 10 C.F.R. §429.110(e)(1) ("DOE will evaluate whether a basic model complies with the applicable energy conservation standard(s) based on testing conducted in accordance with the applicable test procedures specified in parts 430 and 431"). This misapplication of the test procedure in the WICF Rule is arbitrary and capricious under *State Farm*, and makes DOE's adoption of its multiplex condensing refrigeration system AWEF standards arbitrary and capricious.

Second, because DOE's misapplication of the test procedure in the WICF Rule means that the multiplex refrigeration system AWEF standards are artificially high, those standards also exceed the maximum technologically feasible level. To compensate for DOE's error, manufacturers will be required to implement additional technological measures beyond the TSL 2 level. However, DOE has determined that TSL 2 is the maximum technologically feasible level for refrigeration systems. *See* 79 Fed. Reg. at 32,099, Table V.2 (indicating that the

technology combinations for TSL 2 and TSL 3 are the same). Therefore, it follows from DOE's own analysis that manufacturers would not be able to make compliant multiplex refrigeration systems and would have to stop producing this equipment. Because DOE's error caused DOE to set the multiplex condensing refrigeration system standards at a level that is above maximum technologically feasible level, DOE violated EPCA.

Further, manufacturers did not have an opportunity to provide comments on DOE's misapplication of the test procedure. DOE's error was not present in the WICF Notice of Proposed Rulemaking ("WICF NOPR"), Energy Conservation Program: Energy Conservation Standards for Walk-In Coolers and Freezers, 78 Fed Reg. 55,782 (Sept. 11, 2013), or the underlying Engineering Analysis, NOPR Engineering Analysis Spreadsheet – Refrigeration, Doc. # 0087, and only became known when DOE issued the final rule.

III. DOE Failed to Provide Stakeholders Notice That It Would Consider Hot Gas Defrost in the Final Rule, Thereby Denying the Public An Opportunity to Submit Meaningful Comments.

DOE did not include hot gas defrost as a possible design option for dedicated condensing systems in the WICF NOPR "due to its lack of effectiveness in improving efficiency. . . . Running the compressor to generate hot gas at a time when it would normally be off results in energy use that outweighs the energy saved by using hot gas defrost instead of electric defrost." 78 Fed. Reg. at 55,804.

Although DOE asked for comment on other refrigeration system design options, DOE did not ask for comment on the use of hot gas defrost as a design option for dedicated condensing systems. *See id.* at 55,885 (Question 18, "Refrigeration System Design Options"). Therefore, stakeholders were not on notice that DOE would consider hot gas defrost as a design option for dedicated condensing systems in the Final Rule.

DOE also indicated that there are serious performance and reliability problems with using hot gas defrost in low-temperature refrigeration systems that should cause DOE to reject the use of hot gas defrost as a design option. TSD, Doc. # 0131 at 3-33 (a serious consequence of using hot gas defrost is "cracking and leaking resulting from thermal stresses induced upon the coolant piping due to alternate exposure to high- and low-temperature refrigerant."). DOE failed to develop an adequate record on these problems because it did not request comment on these issues and because the public was not on notice that the hot gas defrost design option was under consideration for dedicated systems. Had Hussmann been given notice of DOE's consideration of hot gas defrost as a design option for dedicated systems, it would have submitted comments further explaining that dedicated condensing hot gas defrost systems do not always function properly in cold climates, suffer from performance issues, and can reduce product lifetime.

"Agency notice must describe the range of alternatives being considered with reasonable specificity; otherwise, interested parties will not know what to comment on." *Owner-Operator Indep. Drivers Ass'n, Inc. v. Fed. Motor Carrier Safety Admin.*, 494 F.3d at 209 (citation and brackets omitted). Notice must be "sufficient to fairly apprise interested parties that [a matter is] still a live issue." *Chem. Mfrs. Ass'n v. EPA*, 870 F.2d 177, 236 (5th Cir.), *decision clarified on reh'g*, 885 F.2d 253 (5th Cir. 1989). With respect to the use of hot gas defrost in dedicated condensing systems, DOE failed to do either of these things, and therefore violated its notice-and-comment obligations to interested parties.

CONCLUSION

WHEREFORE, for the foregoing reasons, Hussmann respectfully requests that the WICF Rule be vacated as it relates to standards for multiplex condensing refrigeration systems and remanded to DOE for further notice-and-comment rulemaking.

Respectfully submitted,

s/ Michael F. McBride

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Dated: April 9, 2015

FORM 6. CERTIFICATE OF COMPLIANCE WITH RULE 32(a)

Pursuant to Fed. R. App. 32(a)(7)(C) and Fifth Circuit Rules 32.1, 32.2, and 32.3, the undersigned counsel of record for Hussmann Corporation, hereby certifies that:

1. This brief complies with the type-volume limitation of Fed. R. App. P. 32(a)(7)(B) because this brief contains 5,120 words, excluding the parts of the brief exempted by Fed. R. App. P. 32(a)(7)(B)(iii).

2. This brief complies with the typeface requirements of Fed. R. App. P. 32(a)(5)(A) because this brief has been prepared in a proportionally spaced typeface using Microsoft Office Word, Version 2010 in 14 point, Times New Roman style.

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CERTIFICATE OF SERVICE

Pursuant to Rule 25(d) of the Federal Rules of Appellate Procedure and Rule 25.2 of the Circuit Rules, I hereby certify that I have on this ninth day of April 2015 served the foregoing documents upon parties in this case through the Court's CM/ECF system or via first-class mail, postage pre-paid for any parties not registered for CM/ECF service.

Dated at Washington, D.C., this 9th day of April 2015.

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