

November 11, 2013

Ms. Brenda Edwards  
U.S. Department of Energy  
Building Technologies Program  
1000 Independence Ave, SW  
Washington, D.C. 20585

**RE: Energy Conservation Standards for Commercial Refrigeration Equipment  
(Docket NO. EERE-2010-BT-STD-0003/RIN 1904-AC19)**

Dear Ms. Edwards:

These comments are submitted by Southern Store Fixtures, Inc. (SSF) in response to the U.S. Department of Energy's (DOE) notice of proposed rulemaking (NOPR) and public meeting appearing in the Federal Register on September 11, 2013. The document pertains to the energy conservation standards for Commercial Refrigeration Equipment (CRE).

Southern Store Fixtures, Inc. is a privately owned small display case manufacturer employing about 200 people and designs and manufactures highly customized and specialized CRE for the Supermarkets and Convenience stores.

This rule making is very important to SSF and believe that significant changes must be made in order to ensure that energy standards are achievable. SSF believes that the impact of this and future DOE standards will have significant negative impact on the operation and the viability of Southern Store Fixtures as an ongoing business.

Annual average self-contained display cases manufactured by SSF is about 45% of the total number of cases manufactured in the past five (5) years and the current NOPR will eliminate about 52% of self-contained display cases manufactured by SSF which is about 25% of our total business.

The following are our specific comments:

### Baseline

We believe that current rulemaking should not have retained the baseline specifications the related technologies that had been used within the engineering analysis associated with the January 2009 final rule.

### Higher Efficiency Lighting

In section 5.6.5.1 of the NIPER's engineering analysis TSD states that "Although LED systems generally have lower absolute efficiency in lumens per watt than fluorescent systems, the fixtures produce light that is more directional in nature. And, while the total lumen output of LED system is lower than fluorescent system, the amount of light incident of product is roughly equivalent."

We do not agree with DOE's assessment on LED systems. Even with the "more directional nature of the light", we have to provide higher wattage LED lights with higher number of diodes to provide similar lumens to fluorescent system in our display cases.

### Higher Efficiency Evaporator Fan Motors

The use of ECM fan motors had already been used in the engineering analysis associated with the January 2009 final rule and introducing it again adds no incremental value to the latest analysis. In order to meet the "Standard Levels for Commercial Refrigeration Equipment" within the January 2009 final rule, we are already using the ECM fan motors.

### Improved Evaporator Coil Design

In section 5.6.5.3 of the NOPR's engineering analysis TSD states that "The high-performance coil uses a combination of enhancements to the heat transfer

surfaces to increase its overall UA-value. These enhancements include higher fin thickness, rifled tubing, and the addition of an extra row of tubes to the coil.”

Similar enhancements were considered in the 2009 final rule and are being used again here in this NOPR.

As the designer and supplier of the coil that was used in the TSD referenced study by Oak ridge National Laboratory, the use of rifled tubing only in a very limited applications may have an insignificant improvement in performance of the coil in a commercial refrigerated display case. While higher fin thickness may improve the coil performance, it has negative impact on air flow and frost formation resulting in degradation in coil performance.

Adding additional rows of tubing will have impact on coil performance, however due to space limitation, this enhancements is not very practical. We have experimented with using smaller diameter tubes in order to have more rows of tube in a fixed available space, while the heat transfer performance was encouraging (8% improvement), the cost associated with the new coil was unacceptable (290% higher than the coil current being used).

#### Improved Insulation

It is not practical to increase the insulation thickness. Changing the thickness requires changing the foaming fixtures. Due to the nature of our manufacturing methods, SSF will need to change couple of molds and one foaming fixture per model and per length and per depth of each case to be able to achieve this change. This requires SSF to modify over 3,000 molds and over 1000 foaming fixtures at an astronomical cost way above the assumed \$2,500,000 cost associated with upgrading insulation fixtures in table 5.6.7 of the engineering analysis. Due to high cost of modification and low number of units per year

manufactured, the sunk fixturing cost (not including the engineering cost) per unit for SSF will be in excess of \$400 per unit.

### Higher Efficiency Condenser Fan Motors

The use of ECM fan motors was considered in the engineering analysis associated with the January 2009 final rule and its use in this NOPR adds no incremental value to the latest analysis.

In order to meet the “Standard Levels for Commercial Refrigeration Equipment” within the January 2009 final rule, we are already using the ECM fan motors in most of the condensing units that are manufactured for use in our self-contained display cases.

### Improved Condenser Coil design

Improved condenser coil designs and/or larger condenser designs will improve the heat transfer performance, however SSF as user of condensing units used in self-contained display cases purchases the catalog condensing units manufactured and sold in the U.S. and do not have much control in the compressor or condenser designs. To have changes made to the condenser on condensing units used in the self-contained display cases, increase in cost of more than \$280 is required which is almost 80% higher than standard catalog condensing unit.

### Higher Efficiency Compressors

Use of higher efficiency compressors with higher EER does have impact on energy usage by the condensing units. However while there has been an improvement in general in the compressor efficiency in the type of compressors used in the compressor racks used for supermarket usage where large hp compressors are used, there has been no improvements in efficiency of smaller (fractional) hp compressors in the small condensing units used in the self-contained cases. As the matter of fact due to use of some new refrigerants and avoiding some noise issues, we have seen a decrease in compressor efficiency compared to units manufactured 5-10 years ago.

The assumption of 5% increase in cost for a 10% improvement in performance is completely invalid and unachievable at this time and near future.

### Night Curtains

While night curtains are available and are currently used in standard and straight display cases, SSF as designer and manufacturer of specialty display cases that have curvatures, have yet to find a manufacturer that offers pull down curtains used that can be used in curved display cases.

As stated in 5.6.5.9, there is a measurable reduction of heat load (39%) during periods when the night curtains were deployed. However surprisingly there are no cost analysis presented for justification of this option.

Studies have shown however while the night curtains reduce the heat load, they are not cost effective.

In the March 2011 study by Pacific Gas and Electric Company titled “Supermarket Refrigeration Codes and Standards Enhancement Initiative”, in appendix A :

Rejected Measures, states that “The feasibility and cost-effectiveness of requiring night covers on all open display cases was evaluated. Air curtains were assumed to reduce infiltration into upright medium-temperature display cases during non-business and non-stocking hours. Analysis showed that the measure was not cost-effective, based on poor TDV economics, particularly when labor to put up and take down the night covers on a daily basis is considered.”

In the Dec 16, 2010 Title 24-Supermarket Meeting, the result of a study funded by California Energy Commission was presented. A minimum 6.63 years and a maximum 21.56 years payback was reported. Due to this long period of payback, California Energy Commission has decided that it will not recommend requiring night curtains to be used on Multi-Deck cases when the new code will go into effect.

Southern Store Fixtures, Inc. appreciates the opportunity to provide these comments. Should you have any questions regarding this submission, please do not hesitate to contact me.

Sincerely,



Massoud Neshan

Vice President

Southern Store Fixtures, Inc.

275 Drexel Road, SE

Bessemer, AL 35022

(205) 428-4800 Phone

(205) 428 7788 Fax

Neshan@southernstorefixtures.com