



May 30, 2022

Dr. Stephanie Johnson
United States Department of Energy
Office of Energy Efficiency and Renewable Energy
Building Technologies Office
EE-2J
1000 Independence Avenue SW
Washington, DC 20585-0121

Submitted electronically via www.reginfo.gov

RE: NAMA Comments to the U.S. Department of Energy on its Notice of Proposed Rulemaking on Test Procedure for Beverage Vending Machines; EERE-2020-BT-TP-0007 Federal Register 18936, Volume 87, No. 62

Dr. Johnson,

The National Automated Merchandising Association (NAMA) appreciates the opportunity to submit the following comments to the U.S. Department of Energy (DOE or Department) on its Notice of Proposed Rulemaking on Test Procedure for Beverage Vending Machines; EERE-2020-BT-TP-0007 Federal Register 18936, Volume 87, No. 62, Thursday, March 31, 2022.

Founded in 1936, NAMA is the association representing the U.S. convenience services industry, with its core membership comprised of owners and operators of vending machines, micro markets, office coffee, tea, water and pantry services, as well as the manufacturers of refrigerated vending machines. With nearly 1,000 member companies – including many of the world’s most recognized brands – NAMA provides advocacy, education and research for its membership. The convenience services industry employs nearly 160,000 Americans – the majority employed by small businesses – contributing a total economic impact of over \$31 billion to the U.S. economy annually.

Regarding the DOE Proposed Rulemaking on the Test Procedure for Beverage Vending Machines (BVM), NAMA is presenting testimony and responses on behalf of the manufacturers of the machines that provide food and beverages to millions of consumers in a safe and environmentally responsible manner.

At the workshop on May 2, 2022, DOE presented information on the proposed revisions to the Test Procedure for BVM and asked several questions. NAMA would like to comment on questions in the published Proposal and several items.

We note that DOE has stated that EPCA requires that...”to determine whether the amended test procedures would more accurately or fully comply with the requirements for the test procedures to *not be unduly burdensome* to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle. (42 U.S.C. 6293 (b)(1)(A). NAMA believes several of the changes discussed and proposed in this NOPR are burdensome and will not assist the Department in ascertaining more accurate energy use of BVMs.

Additionally, at the time of the 2021 RFI, the industry was working to manage during the height of the COVID-19 pandemic. Many member company businesses shut down, and the entire industry was trying to survive daily with factories shuttered, employees working from home, and lack of sales of machines. For over a year, many member companies were not able to conduct design engineering or testing lab operations. Many of the specialists were not available to answer inquiries at that time. We appreciate the Department’s understand that the industry has faced a tumultuous period and are still working to return to pre-pandemic levels.

DOE made the following statement in the NOPR: “DOE has tentatively determined that the proposed amendments described in Section III of this NOPR would not alter the measured efficiency of BVMs or require re-testing or recertification solely as a result of DOE’s adoption of the proposed amendments to the test procedure, if made final.”

“Additionally, DOE has tentatively determined that the proposed amendments, if made final, would not increase the cost of testing.”

While we agree with the Department in some areas, we also disagree with a few of the assumptions in a few critical cases. NAMA will explain why we believe these changes will increase the cost of testing.

NOPR Part III Discussion

A. Scope and Definition

NAMA does not believe that further definition of the terms, “dispense” or “solid partition” are necessary.

B. Updates to Industry Standards

NAMA agrees with DOE that updating the reference to the ANSI/AHAM HRF-1-2008 and ANSI/ASHRAE 32.1-2017 is more appropriate. We note that removal of the requirement to test at both 75 degrees and 90 degrees is appropriate. This would assist the manufacturers in reducing testing costs and would not change the overall energy measurement.

NAMA disagrees with one of the public comments that maintaining provisions for low-power mode testing, not in ASHRAE 32.1-2017, would incentivize manufacturers to incorporate more

energy management controls. This is not the case. NAMA members are constantly improving energy efficiency of BVMs. Manufacturers will use energy management controls when the improvement to efficiency and the cost are appropriate.

NAMA agrees with DOE in referencing ANSI/AHAM HRF-1-2008 which will help to clarify some of the dimensional volume measurements.

C. Test Procedure

1. Ambient Test Conditions

NAMA agrees with DOE that testing at 75 degrees and 45% relative humidity is realistic and provides a reasonable and comparable representation of energy performance.

NAMA is not able to present information about the percentage of machines installed indoors, outdoors, in insulated environments, or in space-conditioned indoor environments. We hope the Department understands that BVM manufacturers do not determine placement of machines. The customer of the BVM manufacturer and their individual bottler or store location makes that determination and information is not shared with the BVM producer.

2. Test Procedure for Combination BVMs

NAMA members acknowledge that many machines are configured for both “snacks” and for beverages. We also agree that testing or designing a “standard” thermal mass for testing non-beverage items is very difficult and would not create any better information than what DOE has proposed. We support the conclusion that estimating the thermal characteristics by using no-filled space for non-beverage materials is best. The method proposed by the Department is a representative, reasonable, and reproducible approach.

Please note again that the manufacturers of BVM do not dictate what non-beverage materials are placed into the machines. The BVM manufacturers do not have information on this and would not be able to provide this to DOE.

3. Characteristics of the Standard Product

NAMA agrees with the Department that BVM combination machines do not have a solid partition between beverages and food (i.e., snack) items. As DOE stated, the BVM manufacturers do not always (we would add, rarely) specify the packaging and contents of the merchandise to be loaded. This is the decision of the machine owner or the store franchise location. NAMA also agrees that it would be very difficult to design a uniform non-beverage food material for testing. We agree that the non-beverage areas should be left empty for testing.

NAMA members are very aware of and very concerned about testing loads for beverage containers to be representative of the thermal characteristics.

DOE also requested information on whether the “standard products” defined in Appendix B require any further specifications. DOE asked whether the contents of the test containers, the 33% propylene glycol and 67% water solution should be further clarified as to whether based on weight or volume. We would point out that other ASHRAE standards use the percentage propylene glycol and water by **volume**, not by weight. See ASHRAE 72 as an example. We believe measurement by volume should be stated in the test procedure, for consistency.

NAMA believes that specifying an alternative propylene glycol solution for testing BVMs is not likely to reduce test variability as might be the case when testing materials are at or below freezing. Further clarification is not necessary.

4. Lowest Applicable Product Temperature

Section 2.1.1 of Appendix B requires that the integrated average temperature (IAT) of the BVM be 36 deg F +/- 1 deg F over the test period. For BVMs only capable of operating at temperatures higher than the specified IAT of 36 deg F, section 2.1.3 requires testing at the BVMs lowest application product temperature (LAPT).

DOE has proposed maintaining the current LAPT provisions and adding an additional provision for testing BVMs that are only capable of maintaining temperatures below the 36 deg F range. For these units, DOE proposed to test at the highest thermostat setting. This would allow for testing the BVM under the setting closest to the required IAT.

NAMA agrees with the Department in this proposal.

5. Payment Mechanisms

This area is one that causes the most difficulties for NAMA members. We also note that we believe after reading this section many times and listening to the Webinar, that we still do not fully understand what DOE is proposing.

DOE has made statements about the projected percentage of BVM shipped with payment systems. The statements suggest DOE believes all or nearly all machines are shipped with a payment system included.

This is a much more complicated issue than a simple answer of a universal percentage. Within the industry, our survey shows the percentage of machines shipped with payment systems ranges from 5 to 98%. Some manufacturers ship 80-98% with a payment system according to the platforms. Other manufacturers do far less, allowing the customer of the manufacturers to add a payment system later.

In the current energy reporting method, the issue of payment system energy is already included. The proposed test procedure suggests that all payment systems during the test be disabled and a factor of 0.2 kWh per day be added in the report, *where possible*. The question we have been asked is whether 0.2 kWh/day is accurate.

In the Proposed 2022 Test Procedure, DOE has asserted that coin and bill payment systems are typically included with BVM as shipped. The statement made is that requiring the payment mechanism to be energized during testing would provide a more accurate measurement of the energy used, rather than the default factor applied. DOE has indicated that it may consider amending the test procedure to require that if the BVM is shipped with coin or bill payment mechanisms in place, the payment systems should be energized during tests. Regarding credit card systems, DOE has indicated it would maintain the current method in which the reader would be de-energized if possible or set to the lowest energy state.

However, the BVM manufacturer does not design the machine to meet the DOE test procedure but rather to meet the specifications of the customer.

DOE is considering proposing to maintain the 0.20 kWh/day factor to the energy used to account for machines in which no payment mechanism is shipped with the machine.

The problem with this approach is that there are multiple coin, bill and credit card readers for each model of each machine. For machines shipped with a payment system, this would require creating a matrix of multiple machine types to be tested with multiple payment types by multiple manufacturers of the payment systems. In addition, new technologies are occurring on the market all the time. For examples, many machines must incorporate cell phone payment, credit card chip pass-by systems, and telemetry systems which link to a business internal accounting. The customer dictates these. BVM manufacturers may not know the next system coming to them for insertion a year or two from now. This is a very fluid situation. In addition, manufacturers often receive a new payment system from a customer right before production. According to this new method, production of the BVM would have to be put on hold until energy testing is completed. This is very unfair to the BVM manufacturer and to the customer.

Testing these multiple combinations is onerous. While NAMA would agree that using an automatic 0.20 kWh/day factor may not be the most accurate in all cases, we believe that the present circumstance is better than requiring hundreds of hours of testing in the laboratories for the sake of a fraction of a kWh per day difference. DOE's survey for even bill reading equipment shows that the average is 0.11 kWh/day and a range of 0.04-0.17 kWh/day. If DOE insists on pursuing this, we would be happy to work with the Department to approximate a new factor for the next edition of a test procedure, but we question the time and human energy spent on this.

NAMA strongly urges the Department not to require every machine model be tested with every combination of a payment method. We believe the energy use factor of 0.20 kWh per day should be used for all BVMs.

Furthermore, DOE has stated that it has tentatively determined manufacturers would not be required to re-test or re-certify BVMs because of the proposed payment mechanism approach until the new Energy Efficiency Standard is effective. We do not understand this statement. Manufacturers are required under law to make representations, including filings to the Department which are based on actual testing. While it may be the case with the proposal that this would not have to take place before the new Standard Level is effective, manufacturers would have to engage in considerable testing before and certainly after the new testing becomes effective. This only delays the inevitable large amount of additional testing; it does not eliminate the testing. And, with every new technology, BVM manufacturers would have to continue to generate a huge matrix of test data in the years in the future. All of this seems unnecessary when we are discussing the difference of 0.003 kWh/day.

6. Low Power Modes

At this time, NAMA is not prepared to comment on the energy benefits of “learning-based” energy management controls. This is a new and changing field and we suggest DOE not engage in this investigation at this time. As even the advocate groups NEEA and NPCC mentioned, the technologies are still unknown. And yes, the impacts of any learning-based controls would vary greatly on the specific field installation and usage scenarios, many of which are set by the end user, not the BVM manufacturer.

NAMA agrees with DOE’s conclusion that we do not account for “learning-based” controls in the test procedure at this time.

6a. Accessory Low Power Mode

NAMA agrees with the Department’s conclusion not to change the accessory low power mode testing at this time.

We also agree with the Department that BVMs may be used in a variety of locations and the actual duration of the low-power accessory mode will be based on the installation location as well as the choice of the ultimate customer/user. The BVM manufacturer may not have either control over this period or the environment. This is the choice of the customer.

We believe it is better to establish a clear, reasonable, and reproducible method than it is to measure something which is so highly variable. The current method works.

6b. Refrigeration Low Power Mode

In the 2021 RFI, DOE asked for comments on whether any amendments are needed to the definition of refrigeration low power mode.

NAMA does not believe any amendments are necessary.

DOE also asked for comments on whether any other BVM operating modes should be considered a refrigeration low power mode but cannot meet the current definition or validation test method.

NAMA is not aware of any other refrigeration low power mode that cannot meet the definition or validate the test method.

DOE also asked if a physical test to account for low power mode is feasible and the burden associated. NAMA believes that a physical test is not necessary and that any such test would be a significant burden to the manufacturers. There are many such low power modes for refrigeration and are based on the use by the end customer, not necessarily by the BVM manufacturer.

We note that some of the commenters stated that the 3-percent credit might be inhibiting to technology. NAMA members do not agree with this assessment.

NAMA agrees with the Department that the challenges of implementing a refrigeration low power mode test remain the same as in 2015. These low power modes are often set by the end customer and not the purview of the BVM manufacturer. NAMA agrees that the current 3-percent credit is sufficient and as accurate as possible at this time. NAMA also agrees with the 6-hour test time period for accessory low power mode.

Again, NAMA represents the manufacturers of the BVM. The manufacturers are not the owners of the equipment in the field and often have no contact with the machines once placed in the field. From what little information we have, we believe that the 3-percent credit and the 6-hour low power mode test period are reasonable and approximate the current status.

7. Reloading and Recovery Periods

NAMA recognizes that the current appendix B does not contain a temperature recovery period. While again, machine manufacturers do not have daily contact with machines once in the field, but from what we can tell, the BVM restocking does not represent significant change in the yearly energy consumption. We agree with the comment from DOE that restocking appears to be relatively infrequent, on the order of once a week.

We agree with the Department on both items that an additional test for these characteristics is not needed or reasonable.

8. Alternate Refrigerants

In 2021, DOE requested information on additional equipment or controls manufacturers might need to protect from a leak situation. In 2021, NAMA was engaged with Oak Ridge National Laboratories (ORNL) and the Department of Energy in a Cooperative Research and Development Agreement (CRADA) which is behind schedule, largely due to COVID-19. The COVID-19 Pandemic caused many delays in the CRADA (originally scheduled to be from 2019 to 2021). The staff at ORNL were shut out of the labs for many months. Testing was not only delayed but greatly diminished. The interim report issued end of 2021 shows that an increase in ventilation is very helpful in reducing the concentration should a leak in the refrigerant system occur. The new refrigerants are ASHRAE 34 Class A-3. These refrigerants are considered flammable. The chances of a leak from the refrigerant system are very remote. However, BVM manufacturers must explore and take steps to reduce the risk. This type of equipment might need to be energized in some circumstances to move air all the time, in addition to controls which could energize the ventilation equipment when a leak is discovered. To date, a specific, accurate, reliable refrigerant sensor is not available. In the continuation of the CRADA in 2022, we are considering other means of sensing a leak.

NAMA believes that the use of additional ventilation whether all the time or in cases of a leak scenario are important for product safety and for the consumer safety. We believe that at this time, we do not know exactly what these mechanisms might be. However, we do believe that DOE should not impede creativity of technology options by assessing an “energy penalty” to the BVM manufacturers when the manufacturers deem it necessary to use such safety components. We urge DOE to not include the energy use of these safety measures particularly not before we have the results of the current CRADA. It is highly unlikely that if there are leak mitigation components used, that they would be customer controlled. At this time, it is too early to predict what leak mitigation controls might be used.

We also point out that NAMA members have been working for more than 5 years to adopt new lower GWP refrigerants. We understand that the Department and other branches of the U.S. Government are encouraging the use of low GWP refrigerants. We are asking that all measures under the DOE test procedure not increase the time to adopt these refrigerants.

9. Connected Functions

DOE requested information on the use of connected functions and the energy impact of these functions. NAMA does not have additional information on this issue at this time. Our industry is in the early phase of investigating these functions and hope to have additional

information in future years.

10. Condenser Conditions

We note the comments of CoilPod. We note that CoilPod suggested the BVM owners account for lack of coil cleaning by accounting for changes in energy usage. We need to reiterate that the BVM manufactures conduct the testing for DOE adherence but do not own the machines once they are placed in a retail landscape and have no ability to control whether cleaning is accomplished or not. Even if the machine came back to the manufacturer for repair, energy testing is not performed. We are not aware of other electrical appliances under EPAC or EPCA that need to account for changes in energy use if maintenance is not performed.

D. Test Procedure Costs and Impact

We appreciate that most of the items included in this Test Procedure proposal document may not appreciably change the energy use of the BVM machines. However, we disagree strongly with the comments of DOE on the cost of testing for different payment mechanisms. The cost is much higher than the \$8,300 per basic model. In addition, each time the manufacturer would seek to make a change that in any way affects the energy use of the machine, this would necessitate the entire matrix of tests with every possible combination of payment mechanisms. In addition, if there are substantive changes to the energy (i.e., new compressor, new condenser, new evaporator) this would necessitate a complete review by the safety certification organization. The cost of such a re-test of a machine by a safety certification organization will be more far more than the estimate given and could take 3 months or more. DOE and the contractors did not include the safety re-certification in the cost of testing.

In Conclusion

NAMA wishes to thank the Department for its work to review this proposed test procedure. We believe many of the conclusions from the Department are accurate and appropriate. We only ask that DOE consider our particular remarks on the Payment Systems and Alternate Refrigerants.

We also would point out that NAMA agrees in principle with having tests for energy use and energy efficiency, when appropriate, when necessary, and when limited in scope. Many of the commenters represent organizations that do not have to spend hundreds of person-hours every week conducting tests or incur the cost of using outside laboratories. While it is easy for them to comment in favor of additional tests, the fact is that these additional tests will not bring more overall accuracy but instead overall additional costs as this manufacturing segment is just beginning to recover from an enormous period of economic downturn due to the COVID-19 pandemic.

We appreciate that the Department, in many cases, has acknowledged that more and more testing is not warranted. In a few cases where the Department has suggested additional testing mentioned above, this will require expensive additional tests, and that DOE consider the full cost of these test procedure changes.

Again, NAMA appreciates the opportunity to comment on this important proposed rulemaking.

Sincerely,

A handwritten signature in blue ink, appearing to read "Michael Goscinski". The signature is fluid and cursive, with a prominent loop at the end.

Michael Goscinski
Senior Director, External Affairs
NAMA