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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

DEPARTMENT OF ENERGY

10 CFR Part 431

[EERE–2019–BT–STD–0018]

Energy Conservation Program: Energy Conservation Standards for Distribution Transformers

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

ACTION: Request for information.

SUMMARY: The U.S. Department of Energy (''DOE'') is initiating an effort to determine whether to amend the current energy conservation standards for distribution transformers. Under the Energy Policy and Conservation Act of 1975, as amended, DOE must review these standards at least once every six years and publish either a notice of proposed rulemaking (''NOPR'') to propose new standards for distribution transformers or a notice of determination that the existing standards do not need to be amended. This request for information (''RFI'') solicits information from the public to help DOE determine whether amended standards for distribution transformers would result in significant energy savings and whether such standards would be technologically feasible and economically justified. DOE welcomes written comments from the public on any subject within the scope of this document (including topics not raised in this RFI).

DATES: Written comments and information are requested and will be accepted on or before August 2, 2019.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *http://www.regulations.gov.* Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2019–BT–STD–0018, by any of the following methods:

1. *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the instructions for submitting comments.
2. *Email: DistributionTransformers2019STD0018@ee.doe.gov.* Include the docket number EERE–2019–BT–STD–0018 in the subject line of the message.
3. *Postal Mail:* Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, Mailstop EE–5B, 1000 Independence Avenue SW, Washington, DC 20585–0121. Telephone: (202) 287–1445. If possible, please submit all items on a compact disc (''CD''), in which case it is not necessary to include printed copies.
4. *Hand Delivery/Courier:* Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza SW, 6th Floor, Washington, DC 20024. Telephone: (202) 287–1445. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

No telefacsimilies (faxes) will be accepted. For detailed instructions on submitting comments and additional information on this process, see section III of this document.

Docket: The docket for this activity, which includes **Federal Register** notices, comments, and other supporting documents/materials, is available for review at *http://www.regulations.gov.* All documents in the docket are listed in the *http://www.regulations.gov* index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket web page can be found at *http://www.regulations.gov/#docketDetail;D=EERE-2019-BT-STD-0018.* The docket web page contains instructions on how to access all documents, including public comments, in the docket. See section III for information on how to submit comments through *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT:

Mr. Jeremy Dommu, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE–5B, 1000 Independence Avenue SW, Washington, DC 20585–0121. Telephone: (202) 586–9870. Email: *ApplianceStandardsQuestions@ee.doe.gov.*

Ms. Sarah Butler, U.S. Department of Energy, Office of the General Counsel, GC–33, 1000 Independence Avenue SW, Washington, DC 20585–0121. Telephone: (202) 586–1777. Email: *sarah.butler@hq.doe.gov.*

For further information on how to submit a comment or review other public comments and the docket contact the Appliance and Equipment Standards Program staff at (202) 287–1445 or by email: *ApplianceStandardsQuestions@ee.doe.gov.*

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I. Introduction

A. Authority and Background

The Energy Policy and Conservation Act of 1975, as amended (''EPCA''),[1] among other things, authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part C[2] of EPCA, added by Public Law 95–619, Title IV, section 441(a), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. This equipment includes distribution transformers, the subject of this RFI. Congress directed DOE to prescribe energy conservation standards for such equipment. (42 U.S.C. 6317(a)(2)) Congress also established energy conservation standards for low-voltage dry-type distribution transformers. (42 U.S.C. 6295(y))

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6311), energy conservation standards (42 U.S.C. 6313), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), and the authority to require information and reports from manufacturers (42 U.S.C. 6316). Federal energy efficiency requirements for covered equipment established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6316(a) and (b); 42 U.S.C. 6297)

On October 12, 2007, DOE established energy conservation standards for liquid-immersed distribution transformers and medium-voltage, dry-type (MVDT) distribution transformers. 72 FR 58190. The Energy Policy Act of 2005 (Pub. L. 109–58, EPACT 2005) amended EPCA to establish energy conservation standards for low-voltage dry-type (LVDT) distribution transformers.[3] [4] (42 U.S.C. 6295(y)) On April 18, 2013, DOE amended the energy conservation standards for liquid-immersed, MVDT, and LVDT distribution transformers.[5] 78 FR 23335 (''April 2013 standards rule'').

The amended energy conservation standards in the April 2013 standards rule were informed by a series of negotiated rulemaking sessions. DOE established subcommittees under DOE's Energy Efficiency and Renewable Energy Advisory Committee (ERAC), in accordance with the Federal Advisory Committee Act and the Negotiated Rulemaking Act, to negotiate proposed standards for the energy efficiency of MVDT and liquid-immersed distribution transformers, and LVDT distribution transformers, separately. 76 FR 45471 (July 29, 2011); 76 FR 50148 (August 12, 2011). The ERAC subcommittees consisted of representatives of parties with a defined stake in the outcome of the energy conservation standards. The ERAC subcommittee held multiple meetings to negotiate the energy conservation standards, wherein DOE presented both draft and revised engineering, life-cycle cost and national impact analyses and results, based on input from subcommittee members on a number of topics. The resulting April 2013 standards rule was informed by the content of the negotiation sessions. The negotiating committee reached an outright consensus regarding energy conservation standards for MVDT distribution transformers but not for liquid-immersed or LVDT distribution transformers. 78 FR 23346–22347.

The current energy conservation standards are located in 10 CFR 431.196. The currently applicable DOE test procedures for distribution transformers appear at 10 CFR part 431, subpart K, appendix A.

EPCA also requires that, not later than 6 years after the issuance of any final rule establishing or amending a standard, DOE must evaluate the energy conservation standards for each type of covered equipment, including those at issue here, and publish either a notice of determination that the standards do not need to be amended based on the criteria established under 42 U.S.C. 6295(n)(2), or a NOPR including new proposed energy conservation standards based on the criteria at 42 U.S.C. 6295(o). (42 U.S.C. 6316(a); 42 U.S.C. 6295(m)(1))

If DOE determines not to amend a standard based on the statutory criteria, not later than 3 years after the issuance of a final determination not to amend standards, DOE must publish either a new determination that standards for the product do not need to be amended, or a NOPR including new proposed energy conservation standards. (42 U.S.C. 6316(a); 42 U.S.C. 6295(m)(3)(B)) If DOE decides to amend the standard based on the statutory criteria, DOE must publish a final rule not later than two years after energy conservation standards are proposed. (42 U.S.C. 6316(a); 42 U.S.C. 6295(m)(3)(A))

DOE must publicize its analysis and determination to not amend standards or to propose standards and provide an opportunity for written comment. (42 U.S.C. 6316(a); 42 U.S.C. 6295(m)(2)) In making either determination, DOE must evaluate whether more stringent standards would (1) result in significant conservation of energy and (2) be both technologically feasible and economically justified. (42 U.S.C. 6316(a); 42 U.S.C. 6295(m)(1)(A)).

DOE is publishing this RFI to collect data and information to inform its decision consistent with its obligations under EPCA.

B. Rulemaking Process

DOE must follow specific statutory criteria for prescribing new or amended standards for covered equipment. EPCA requires that any new or amended energy conservation standard be designed to achieve the maximum improvement in energy or water efficiency that is technologically feasible and economically justified. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(2)(A)) To determine whether a standard is economically justified, EPCA requires that DOE determine whether the benefits of the standard exceed its burdens by considering, to the greatest extent practicable, the following seven factors:

(1) The economic impact of the standard on the manufacturers and consumers of the affected products;

(2) The savings in operating costs throughout the estimated average life of the product compared to any increases in the initial cost, or maintenance expenses;

(3) The total projected amount of energy and water (if applicable) savings

[1] All references to EPCA in this document refer to the statute as amended through America's Water Infrastructure Act of 2018, Public Law 115–270 (October 23, 2018).

[2] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A–1.

[3] EPACT 2005 established that the efficiency of a low-voltage dry-type distribution transformer manufactured on or after January 1, 2007 shall be the Class I Efficiency Levels for distribution transformers specified in Table 4–2 of the ''Guide for Determining Energy Efficiency for Distribution Transformers'' published by the National Electrical Manufacturers Association (NEMA TP 1–2002).

[4] Although certain provisions pertaining to distribution transformers, including test procedures and standards for LVDT distribution transformers, have been established in the part of EPCA generally applicable to consumer products (See, 42 U.S.C. 6291(35), 6293(b)(10), 6295(y)), they are commercial equipment. Accordingly, DOE has established the regulatory requirements for distribution transformers, including LVDT distribution transformers, in 10 CFR part 431, Energy Efficiency Program for Certain Commercial and Industrial Equipment. See, 70 FR 60407 (October 18, 2005).

[5] The Technical Support Document for the April 2013 standards rule is available at the following: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

likely to result directly from the standard;

(4) Any lessening of the utility or the performance of the products likely to result from the standard;

(5) The impact of any lessening of competition, as determined in writing by the Attorney General, that is likely to result from the standard;

(6) The need for national energy and water conservation; and

(7) Other factors the Secretary of Energy (Secretary) considers relevant. (42 U.S.C. 6316(a); 42 U.S.C. 6295(o)(2)(B)(i)(I)–() thrVII)).

DOE fulfills these and other applicable requirements by conducting a series of analyses throughout the rulemaking process. Table I.1 shows the individual analyses that are performed to satisfy each of the requirements within EPCA.

TABLE I.1— EPCA REQUIREMENTS AND CORRESPONDING DOE ANALYSIS

EPCA requirement	Corresponding DOE analysis
Technological feasibility	• Market and Technology Assessment. • Screening Analysis. • Engineering Analysis.
Economic Justification:	
1. Economic impact on manufacturers and consumers	• Manufacturer Impact Analysis. • Life-Cycle Cost and Payback Period Analysis. • Life-Cycle Cost Subgroup Analysis. • Shipments Analysis.
2. Lifetime operating cost savings compared to increased cost for the product.	• Markups for Product Price Determination. • Energy and Water Use Determination. • Life-Cycle Cost and Payback Period Analysis.
3. Total projected energy savings	• Shipments Analysis. • National Impact Analysis.
4. Impact on utility or performance	• Screening Analysis. • Engineering Analysis.
5. Impact of any lessening of competition	• Manufacturer Impact Analysis.
6. Need for national energy and water conservation	• Shipments Analysis. • National Impact Analysis.
7. Other factors the Secretary considers relevant	• Employment Impact Analysis. • Utility Impact Analysis. • Emissions Analysis. • Monetization of Emission Reductions Benefits. • Regulatory Impact Analysis.

As detailed throughout this RFI, DOE is publishing this document seeking input and data from interested parties to aid in the development of the technical analyses on which DOE will ultimately rely to determine whether (and if so, how) to amend the standards for distribution transformers.

C. Summary of the Impacts of the Amorphous Steel Market on the Current Standards for Liquid-Immersed Distribution Transformers

In the April 2013 standards rule, DOE set energy conservation standards for liquid-immersed distribution transformers, LVDT distribution transformers, and MVDT distribution transformers. 75 FR 23338. In its analyses of liquid-immersed distribution transformers, DOE considered seven sets of energy efficiency levels, referred to as trial standard levels (''TSL''). The levels represent increasingly stringent levels of energy conservation standards, numbered from TSL 1, the least stringent, to TSL 7, the most stringent. 78 FR 23397. DOE adopted TSL 1 energy conservation levels for liquid-immersed distribution transformers. DOE did not adopt energy efficiency levels more stringent than TSL 1 in part because of risks associated with limitations in the available supply of amorphous steel. At more stringent required standard levels DOE determined it likely that the market would transition entirely to the use of amorphous steel. 78 FR 23415–23418. DOE was concerned that if this were the case, there might not have been a sufficient supply of amorphous steel to meet manufacturers' needs. *Id.*

DOE determined that the burden of the risk that manufacturers would not be able to obtain the quantities of amorphous steel required to meet the higher efficiency requirement levels outweighed the benefits of adopting these efficiency levels. *Id.* This determination contributed to DOE's decision that the higher efficiency requirement levels were not economically justified. *Id.* Additionally, DOE acknowledged that although the industry could manufacture liquid-immersed distribution transformers at TSL 2 and TSL 3 from steels other than amorphous steel, amorphous steel was the cheapest design option for at least some of the transformer designs that were analyzed at these levels. 78 FR 23417–23418. In the analysis that led up to the April 2013 standards rule, DOE identified only one supplier that produced amorphous steel in any significant volume. DOE expressed concern that this one supplier, together with others that might enter the market, would not be able to increase production of amorphous steel rapidly enough to supply the amounts that would be needed by transformer manufactures before the compliance date of January 1, 2016, if any energy efficiency levels higher than TSL 1 were adopted. 78 FR 23414–23421

D. Summary of the Impacts of the Steel Market on the Current Standards for Low-Voltage Dry-Type Distribution Transformers

In its analyses of low-voltage dry-type distribution transformers for the April 2013 standards rule, DOE considered six sets of trial standard levels with increasingly stringent levels of energy conservation standards and adopted TSL 2 energy conservation levels. 78 FR 23337. DOE did not adopt energy efficiency levels more stringent than TSL 2 for low-voltage dry-type distribution transformers in part because of risks associated with limitations in the available supply and quality of M4, M3, and amorphous steels.[6] 78 FR 23421. If DOE required more stringent levels of energy conservation in low-voltage dry-type distribution transformers, manufacturers of the transformers might have had to rely on M4, M3, or amorphous steels to meet those conservation standards. *Id.*

DOE was concerned that if the next most stringent energy conservation levels were adopted (TSL 3), then a significant number of small manufacturers would be unable to acquire the M4, M3 or higher quality steels in sufficient supply and quality to be able to compete. *Id.* DOE indicated that this risk to small manufacturers outweighed the benefits of adopting TSL 3 efficiency levels. *Id.* Additionally, DOE was concerned that small manufacturers might not be able to procure sufficient amounts of amorphous steel at competitive prices, if at all, if energy conservation levels TSL 4, TSL 5, or TSL 6 were adopted. *Id.* DOE indicated that the benefits of energy conservation levels TSL 4 through TSL 6 would be outweighed in part by this potential burden on manufacturers. These determinations contributed to DOE's decision that efficiency requirement levels higher than TSL 2 were not economically justified. 78 FR 23419–23421.

II. Request for Information and Comments

In the following sections, DOE has identified a variety of issues on which it seeks input to aid in the development of the technical and economic analyses regarding whether amended standards for distribution transformers may be warranted. Additionally, DOE welcomes comments on other issues relevant to the conduct of this rulemaking that may not specifically be identified in this document. In particular, DOE notes that under Executive Order 13771, ''Reducing Regulation and Controlling Regulatory Costs,'' Executive Branch agencies such as DOE are directed to manage the costs associated with the imposition of expenditures required to comply with Federal regulations. See 82 FR 9339 (Feb. 3, 2017). Consistent with that Executive Order, DOE encourages the public to provide input on measures DOE could take to lower the cost of its energy conservation standards rulemakings, recordkeeping and reporting requirements, and compliance and certification requirements applicable to distribution transformers while remaining consistent with the requirements of EPCA.

A. Equipment Covered by This Process

This RFI covers equipment that meets the definitions of distribution transformers, as codified at 10 CFR 431.192. The definitions for distribution transformers were most recently amended in an energy conservation standards final rule. 78 FR 23433. The current definition for a distribution transformer codified in 10 CFR 431.192 is the following:

Distribution transformer means a transformer that—

(1) Has an input voltage of 34.5 kV or less;

(2) Has an output voltage of 600 V or less;

(3) Is rated for operation at a frequency of 60 Hz; and

(4) Has a capacity of 10 kVA to 2500 kVA for liquid-immersed units and 15 kVA to 2500 kVA for dry-type units; but

(5) The term ''distribution transformer'' does not include a transformer that is an—

(i) Autotransformer; (ii) Drive (isolation) transformer; (iii) Grounding transformer; (iv) Machine-tool (control) transformer; (v) Nonventilated transformer; (vi) Rectifier transformer; (vii) Regulating transformer; (viii) Sealed transformer; (ix) Special-impedance transformer; (x) Testing transformer; (xi) Transformer with tap range of 20 percent or more; (xii) Uninterruptible power supply transformer; or (xiii) Welding transformer.

DOE notes that the excluded equipment listed above is specifically excluded from energy conservation standards under EPCA at 42 U.S.C. 6291(35)(B)(ii)). Definitions for these terms are at 10 CFR 431.192 as follows:

Autotransformer means a transformer that:

(1) Has one physical winding that consists of a series winding part and a common winding part;

(2) Has no isolation between its primary and secondary circuits; and

(3) During step-down operation, has a primary voltage that is equal to the total of the series and common winding voltages, and a secondary voltage that is equal to the common winding voltage.

Drive (isolation) transformer means a transformer that:

(1) Isolates an electric motor from the line;

(2) Accommodates the added loads of drive-created harmonics; and

(3) Is designed to withstand the additional mechanical stresses resulting from an alternating current adjustable frequency motor drive or a direct current motor drive.

Grounding transformer means a three-phase transformer intended primarily to provide a neutral point for system-grounding purposes, either by means of:

(1) A grounded wye primary winding and a delta secondary winding; or

(2) A transformer with its primary winding in a zig-zag winding arrangement, and with no secondary winding.

Liquid-immersed distribution transformer means a distribution transformer in which the core and coil assembly is immersed in an insulating liquid.

Machine-tool (control) transformer means a transformer that is equipped with a fuse or other over-current protection device, and is generally used for the operation of a solenoid, contactor, relay, portable tool, or localized lighting

Medium-voltage dry-type distribution transformer means a distribution transformer in which the core and coil assembly is immersed in a gaseous or dry-compound insulating medium, and which has a rated primary voltage between 601 V and 34.5 kV.

Mining distribution transformer means a medium-voltage dry-type distribution transformer that is built only for installation in an underground mine or surface mine, inside equipment for use in an underground mine or surface mine, on-board equipment for use in an underground mine or surface mine, or for equipment used for digging, drilling, or tunneling underground or above ground, and that has a nameplate which identifies the transformer as being for this use only.

Nonventilated transformer means a transformer constructed so as to prevent external air circulation through the coils of the transformer while operating at zero gauge pressure.

Rectifier transformer means a transformer that operates at the fundamental frequency of an alternating-current system and that is designed to have one or more output windings connected to a rectifier.

Regulating transformer means a transformer that varies the voltage, the phase angle, or both voltage and phase angle, of an output circuit and compensates for fluctuation of load and input voltage, phase angle or both voltage and phase angle.

Sealed transformer means a *transformer* designed to remain hermetically sealed under specified conditions of temperature and pressure.

Special-impedance transformer means any *transformer* built to operate at an impedance outside of the normal

[6] These steels are among the most common grades used in manufacture of distribution transformers. M3 and M4 are examples of ''conventional'' grain-oriented electrical steel, whereas amorphous is the lowest-loss grade and a practical necessity to reach the very highest efficiency levels.

impedance range for that *transformer*'s kVA *rating.* The normal impedance range for each kVA rating for liquid-immersed and dry-type *transformers* is shown in Table II.1 and Table II.2 of this document, respectively.

TABLE II.1—NORMAL IMPEDANCE RANGES FOR LIQUID-IMMERSED DISTRIBUTION TRANSFORMERS

Single-phase transformers		Three-phase transformers	
kVA	Impedance (%)	kVA	Impedance (%)
10	1.0–4.5	15	1.0–4.5
15	1.0–4.5	30	1.0–4.5
25	1.0–4.5	45	1.0–4.5
37.5	1.0–4.5	75	1.0–5.0
50	1.5–4.5	112.5	1.2–6.0
75	1.5–4.5	150	1.2–6.0
100	1.5–4.5	225	1.2–6.0
167	1.5–4.5	300	1.2–6.0
250	1.5–6.0	500	1.5–7.0
333	1.5–6.0	750	5.0–7.5
500	1.5–7.0	1,000	5.0–7.5
667	5.0–7.5	1,500	5.0–7.5
833	5.0–7.5	2,000	5.0–7.5
		2,500	5.0–7.5

TABLE II.2—NORMAL IMPEDANCE RANGES FOR DRY-TYPE DISTRIBUTION TRANSFORMERS

Single-phase transformers		Three-phase transformers	
kVA	Impedance (%)	kVA	Impedance (%)
15	1.5–6.0	15	1.5–6.0
25	1.5–6.0	30	1.5–6.0
37.5	1.5–6.0	45	1.5–6.0
50	1.5–6.0	75	1.5–6.0
75	2.0–7.0	112.5	1.5–6.0
100	2.0–7.0	150	1.5–6.0
167	2.5–8.0	225	3.0–7.0
250	3.5–8.0	300	3.0–7.0
333	3.5–8.0	500	4.5–8.0
500	3.5–8.0	750	5.0–8.0
667	5.0–8.0	1,000	5.0–8.0
833	5.0–8.0	1,500	5.0–8.0
		2,000	5.0–8.0
		2,500	5.0–8.0

Testing transformer means a transformer used in a circuit to produce a specific voltage or current for the purpose of testing electrical equipment.

Transformer means a device consisting of 2 or more coils of insulated wire that transfers alternating current by electromagnetic induction from 1 coil to another to change the original voltage or current value.

Transformer with tap range of 20 percent or more means a transformer with multiple voltage taps, the highest of which equals at least 20 percent more than the lowest, computed based on the sum of the deviations of the voltages of these taps from the transformer's nominal voltage.

Uninterruptible power supply transformer means a transformer that is used within an uninterruptible power system, which in turn supplies power to loads that are sensitive to power failure, power sags, over voltage, switching transients, line noise, and other power quality factors.

Welding transformer means a transformer designed for use in arc welding equipment or resistance welding equipment.

Issue A.1: DOE requests comment on whether the definitions for distribution transformers require any revisions—and if so, how those definitions should be revised. In particular, DOE requests feedback regarding how closely the kVA and voltage limits mirror those of equipment generally considered to serve in a power distribution capacity. DOE also requests feedback on whether the sub-category definitions currently in place are appropriate or whether further modifications are needed. If these sub-category definitions need modifying, DOE seeks specific input on how to define these terms.

Issue A.2: DOE requests comment on whether additional equipment definitions are necessary to close any potential gaps in coverage between equipment types. DOE also seeks input on whether such products currently exist in the market or whether they are being planned for introduction. DOE also requests comment on opportunities to combine equipment classes that could reduce regulatory burden.

B. Market and Technology Assessment

The market and technology assessment that DOE routinely conducts when analyzing the impacts of a potential new or amended energy conservation standard provides information about the distribution transformers industry that will be used in DOE's analysis throughout the rulemaking process. DOE uses qualitative and quantitative information to characterize the structure of the industry and market. DOE identifies manufacturers, estimates market shares and trends, addresses regulatory and non-regulatory initiatives intended to improve energy efficiency or reduce energy consumption, and explores the potential for efficiency improvements in the design and manufacturing of distribution transformers. DOE also reviews product literature, industry publications, and company websites. Additionally, DOE considers conducting interviews with manufacturers to improve its assessment of the market and available technologies for distribution transformers.

1. Equipment Classes

When evaluating and establishing energy conservation standards, DOE may divide covered equipment into equipment classes by the type of energy used, or by capacity or other performance-related features that justify a different standard. (42 U.S.C. 6316(a); 42 U.S.C. 6295(q)) In making a determination whether capacity or another performance-related feature justifies a different standard, DOE must consider such factors as the utility of the feature to the consumer and other factors DOE deems appropriate. (*Id.*)

There are currently eleven equipment classes for distribution transformers, one of which (mining transformers) is not presently subject to energy conservation standards. 10 CFR 431.196. Ten of the eleven equipment classes are determined according to the following characteristics: (1) Type of transformer insulation: Liquid-immersed or dry-type, (2) Number of phases: Single or three, (3) Voltage class: Low or medium (for dry-type only), and (4) Basic impulse insulation level (BIL) (for MVDT only). The eleventh equipment class is for mining transformers, which is a reserved equipment class but is not currently subject to energy conservation standards. 10 CFR 431.196(d). Table II.3 of this document lists the current 11 equipment classes for distribution transformers.

TABLE II.3—EQUIPMENT CLASSES FOR DISTRIBUTION TRANSFORMERS

EC	Insulation	Voltage	Phase	BIL rating	kVA range
1	Liquid-immersed	Medium	Single		10–833 kVA.
2	Liquid-immersed	Medium	Three		15–2500 kVA.
3	Dry-type	Low	Single		15–333 kVA.
4	Dry-type	Low	Three		15–1000 kVA.
5	Dry-type	Medium	Single	20–45kV	15–833 kVA.
6	Dry-type	Medium	Three	20–45kV	15–2500 kVA.
7	Dry-type	Medium	Single	46–95kV	15–833 kVA.
8	Dry-type	Medium	Three	46–95kV	15–2500 kVA.
9	Dry-type	Medium	Single	≥96kV	75–833 kVA.
10	Dry-type	Medium	Three	≥96kV	225–2500 kVA.
11	Mining Distribution Transformers				

In the April 2013 standards rule, DOE added a definition for mining distribution transformers. 78 FR 23353–23354; 10 CFR 431.192. In deciding not to set standards for mining distribution transformers, DOE explained that mining transformers are subject to several constraints that are not usually concerns for transformers used in general power distribution. Specifically because space is critical in mines, an underground mining transformer may be at a considerable disadvantage in meeting an efficiency standard; these transformers must supply power at several output voltages simultaneously; and mining transformers in general perform a role that may differ from general power distribution in many regards, including lifetime, loading, and often the need to supply power at several voltages simultaneously. 78 FR 23353. DOE stated that it may consider establishing energy conservation standards for mining distribution transformers at a later date. 78 FR 23354. Specifically, DOE stated that it may set standards if it believes that these transformers are being purchased as a way to circumvent energy conservation standards for distribution transformers. *Id.*

Issue B.1: DOE requests information on the sale and use of mining transformers, including information about the applications for which mining transformers are currently being used, manufacturers of mining transformers, sales data identifying end-users, and information about the selling price. DOE requests comment on whether the features of mining transformers specified in the regulatory definition limit its use to mining applications, or whether they can be repurposed for general, above-ground service. DOE also requests data characterizing the relative performance abilities of mining transformers. In addition, if use of mining transformers is observed in applications other than underground, DOE requests comments on whether there are any technical aspects of mining transformers that can be identified to improve DOE's definition of mining transformers.

In the April 2013 standards rule, DOE also received several comments regarding potential new equipment class setting factors, in addition to those used to establish the equipment classes identified in Table II.3 of this document. 78 FR 23354–23359. Specifically, Table II.4 provides the potential equipment class setting factors (categories of transformers) that were identified. These potential class setting factors could, if warranted, be used to further subdivide the distribution transformers currently subject to standards, as well as any additional distribution transformers potentially considered in a future standards rulemaking. In the April 2013 standards rule, DOE determined that these categories of transformers did not warrant separate equipment classes, and accordingly, these transformers are subject to the existing equipment classes shown in Table II.3 of this document. DOE stated that it may consider establishing separate equipment classes for the same in the future.

TABLE II.4—POTENTIAL CLASS SETTING FACTORS FOR DISTRIBUTION TRANSFORMERS

Transformer category	Description
Step-up transformers	Transformers that increase voltage from primary to secondary (more secondary winding turns than primary winding turns).
Pole-mounted transformers	Transformers that are mounted above-ground on poles.
Pad-mounted transformers	Transformers that are ground mounted, specifically in a locked steel cabinet mounted on a concrete pad.
Network transformers *	Transformers that operate within a grid configuration and connect end loads to multiple distribution transformers simultaneously; often used for redundancy and in densely populated areas.
Vault-based transformers *	Transformers that have features unique to operation in a vault, which is a fully-enclosed chamber dedicated to housing the transformer and is not easily expandable.
Submersible transformers *	Transformers that are able to maintain indefinite rated operation while submerged.
Transformers with multi-voltage capacity.	Transformers that are able to be reconfigured to accommodate different primary and secondary voltages, in addition to those that can provide multiple voltages simultaneously.

* There may be considerable overlap between "network," "vault-based," and "submersible" transformers, *i.e.,* transformers with one of the three properties may often have another. However, they are separated here as they are not always linked and carry different features and limitations.

Issue B.2: DOE requests comment on whether equipment subject to present and potential future energy conservation standards should be classified based on the factors presented in Table II.4 in any potential future energy conservation standards rulemaking. If so, DOE requests information on (i) which new equipment class(es) should be included, and, (ii) how the performance-related features of equipment in the class affect both consumer utility and efficiency. Additionally, DOE requests comment on whether DOE should consider additional equipment classes not identified in the table, information on the performance-related features that provide unique consumer utility, and data detailing the corresponding impacts on energy use that would justify separate equipment classes.

Lastly, DOE also received comments from several stakeholders indicating BIL affects efficiency in liquid-immersed distribution transformers. 78 FR 23357–23358. Specifically, some commenters suggested setting separate energy conservation standards based on BIL for liquid-immersed distribution transformers. 78 FR 23357. Commenters stated that standards by BIL rating will help differentiate transformers that require more insulation and that are less efficient. *Id.* Several other stakeholders supported the concept of exploring how BIL affects efficiency but felt that it was not a significant enough issue to delay publication of the rule. *Id.* Specifically, commenters stated that the efficiency levels under consideration do not warrant separating by BIL and pointed out that the efficiency impacts of varied BIL were smaller in liquid-immersed than in dry-type transformers. *Id.* While DOE did not include equipment class by BIL rating in the April 2013 standards rule because DOE did not find a strong technological need for such separation at the efficiency levels under consideration, DOE did state that it may consider establishing equipment classes by BIL rating when considering future standards. 78 FR 23357–23358

Issue B.3: DOE requests comment on whether separate equipment classes by BIL rating should be considered for liquid-immersed distribution transformers. If so, please describe why and provide information to characterize the effect of BIL on performance.

2. Technology Assessment

In analyzing the feasibility of potential new or amended energy conservation standards, DOE uses information about existing and past technology options and prototype designs to help identify technologies that manufacturers could use to meet and/or exceed a given set of energy conservation standards under consideration. In consultation with interested parties, DOE intends to develop a list of technologies to consider in its analysis. That analysis will likely include a number of the technology options DOE previously considered during its most recent rulemaking for distribution transformers.

In the April 2013 standards rule, DOE identified several technology options and designs considered under that rulemaking.[7] 78 FR 23359. Increases in transformer efficiency are based on reduction of transformer losses. There are two main types of losses in transformers: No-load (core) losses and load (winding) losses. Measures taken to reduce one type of loss typically increase the other type of loss. Some examples of technology options to improve efficiency include: (1) Higher-grade electrical core steels, (2) different conductor types and materials, and (3) adjustments to core and coil configurations. A summary of the technology options from the April 2013 standards rule are presented in Table II.5 and Table II.6 of this document.

TABLE II.5—PREVIOUSLY CONSIDERED TECHNOLOGY OPTIONS AND IMPACTS OF INCREASING TRANSFORMER EFFICIENCY FOR THE APRIL 2013 STANDARDS RULE

	No-load losses	Load losses	Cost impact
To decrease no-load losses:			
Use lower-loss core materials	Lower	No change *	Higher.
Decrease flux density by:			
Increasing core cross-sectional area (CSA)	Lower	Higher	Higher.
Decreasing volts per turn	Lower	Higher	Higher.
Decrease flux path length by decreasing conductor CSA	Lower	Higher	Lower.
Use 120° symmetry in three-phase cores **	Lower	No change	TBD.

[7] A more detailed discussion can be found in section 3.8 of chapter 3, and chapter 4 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

TABLE II.5—PREVIOUSLY CONSIDERED TECHNOLOGY OPTIONS AND IMPACTS OF INCREASING TRANSFORMER EFFICIENCY FOR THE APRIL 2013 STANDARDS RULE—Continued

	No-load losses	Load losses	Cost impact
To decrease load losses:			
Use lower-loss conductor material	No change	Lower	Higher.
Decrease current density by increasing conductor CSA	Higher	Lower	Higher.
Decrease current path length by:			
Decreasing core CSA	Higher	Lower	Lower.
Increasing volts per turn	Higher	Lower	Lower.

* Amorphous core materials would result in higher load losses because flux density drops, requiring a larger core volume.
** Sometimes referred to as a "hexa-transformer" design.

TABLE II.6—OTHER PREVIOUSLY CONSIDERED TECHNOLOGY OPTIONS IN THE APRIL 2013 STANDARDS RULE *

Silver as a Conductor Material
High-Temperature Superconductors
Amorphous Core Material in Stacked Core Configuration
Carbon Composite Materials for Heat Removal
High-Temperature Insulating Material
Solid-State (Power Electronics) Technology
Nanotechnology Composites

* Note: These technology options were not listed as such in the April 2013 standards rule because they were removed in the screening analysis.

Issue B.4: DOE requests comment on the technologies listed in Table II.5 and Table II.6 of this document regarding their applicability to the current market, costs, and how these technologies may improve efficiency of distribution transformers as measured according to the DOE test procedure. DOE also seeks information on how these technologies and related costs may have changed since they were considered in the April 2013 standards rule. Specifically, DOE seeks information as to whether steel grades and fabrication techniques have been updated or improved since the April 2013 standards rule.

In addition, DOE has also identified several potential new technology options that could improve efficiency of distribution transformers. These new technology options are presented in Table II.7 of this document.

TABLE II.7—POTENTIAL NEW TECHNOLOGY OPTIONS FOR DISTRIBUTION TRANSFORMERS

Core Deactivation
Symmetric Core
Less-flammable insulating liquids

Core deactivation technology uses a system of smaller transformers to replace a single, larger transformer. For example, three 25 kVA transformers operating in parallel could replace a single 75 kVA transformer. A control unit constantly monitors the unit's power output, and based on the known efficiency of each combination of transformers for any given loading, the control unit operates the optimal number of cores. In the April 2013 standards rule, DOE stated that although core deactivation technology has some potential to save energy over a real-world loading cycle, those savings might not be represented in the current DOE test procedure, and that each of the constituent transformers must comply with the applicable energy conservation standard.[8] 78 FR 23360.

Symmetric core technology describes a design strategy wherein each leg of the transformer is connected to the other two. It uses a continuously wound core with 120-degree radial symmetry, resulting in a triangularly shaped core when viewed from above. Because of zero-sequence fluxes[9] associated with wye-wye connected transformers, symmetric core designs may be best suited to delta-delta or delta-wye connections. In the April 2013 standards rule, DOE lacked the data necessary to perform a thorough engineering analysis of symmetric core designs, and therefore did not consider symmetric core technology for the rulemaking.[10] 78 FR 23360–23362.

Less-flammable insulating liquid technology is specific to liquid-immersed distribution transformers and refers to filling these transformers with an insulating fluid of higher flash point[11] than that of traditional mineral oil. This technology can benefit certain applications in which a fire would be especially costly. In the April 2013 standards rule, DOE considered whether this technology might be disproportionally affected by standards set in the liquid-immersed equipment class and concluded that was not likely to be the case. Specifically, DOE received some feedback suggesting that less-flammable insulating liquids might be capable of higher efficiencies than mineral oil units because their higher temperature tolerances may allow the unit to be downsized and operated at higher temperatures than those using mineral oils.[12] 78 FR 23355.

Issue B.5: DOE requests comment on the technologies listed in Table II.7 of this document. Specifically, DOE seeks information about technological maturity, market adoption, costs, and any related concerns (*e.g.,* impacts on consumer utility). DOE further requests comment on its definition of core deactivation technology as a system of distribution transformers. DOE also seeks comment on other technology options that it should consider for inclusion in its analysis.

Issue B.6: DOE seeks comment on whether there have been sufficient technological or market changes since the most recent standards update that may justify a new rulemaking to consider more stringent standards. Specifically, DOE seeks data and information that could enable the agency to determine whether DOE should propose a "no new standard" determination because a more stringent standard: 1. would not result in a significant savings of energy; 2. is not technologically feasible; 3. is not

[8] A more detailed discussion can be found on page 3–28 of chapter 3 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[9] "Zero-sequence" is a term used to describe a state in which flux among a transformer's three electrical phases is occurring simultaneously, rather than at the usual staggered intervals. In this state, damage or failure can be mitigated if both connections (*i.e.,* input and output) are of the delta arrangement.

[10] A more detailed discussion can be found on page 3–29 of chapter 3 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[11] The flash point is the lowest temperature at which vapors above the fluid will ignite, given an ignition source.

[12] A more detailed discussion can be found on page 3–24 of chapter 3, and page 5–22 of chapter 5 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

economically justified; or 4. any combination of the foregoing.

3. Electrical Steel Market Assessment

a. Amorphous Steel—Producers

In its preliminary review of the amorphous steel market, DOE identified at least six companies with amorphous steel mills either already in production or at some stage of development. While DOE is aware of only one producer of amorphous ribbon in the United States; three companies in China have each recently increased their production capacity; one corporation has built a plant in South Korea and plans to enter the amorphous steel market; and an additional corporation produces at least some amorphous steel. DOE has found no indication that either of the two domestic electrical steel production companies have any plans to enter the amorphous steel market.

Issue B.7: DOE seeks comments, data, and information regarding current producers of amorphous steel and any barriers to entry by other producers or factors that could lead existing producers to exit the amorphous steel market. Comments may include, but are not limited to, identifying producers of amorphous steel not already identified in DOE's preliminary review of the amorphous steel market, and anticipated future trends in producers entering and exiting this market.

b. Amorphous Steel—Production Capacity

In its preliminary analysis of the steel market, DOE identified the quantity of amorphous steel produced by some of the companies currently in production. The global annual production capacity of amorphous ribbon of the one established producer is at least 100,000 tons of which 45,000 tons are located in the United States. Additionally, the three mills in China have recently increased their collective annual production capacity to 90,000 tons of amorphous steel and had plans, as of September 2016, to add an additional 40,000 to 50,000 tons in 2016.

Issue B.8: DOE seeks comments, data, and information quantifying and characterizing the current market capacity for amorphous steel, and potential changes in the production capacity as compared to current production capacity.

c. Amorphous Steel—Quality

In its preliminary analysis of the steel market, DOE also identified improvements in the quality of amorphous steel produced by some of the steel makers. In particular, the brittleness, stacking factor, and flux density of the amorphous steel produced in China have been improved since the April 2013 standards rule was issued. Additionally, the three companies in China can all now produce amorphous steel in the same widths as available on the U.S. market.

Issue B.9: DOE seeks comments, data, and information about historic trends in the quality of amorphous steel, the quality of the amorphous steel currently in production as it pertains to use in manufacturing energy-efficient distribution transformers. Additionally, DOE seeks comments, data, and information about any planned changes in the quality of amorphous steel and potential future trends in the quality of amorphous steel.

d. Non-Amorphous Steel—Market Conditions

In its preliminary review of the core steel market, DOE identified an increase in the use by transformer manufacturers of high permeability steels rather than M3 steel, which has resulted, in part, due to efficiency standards in the United States, the European Union, and India as well as China's efforts to improve the efficiency of its electricity grid.

Issue B.10: DOE seeks comments, data, and information about changes in the market conditions for low-voltage, dry-type distribution transformers that could inform DOE's decision to reevaluate the current energy conservation standards including any changes in the availability and quality of M4, M3, or other steels used in the manufacturing of efficient low-voltage dry-type distribution transformers.

C. Screening Analysis

The purpose of the screening analysis is to evaluate the technologies that improve equipment efficiency to determine which technologies will be eliminated from further consideration and which will be passed to the engineering analysis for further consideration.

DOE determines whether to eliminate certain technology options from further consideration based on the following criteria defined at 10 CFR part 430, subpart C, appendix A, 4(a)(4) and 5(b) as follows:

(1) *Technological feasibility.* Technologies that are not incorporated in commercial products or in working prototypes will not be considered further.

(2) Practicability to manufacture, install, and service. If it is determined that mass production of a technology in commercial products and reliable installation and servicing of the technology could not be achieved on the scale necessary to serve the relevant market at the time of the compliance date of the standard, then that technology will not be considered further.

(3) *Impacts on equipment utility or equipment availability.* If a technology is determined to have significant adverse impact on the utility of the equipment to significant subgroups of consumers, or result in the unavailability of any covered equipment type with performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as equipment generally available in the United States at the time, it will not be considered further.

(4) *Adverse impacts on health or safety.* If it is determined that a technology will have significant adverse impacts on health or safety, it will not be considered further.

Technology options identified in the technology assessment are evaluated against these criteria using DOE analyses and inputs from interested parties (*e.g.,* manufacturers, trade organizations, and energy efficiency advocates). Technologies that pass through the screening analysis are referred to as ''design options'' in the engineering analysis. Technology options that fail to meet one or more of the four criteria are eliminated from consideration.

Additionally, DOE notes that the four screening criteria do not directly address the propriety status of technology options. DOE only considers potential efficiency levels achieved through the use of proprietary designs in the engineering analysis if they are not part of a unique pathway to achieve that efficiency level (*i.e.,* if there are other non-proprietary technologies capable of achieving the same efficiency level).

Table II.8 summarizes the technology options that DOE screened out in the April 2013 standards rule, and the applicable screening criteria.

TABLE II.8—PREVIOUSLY SCREENED OUT TECHNOLOGY OPTIONS FROM THE APRIL 2013 STANDARDS RULE [13]

Technology option excluded	Eliminating screening criteria
Silver as a Conductor Material	Practicability to manufacture, install, and service.
High-Temperature Superconductors	Technological feasibility; Practicability to manufacture, install, and service.
Amorphous Core Material in Stacked Core Configuration	Technological feasibility; Practicability to manufacture, install, and service.
Carbon Composite Materials for Heat Removal	Technological feasibility.
High-Temperature Insulating Material	Technological feasibility.
Solid-State (Power Electronics) Technology	Technological feasibility; Practicability to manufacture, install, and service.
Nanotechnology Composites	Technological feasibility.

Issue C.1: DOE requests feedback on how the four screening criteria would relate to the possible technology options available for distribution transformers listed in section II.A of this document, and any other technologies not identified in this document.

Issue C.2: DOE seeks information on whether the technology options listed in section II.B.2 of this document would continue to be eliminated from further consideration based on the four screening criteria.

D. Engineering Analysis

The engineering analysis estimates the cost-efficiency relationship of equipment at different levels of increased energy efficiency (''efficiency levels''). This relationship serves as the basis for the cost-benefit calculations for consumers, manufacturers, and the Nation. In determining the cost-efficiency relationship, DOE estimates the increase in manufacturer production cost (''MPC'') associated with increasing the efficiency of equipment above the baseline, up to the maximum technologically feasible (''max-tech'') efficiency level for each equipment class.

DOE historically has used the following three methodologies to generate incremental manufacturing costs and establish efficiency levels (''ELs'') for analysis: (1) The design-option approach, which provides the incremental costs of adding to a baseline model design options that will improve its efficiency; (2) the efficiency-level approach, which provides the relative costs of achieving increases in energy efficiency levels, without regard to the particular design options used to achieve such increases; and (3) the cost-assessment (or reverse engineering) approach, which provides ''bottom-up'' manufacturing cost assessments for achieving various levels of increased efficiency, based on detailed cost data for parts and material, labor, shipping/packaging, and investment for models that operate at particular efficiency levels.

1. General Methodology

In the April 2013, standards rule, DOE based its engineering analysis on a design-option approach, in which design software was used to assess the cost-efficiency relationship between various design option combinations.[14] 78 FR 23364. DOE analyzed eleven equipment classes, as discussed in section II.B.1. DOE then further classified distribution transformers by their kVA rating, within each equipment class. These kVA ratings are essentially size categories, indicating the power handling capacity of the transformers. For the rulemaking, there was a total of 100 kVA ratings across all equipment classes.

DOE recognized that it would be impractical to conduct a detailed engineering analysis on each kVA rating, and therefore developed an approach that simplified the analysis while retaining reasonable levels of accuracy. DOE found that many of the units share similar designs and construction methods and, on that basis, DOE simplified the analysis by creating engineering design lines (DLs), which group kVA ratings based on similar principles of design and construction. The DLs subdivide the equipment classes to improve the accuracy of the engineering analysis. These DLs differentiate the transformers by insulation type (liquid immersed or dry-type), number of phases (single or three), and primary insulation levels for medium-voltage dry-type distribution transformers (three different BIL levels).[15] 78 FR 23364.

After developing its DLs, DOE then selected one representative unit from each DL for study, greatly reducing the number of units for direct analysis. These representative units are listed in Table II.9 of this document.

TABLE II.9—ENGINEERING DESIGN LINES AND REPRESENTATIVE UNITS

EC *	DL	Type of distribution transformer	kVA range	Representative unit
1	1	Liquid-immersed, single-phase, rectangular tank.	10–167	50 kVA, 65 °C, single-phase, 60Hz, 14400V primary, 240/120V secondary, rectangular tank, 95kV BIL.
1	2	Liquid-immersed, single-phase, round tank.	10–167	25 kVA, 65 °C, single-phase, 60Hz, 14400V primary, 120/240V secondary, round tank, 125 kV BIL.
1	3	Liquid-immersed, single-phase	250–833	500 kVA, 65 °C, single-phase, 60Hz, 14400V primary, 277V secondary, 150kV BIL.
2	4	Liquid-immersed, three-phase	15–500	150 kVA, 65 °C, three-phase, 60Hz, 12470Y/7200V primary, 208Y/120V secondary, 95kV BIL.

[13] A more detailed discussion can be found in chapter 4 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760*.

[14] A more detailed discussion can be found on page 5–2 of chapter 5 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760*.

[15] A more detailed discussion of the structure of the engineering analysis can be found on page 5–1 of chapter 5 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760*.

TABLE II.9—ENGINEERING DESIGN LINES AND REPRESENTATIVE UNITS—Continued

EC*	DL	Type of distribution transformer	kVA range	Representative unit
2	5	Liquid-immersed, three-phase	750–2500	1500 kVA, 65 °C, three-phase, 60Hz, 24940GrdY/14400V primary, 480Y/277V secondary, 125 kV BIL.
3	6	Dry-type, low-voltage, single-phase.	15–333	25 kVA, 150 °C, single-phase, 60Hz, 480V primary, 120/240V secondary, 10kV BIL.
4	7	Dry-type, low-voltage, three-phase	15–150	75 kVA, 150 °C, three-phase, 60Hz, 480V primary, 208Y/120V secondary, 10kV BIL.
4	8	Dry-type, low-voltage, three-phase	225–1000	300 kVA, 150 °C, three-phase, 60Hz, 480V Delta primary, 208Y/120V secondary, 10kV BIL.
6	9	Dry-type, medium-voltage, three-phase, 20–45kV BIL.	15–500	300 kVA, 150 °C, three-phase, 60Hz, 4160V Delta primary, 480Y/277V secondary, 45kV BIL.
6	10	Dry-type, medium-voltage, three-phase, 20–45kV BIL.	750–2500	1500 kVA, 150 °C, three-phase, 60Hz, 4160V primary, 480Y/277V secondary, 45kV BIL.
8	11	Dry-type, medium-voltage, three-phase, 46–95kV BIL.	15–500	300 kVA, 150 °C, three-phase, 60Hz, 12470V primary, 480Y/277V secondary, 95kV BIL.
8	12	Dry-type, medium-voltage, three-phase, 46–95kV BIL.	750–2500	1500 kVA, 150 °C, three-phase, 60Hz, 12470V primary, 480Y/277V secondary, 95kV BIL.
10	13A	Dry-type, medium-voltage, three-phase, 96–150kV BIL.	75–833	300 kVA, 150 °C, three-phase, 60Hz, 24940V primary, 480Y/277V secondary, 125kV BIL.
10	13B	Dry-type, medium-voltage, three-phase, 96–150kV BIL.	225–2500	2000 kVA, 150 °C, three-phase, 60Hz, 24940V primary, 480Y/277V secondary, 125kV BIL.

*There is not a 1:1 correspondence of equipment classes and design lines.

Issue D.1: For each representative unit, DOE generated hundreds of unique designs by contracting with Optimized Program Services, Inc. (OPS), a software company specializing in transformer design. The OPS software used three primary inputs that it received from DOE: (1) A design option combination, which included core steel grade, primary and secondary conductor material, and core configuration; (2) a loss valuation combination; and (3) material prices. For each representative unit, DOE examined anywhere from 8 to 16 design option combinations and for each design option combination, the OPS software generated 518 designs based on unique loss valuation combinations. These loss valuation combinations are known in industry as A and B evaluation combinations, and represent a commercial consumer's present value of future losses in a transformer core and winding, respectively. For each design option combination and A and B combination, the OPS software generated an optimized transformer design based on the material prices that were also part of the inputs. Consequently, DOE obtained thousands of transformer designs for each representative unit. The performance of these designs ranged in efficiency from a baseline level, equivalent to the current distribution transformer energy conservation standards, to a theoretical max-tech efficiency level. DOE requests comment on whether a future rulemaking, if initiated, should include a greater breadth or depth of engineering design simulations.

After generating each design, DOE used the outputs of the OPS software to help create a manufacturer selling price (MSP). The material cost corresponding to the outputs of the OPS software, along with labor estimates, were marked up for scrap factors, factory overhead, shipping, and non-production costs to generate a MSP for each design. Thus, DOE obtained a cost versus efficiency relationship for each representative unit. Finally, after DOE generated the MSPs versus efficiency relationship for each representative unit, it extrapolated the results to the other, unanalyzed, kVA ratings within that same engineering design line.

Issue D.2: DOE requests comment on whether its method of performing the engineering analysis should be maintained in any future rulemaking analysis, if conducted.

Issue D.3: DOE requests comment on whether there are additional methods to establish the relationship between transformer selling price and efficiency. For example, DOE seeks comment on whether bid responses for publicly owned utilities would provide a representative design and pricing data to develop a more accurate cost-efficiency relationship and whether such data exists in sufficient volume at efficiency levels above the Federal minimum.

2. Price Inputs to Analysis

As described at the beginning of this section, the main outputs of the engineering analysis are cost-efficiency relationships that describe the estimated increases in MPC associated with higher-efficiency equipment for each analyzed equipment class. For distribution transformers, one of the inputs to the MPC is the materials costs. The primary material costs in distribution transformers come from electrical steel used for the core and the aluminum or copper conductor used for the primary and secondary winding. DOE attempted to account for the frequent fluctuation in price of these commodities by examining prices over multiple years.

For the April 2013 standards rule, DOE used its estimates of both 2010-year and 2011-year prices as reference cases for results. To construct materials price estimates, DOE spoke with manufacturers, suppliers, and industry experts to determine the prices paid for each raw material used in a distribution transformer. DOE developed an average materials price for the year based on the price a medium-to-large manufacturer would pay.[16] 78 FR 23367.

The prices of aluminum and copper conductor, in particular, correlated strongly to the price of the underlying commodities, which are tracked in various public indices (*e.g.* the LME). As a result, extrapolation of 2010- and 2011-year prices using the index prices of a future time period may yield sufficiently accurate conductor prices for that time period. Extrapolation of past conductor prices may be more accurate than direct use of the index prices, as the latter do not include

[16] A more detailed discussion can be found on page 5–40 of chapter 5 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

transformer industry-specific costs such as drawing into wire and shipping.

Issue D.4: DOE requests comment on whether metals price indices, such as those published by the London Metal Exchange (LME) and CME Group (*e.g.,* the COMEX), may be reliably used to extrapolate 2010 and 2011 prices to the present. DOE requests comment on whether there are any other price indices that should be considered. DOE also requests comment on the impact of tariffs on the price of raw materials used manufacturing distribution transformers.

a. Liquid-Immersed Transformers

Table II.10 and Table II.11 respectively contain material price data for liquid-immersed distribution transformers relied upon in the April 2013 standards rule.[17]

TABLE II.10—TYPICAL MANUFACTURER'S MATERIAL PRICES FOR LIQUID-IMMERSED DESIGN LINES FROM THE APRIL 2013 STANDARDS RULE

Item and description	2010 price	2011 price
M6 core steel	1.33	1.04
M5 core steel	1.38	1.10
M4 core steel	1.45	1.20
M3 core steel	1.88	1.30
M3 Lite Carlite core steel	1.95	1.95
M2 core steel	2.00	1.40
M2 Lite Carlite core steel	2.10	2.10
ZDMH (mechanically-scribed core steel)	2.05	1.90
SA1 (amorphous)—finished core, volume production	2.38	2.20
Copper wire, formvar, round #10–20	4.87	4.87
Copper wire, enameled, round #7–10	4.84	4.84
Copper wire, enameled, rectangular sizes	4.97	4.97
Aluminum wire, formvar, round #9–17	3.07	3.07
Aluminum wire, formvar, round #7–10	2.57	2.57
Copper strip, thickness range 0.02–0.045	4.97	4.97
Copper strip, thickness range 0.030–0.060	4.97	4.97
Aluminum strip, thickness range 0.02–0.045	2.08	2.08
Aluminum strip, thickness range 0.045–0.080	2.08	2.08
Kraft insulating paper with diamond adhesive	1.52	1.52
Mineral oil	3.35	3.35
Tank Steel	0.38	0.38

TABLE II.11—SUMMARY TABLE OF FIXED MATERIAL COSTS FOR LIQUID-IMMERSED UNITS FROM THE APRIL 2013 STANDARDS RULE

Item and description	DL1	DL2	DL3	DL4	DL5
High voltage bushings	$28	$6	$6	$21	$60
Low voltage bushings	$30	$8	$60	$24	$160
Core clamp, nameplate, and misc. hardware	41.65	19.15	50.65	75.65	105.65
Transformer tank average cost*	~143	~73	~629	~389	~1,016

Issue D.5: DOE requests comment on the prices of materials and labor used to construct liquid-immersed distribution transformers, including all grades of electrical steel, that are presented in section II.D.2.a. Such data may include data both in absolute terms and expressed relative to the 2010 and 2011 estimates from the April 2013 standards rule.

b. Dry-Type Transformers

Table II.12 and Table II.13 respectively contain material cost data for dry-type distribution transformers relied upon in the April 2013 standards rule.[18]

TABLE II.12—MANUFACTURER'S MATERIAL PRICES FOR DRY-TYPE DESIGN LINES FROM THE APRIL 2013 STANDARDS RULE

Item and description	2010 price	2011 price
M36 core steel (26 gauge)	0.60	0.66
M19 core steel (26 gauge)	0.83	0.91
M12 core steel	0.95	0.78
M6 core steel	1.33	1.04
M5 core steel	1.38	1.10
M4 core steel	1.45	1.20
M3 core steel	1.88	1.30

[17] Materials prices for liquid-immersed distribution transformers were not presented in the final rule **Federal Register** notice, but can be found on page 5–42 of chapter 5 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[18] Materials prices for dry-type transformers were not presented in the final rule **Federal Register** notice, but can be found on page 5–44 of chapter 5 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

TABLE II.12—MANUFACTURER'S MATERIAL PRICES FOR DRY-TYPE DESIGN LINES FROM THE APRIL 2013 STANDARDS RULE—Continued

Item and description	2010 price	2011 price
M2 core steel	2.00	1.40
H–0 DR core steel (laser-scribed)	2.06	1.70
SA1 (amorphous)—finished core, volume production	2.38	2.20
Copper wire, rectangular 0.1 × 0.2, Nomex wrapped	4.52	4.52
Aluminum wire, rectangular 0.1 × 0.2, Nomex wrapped	2.97	2.97
Copper strip, thickness range 0.02–0.045	4.97	4.97
Aluminum strip, thickness range 0.02–0.045	2.08	2.08
Nomex insulation (per pound)	24.50	24.50
Cequin insulation (per pound)	5.53	5.53
Impregnation (per gallon)	22.55	22.55
Winding Combs (per pound)	12.34	12.34
Enclosure Steel (per pound)	0.38	0.38

TABLE II.13—SUMMARY TABLE OF FIXED MATERIAL COSTS FOR DRY-TYPE UNITS FROM THE APRIL 2013 STANDARDS RULE

Item	DL $6	DL $7	DL $8	DL $9	DL $10	DL $11	DL $12	DL $13A	DL $13B
LV and HV terminals (set)	4	n/a	n/a	75	120	100	135	115	150
HV terminal board(s)	n/a	27	27	27	27	27	27	27	27
LV bus-bar	n/a	10.50	22.50	80	140	80	192	100	270
Core/coil mounting frame	9.25	19	36	36	120	42	125	50	175
Additional Bracing	n/a	n/a	n/a	n/a	~230	n/a	~270	n/a	~330
Nameplate	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Dog-bone duct spacer (ft.)	0.24	0.32	0.42	0.42	0.52	0.42	0.56	0.42	0.60
Winding combs (lb.)	n/a	n/a	n/a	n/a	n/a	10.00	10.00	10.00	10.00
Misc. hardware	4.50	7	12	25	42	32	54	36	60
Enclosure (12, 14 gauge)	~50	~90	~100	~135	~400	~200	~450	~200	~450

Issue D.6: DOE requests comment on the prices of materials used to construct dry-type distribution transformers, including all grades of electrical steel, that are presented in section II.D.2.b. Such data may include data both in absolute terms and expressed relative to the 2010 and 2011 estimates from the April 2013 standards rule.

c. Labor Markups

Table II.14 contains labor cost data for both liquid-immersed and dry-type manufacturers relied upon in the April 2013 standards rule.[19]

TABLE II.14—LABOR MARKUPS FOR LIQUID-IMMERSED AND DRY-TYPE MANUFACTURERS

Item description	Markup percentage	Rate per hour ($)
Labor cost per hour *	....	16.80
Indirect Production **	33	22.35
Overhead ***	30	29.05
Fringe †	24	36.03
Assembly Labor Up-time ††	43	51.52
Fully-Burdened Cost of Labor	25	64.40

* Cost per hour is from U.S. Census Bureau, 2007 Economic Census—Detailed Statistics, published October 2009. Data for NAICS code 3353111 ''Power and distribution transformers, except parts'' Production workers' hours and wages.

** Indirect production labor (*e.g.,* production managers, quality control) as a percent of direct labor on a cost basis. Navigant Consulting, Inc. (NCI) estimate.

*** Overhead includes commissions, dismissal pay, bonuses, vacation, sick leave, and social security contributions. NCI estimate.

† Fringe includes pension contributions, group insurance premiums worker's compensation. Source: U.S. Census Bureau, 2007 Economic Census—Detailed Statistics, published October 2009. Data for NAICS code 3353111 ''Power and distribution transformers, except parts'' Total fringe benefits as a percent of total compensation for all employees (not just production workers).

†† Assembly labor up-time is a factor applied to account for the time that workers are not assembling units and/or reworking unsatisfactory units. The markup of 43 percent represents a 70 percent utilization (multiplying by 100/70). NCI estimate.

Issue D.7: DOE requests comment on the prices of labor used to construct distribution transformers that are presented in section II.D.2.c. of this document. Such data may include data both in absolute terms and expressed relative to estimates from the April 2013 standards rule.

3. Load Loss Scaling

Currently, DOE energy conservation standards apply only at a single per-unit load (PUL) value for a given distribution

[19] Labor markups were not presented in the final rule **Federal Register** notice, but can be found on page 5–49 of chapter 5 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

transformer equipment class (*e.g.,* 50% for liquid-immersed). 10 CFR 431.196. However, distribution transformers exhibit varying efficiency with varying PUL.

Distribution transformer loss is commonly separated into ''load'' and ''no-load'' components. The former is often approximated as a quadratic function of PUL, *i.e.,* load losses grow in proportion to the square of PUL. 78 FR 23372. Transformers in service may deviate from this simplified assumption for a variety of reasons (*e.g.,* temperature rise) and DOE is requesting comment on the nature and magnitude of that deviation.

Issue D.8: DOE requests comment on how load losses vary as a function of per-unit load. Specifically, DOE seeks mathematical characterizations of load losses, expressed as a function of PUL. DOE is especially interested in learning about formulas that may be more accurate than the widely used quadratic approximation, and explanations of the bases of those formulas.

E. Distribution Channels

In generating end-user price inputs for the life-cycle cost (''LCC'') analysis and national impact analysis (''NIA''), DOE must identify distribution channels (*i.e.,* how the products are distributed from the manufacturer to the consumer), and estimate relative sales volumes through each channel Markups depend on the distribution channels for the different equipment classes and consumer types, for both new construction and replacement equipment. In the April 2013 standards rule, DOE characterized these distribution channels as described in the following sections and shown in Table II.15 of this document.

1. Liquid-Immersed Distribution Transformers

DOE assumed for liquid-immersed distribution transformers sold to investor-owned utilities (IOUs) that 82 percent of sales were direct from the manufacturer to a utility consumer through a national account, and the remaining 18 percent of sales were through a transformer distributor.[20] 78 FR 23371. For liquid-immersed distribution transformers sold to publicly owned utilities, DOE assumed that all sales were through a transformer distributor.[21]

2. Dry-Type Distribution Transformers

In the April 2013 rule, DOE assumed dry-type distribution transformers were installed by an electrical contractor. An electrical contractor usually purchases the distribution transformer from a distributor, and in this case, DOE assumed it was appropriate to include a contractor markup.

TABLE II.15—DISTRIBUTION CHANNELS FOR DISTRIBUTION TRANSFORMERS

Type	Consumer	Market share (%)	Distribution channel
Liquid-immersed	Investor-owned utility	82	Manufacturer (National Account) → Consumer.
		18	Manufacturer → Distributor → Consumer.
	Publicly-owned utility	100	Manufacturer → Distributor → Consumer.
LVDT	All	100	Manufacturer → Distributor → Electrical contractor → Consumer.
MVDT	All	100	Manufacturer → Distributor → Electrical contractor → Consumer.

Issue E.1: DOE seeks input from stakeholders on whether the distribution channels described above continue to accurately describe the distribution chain for distribution transformers and are sufficient to describe the distribution market.

Issue E.2: DOE seeks input on the percentage of equipment distributed through the different distribution channels, and whether the share of equipment through each channel varies based on equipment capacity, or number of phases, or other equipment characteristics.

F. Energy Use Analysis

As part of the rulemaking process, DOE conducts an energy use analysis to identify how products are used by consumers, and thereby determine the energy savings potential of energy efficiency improvements. The energy-use analysis produces energy use estimates and end-use load shapes for distribution transformers. The energy use estimates enable evaluation of energy savings from the operation of distribution transformers at various efficiency levels, while the end-use load characterization allows evaluation of the impact on monthly and peak demand for electricity.

The energy used by distribution transformers is characterized by two types of losses. The first are no-load losses, which are also known as core losses. No-load losses are roughly constant and exist whenever the transformer is energized (*i.e.,* connected to live power lines). The second are load losses, which are also known as resistance or I^2R losses. Load losses generally vary with the square of the PUL being served by the transformer.

DOE is considering using the same methodology for its energy-use analysis as it did in the April 2013 standards rule, where it assumed the following: (1) Application of distribution transformers vary significantly by transformer type (liquid-immersed or dry-type) and ownership; (2) electric utilities own approximately 95 percent of liquid-immersed transformers; and (3) commercial/industrial (C&I) entities use mainly dry-type distribution transformers. To account for the differences in transformer application, in the April 2013 standards rule, DOE performed two separate end-use load analyses to evaluate distribution transformer efficiency, as described in the following sections.[22] 78 FR 23372.

1. Hourly Load Analysis

The hourly load analysis for liquid-immersed distribution transformers used two types of information related to electric utilities. The first was drawn from the Energy Information Administration's (EIA's) Form 861

[20] A more detailed discussion can be found on page 6–7 of chapter 6 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[21] Distribution channels are discussed in detail on page 6–1 of chapter 6 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[22] The energy-use analysis is discussed in detail in Chapter 7 and Appendix 7A of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

database.[23] Form 861 provides, through its Form 2, the annual sales in megawatt-hours for each utility to the residential, commercial, and industrial sectors. Form 861's Form 4 lists all the utilities that own electricity distribution equipment, and the county in which that equipment is located. Based on those data, DOE created a consumer sample of utilities that own transformers and assigned a sample weight to each based on the electricity sales of that utility.

The second type of utility information used is hourly system loads and prices. DOE developed regional system loads and prices for the set of regions defined in the EIA National Energy Modeling System (NEMS) Electricity Market Module (EMM).[24] The regions represent both national reliability regions and, where they exist, integrated wholesale electricity markets. Each region in turn comprises a number of electric utility control area operators (CAOs), some of which may also be utility companies. DOE obtained hourly load and system lambda data (for regions without wholesale markets) or day-ahead market price data (for market regions) from the Federal Energy Regulatory Commission (FERC) Form 714 database.[25] DOE aggregated the hourly data to produce regional time series for the EMM regions.[26]

From these data, DOE estimated the loads on individual liquid-immersed distribution transformers for both residential and non-residential utility consumers by creating hourly proxy transformer loads. These resulted in the initial (first year) RMS load for liquid-immersed transformers ranging from 34 and 40 percent for single- and three-phase equipment, respectively. Additionally, as in the April 2013 standards rule, DOE is considering projecting the energy consumption for distribution transformers into the future. This projection included a 0.5 percent per-year load growth factor to account for utility growth in the connected load on liquid-immersed distribution transformers, and no-load growth for LVDT and MVDT transformers.[27] 78 FR 23375.

Issue F.1: DOE requests comment on whether it should use the hourly load analysis for liquid-immersed distribution transformers relied upon in April 2013 standards rule and what updates to the inputs should be considered. Included in the type of information that DOE would find useful are: (i) Sources of data and recommendations to support an hourly load model; (ii) data on utility-owned distribution transformer hourly loads for the liquid-immersed equipment classes under consideration; (iii) field or simulated energy use data or other relevant information that could assist in the development or calibration for its hourly load analysis; (iv) data and information supporting or refuting the assumption that larger capacity liquid-immersed transformers are loaded to a higher degree than smaller capacity liquid-immersed transformers, and; (v) any other data commenters believe would be relevant.

Issue F.2: DOE requests comment on the appropriateness of its prior assumption of future load growth. Examples of information requested include, but are not limited to, sources of data or recommendation to support to an annual load growth assumption, and information on whether the growth of connected loads would vary with geography, transformer type, capacity, or phase-count.

a. Utilities Serving Low Population Densities

DOE recognizes that in rural areas, the number of utility customers per distribution transformer is likely to be significantly lower than in urban or suburban areas, which in turn results in lower PULs. DOE is considering using the same methodology that it used in the April 2013 standards rule, where the PUL was reduced by 10 percent for utilities serving counties with less than 32 households per square mile.[28]

Issue F.3: DOE seeks comment on the continued appropriateness of the adjustment to the PUL for areas with low population density, including information and data as to the PULs experienced by transformers in-service in low population density areas.

2. Monthly Load Analysis

The consumer sample for the monthly load analysis used for LVDT and MVDT distribution transformer owners was taken from the EIA's Commercial Buildings Energy Consumption Survey (CBECS) databases.[29] Survey data for the years 1992 and 1995 were used, as these are the only years for which monthly consumer electricity consumption (kWh) and peak demand (kW) are provided. To account for changes in the distribution of building floor space by building type and size, the weights defined in the 1992 and 1995 building samples were rescaled to reflect the distribution in the 2012 CBECS survey. CBECS covers primarily commercial buildings, but a significant fraction of transformers are shipped to industrial building owners. To account for this in the sample, data from the EIA's 2010 Manufacturing Energy Consumption Survey (MECS) [30] was used to estimate the amount of floor space of buildings that might use the type of transformer covered by the rulemaking. The statistical weights assigned to the building sample were rescaled to reflect this additional floor space.

From these data, in the April 2013 standards rule, DOE estimated that on average, the RMS PUL for LVDT transformers ranged from 20 and 25 percent for commercial and industrial consumers, respectively;[31] and that, on average, the RMS PUL for MVDT transformers ranged from 32 and 38 percent for commercial and industrial consumers, respectively.[32]

Issue F.4: DOE requests comment on the methodology for determining monthly loads for LVDT and MVDT

[23] U.S. Department of Energy-Energy Information Administration. *Form EIA–861: Annual Electric Power Industry Database. (2008).* at *http://www.eia.doe.gov/cneaf/electricity/page/eia861.html.*

[24] Energy Information Administration—Office of Integrated Analysis and Forecasting. *The National Energy Modeling System (NEMS): An Overview.* (U.S. Department of Energy, 2009). at *http://www.eia.doe.gov/oiaf/aeo/overview/.*

[25] U.S. Department of Energy-Federal Energy Regulatory Commission. Form No. 714—*Annual Electric Control and Planning Area Report.* (U.S. Department of Energy-Federal Energy Regulatory Commission, 2008). at *http://www.ferc.gov/docs-filing/forms/form-714/overview.asp.*

[26] The hourly load analysis is discussed in detail in Chapter 7 and Appendix 7A of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[27] A more detailed discussion can be found on page 8–25 of chapter 8 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[28] PUL estimates for utilities serving low population densities were not presented in the final rule **Federal Register** notice, but can be found on page 8–16 of chapter 8 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[29] Commercial Building Energy Consumption and Expenditures Survey (CBECS); 1992 and 1995; U.S. Department of Energy—Energy Information Administration; *http://www.eia.doe.gov/emeu/cbecs/microdat.html.*

[30] Manufacturing Energy Consumption Survey (MECS); 2006 U.S. Department of Energy—Energy Information Administration; *http://www.eia.gov/emeu/mecs/contents.html.*

[31] The result of DOE's transformer load analysis for LVDT distribution transformers are contained in the Life-cycle Cost and Payback Period spreadsheet tools for DLs 6 through 8 on the Forecast Cells tab. (available at: *https://www.regulations.gov/document?D=EERE-2011-BT-STD-0051-0085*)

[32] The result of DOE's transformer load analysis for MVDT distribution transformers are contained in the Life-cycle Cost and Payback Period spreadsheet tools for DL 9 through 13B on the Forecast Cells tab. (available at: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0764*)

equipment classes relied upon in the April 2013 standards rule and whether DOE should consider changes to the methodology.

Issue F.5: DOE requests comment on the appropriateness of the data sources relied upon for determining monthly loads for LVDT and MVDT equipment classes in the April 2013 standards rule and whether additional sources should be considered. Comments may include field or simulated energy use data or other relevant information that could assist in the development or calibration for its monthly load analysis.

G. Life-Cycle Cost and Payback Period Analysis

The purpose of the LCC and PBP analyses is to evaluate the economic impacts of potential energy conservation standards on individual consumers. The effect of new or amended energy conservation standards on consumers usually involves a reduction in operating cost and an increase in purchase cost.

DOE intends to analyze the potential for variability by performing the LCC and PBP calculations on a representative sample of individual consumers. DOE plans to utilize the sample of buildings developed for the energy use analysis and the corresponding simulation results.[33] DOE plans to model uncertainty in many of the inputs to the LCC and PBP analysis using Monte Carlo simulation and probability distributions. As a result, the LCC and PBP results will be displayed as distributions of impacts compared to the no-new-standards case (without amended standards) conditions.

Issue G.1: DOE requests comment on the overall methodology that it intends to use to conduct the LCC and PBP analysis for distribution transformers.

1. Base-Case Efficiency Distributions

To determine an appropriate base case against which to compare various potential standard levels, in the April 2013 standards rule DOE incorporated in the LCC calculations a purchase-decision model that specifies which of the hundreds of designs from the engineering database are likely to be selected by transformer purchasers to meet a given efficiency level. The engineering analysis yielded a cost-efficiency relationship in the form of MSPs, no-load losses, and load losses for a wide range of realistic transformer designs. This set of data provides the LCC model with a distribution of transformer design choices.

If it determines that a rulemaking is necessary, DOE plans on using the same approach as in the April 2013 standards rule that employs the selection criteria known in the transformer industry as total owning cost (TOC). The TOC method combines transformer first costs with the consumer's cost of losses to produce a present value of losses over the lifetime of a transformer. Consumers of distribution transformers, especially in the utility sector, have long used the TOC method to determine which transformers to purchase. DOE refers to those consumers who employ the TOC method to determine which transformer to purchase in the context of the LCC as ''evaluators''.

In the April 2013 standards rule, DOE assumed the following fraction of consumers to be evaluators: 10 percent for liquid-immersed transformers, and 2 percent for both LVDT and MVDT transformers. DOE assumed the fraction of evaluators to select a transformer with the best TOC for their cost of losses (this was usually of higher efficiency than the baseline), while the remaining consumers, who were not considered evaluators, selected new distribution transformers at the baseline efficiency.[34] 78 FR 23374.

Issue G.2: DOE seeks information on the fraction of consumers who employ an evaluation methodology, such as the Total Owning Cost methodology,[35 36] that may lead to transformer purchases at a cost greater than lowest-first-costs. Further, DOE seeks information on whether this changes with the size of consumer (in terms of peak demand), or by equipment class or equipment capacity.

Issue G.3: DOE seeks information on the fraction of consumers who purchase LVDT transformers at efficiencies at, or greater than, those specified under the NEMA Premium Efficiency Transformer Program.[37]

2. Installation Costs

The primary inputs for establishing the total installed cost are the baseline consumer price, standard-level consumer price increases, and installation costs. Baseline transformer prices and standard-level transformer price increases will be determined by applying markups to MSP estimates.

a. Impact of Increased Distribution Transformer Weight on Installation Costs

Total installed costs for distribution transformers dependent heavily on the weight of the equipment. DOE plans to derive the weight-versus-capacity relationship for a typical distribution transformer from the design data produced by the engineering analysis as it did in the April 2013 standards rule. DOE estimated a scaling relationship between transformer weight, and direct installation labor and equipment costs from RSMeans for the electrical equipment categories: ''dry-type transformer'', ''oil-filled transformer'', and ''transformer, liquid-filled''.[38]

Issue G.4: DOE seeks information and data on the installation cost versus transformer weight relationship for the different types of transformers and capacities under consideration.

b. Estimation of Pole Replacement Costs

In addition to including installation costs that scale with transformer weight, DOE is considering including costs to account for the rare occasion that a more efficient pole-mounted replacement transformer may require the installation of a new, higher-grade, utility pole to support any increase in weight due to increased transformer efficiency.[39] If it determines that a rulemaking is necessary, DOE plans to use the same methodology it used in the April 2013 standards rule, where the pole-replacement cost function was applied to those modelled design lines that included pole-mounted distribution transformers.[40] 78 FR 23374.

[33] DOE plans to utilize the utility information from EIA-Form 851 and FERC No. 714, commercial, and manufacturing building types defined in CEBCS and MECS databases.

[34] The transformer selection approach is discussed in detail in chapter 8 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[35] IEEE, *Loss Evaluation Guide for Power Transformers and Reactors,* 1992, DOI: 10.1109/IEEESTD.1992.114388.

[36] United States Department Of Agriculture: Rural Utilities Services, *Guide for Economic Evaluation of Distribution Transformers, August 2016,* RUS Bulletin 1724D–107, See: *https://www.rd.usda.gov/files/UEP_Bulletin_1724D-107.pdf.*

[37] See: *https://www.nema.org/Technical/Pages/NEMA-Premium-Efficiency-Transformers-Program.aspx*

[38] See page 6–2 of chapter 6 of the April 2013 standards rule Technical Support Document for a more detailed discussion on transformer installation costs, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[39] In the April 2013 standards rule DOE estimated an average relative increase in transformer weight when compared to baseline equipment to be between 14 percent and 4 percent for DL 2, and DL 3, respectively. In absolute terms, the average weight increase was between 48 lbs. and 120 lbs. for DL 2, and DL3, respectively. The results of DOE's pole replacement analysis for pole-mounted liquid-immersed distribution transformers are contained in the Life-cycle Cost and Payback Period spreadsheet tools for DL 2 and DL 3 on the Forecast Cells tab. (available at: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0767*)

[40] See page 6–2 of chapter 6 of the April 2013 standards rule Technical Support Document for a more detailed discussion on transformer installation costs, available from: *https://*

The degree of weight increase depends on how a transformer design is modified to improve efficiency. For pole-mounted transformers (represented by design lines 2 and 3 in the April 2013 standards rule), the increased weight may lead to situations where the pole needs to be upgraded to support the additional weight of the transformer, which in turn, leads to an increase in the installation cost.

The methodology employed in the April 2013 standards rule established the threshold change in weight of the transformer between the no-new standards case and standard case level that would trigger the need to upgrade the utility pole to support the new more efficient transformer. DOE assumed that a pole change-out would only be necessary if the weight increase was greater than 15 percent of the base case and was also 150 pounds heavier than the weight of the base case unit for a25 kVA unit. To determine the weight-change threshold for larger capacity units (*i.e.,* 500kVA), the 150-pound threshold was scaled using the 0.75 scaling rule [41] to 1,418 pounds. In some cases, utilities have the option to reinforce pole or structures with guy wires instead of outright pole replacement. Because of the general practice of over-sizing of utility poles for safety reasons, and the availability of other supporting options, DOE limited the total fraction of pole replacements to 25 percent of the total population. 78 FR 23374–23375

Issue G.5: DOE seeks comment on its prior approach to accounting for the need for pole replacement, including data on the rate of pole change-out that is driven by the increased weight of more efficient distribution transformers of the same capacity.

The cost of pole replacement typically involves the removal of the old pole and its disposal, erection of the upgraded replacement pole, and the transferring of all attached equipment and concessions. DOE plans on using the labor and equipment cost estimates from the RSMeans, to construct a distribution of possible costs paid by a utility when performing a pole replacement for single pole, and multi-pole (platform) replacements.

Issue G.6: DOE seeks comment on its understanding of utility pole upgrades that result from an increase in transformer weight; the continued appropriateness of this consideration, including but not limited to information and data on the rate of pole change-out and on the cost of pole replacement by transformer capacity.

Issue G.7: DOE seeks information on any other factors that would impact transformer installations costs due to an increase in transformer efficiency.

3. Electricity Prices

DOE plans to estimate electricity prices and costs to place a value on transformer losses using the same methodologies it used in the April 2013 standards rule. One hourly methodology captured the nature of regional hourly transformer loads, their correlation with the overall utility system load, and their correlation with hourly electricity costs and prices. The monthly methodology estimated the impacts of transformer loads and resultant losses on monthly electricity usage, demand, and electricity bills. DOE plans to use the hourly analysis for liquid-immersed transformers, which are owned predominantly by utilities that pay costs that vary by the hour, and the monthly analysis for dry-type transformers, which typically are owned by commercial and industrial establishments that receive monthly electricity bills.[42] 78 FR 73375–73377.

a. Hourly Electricity Costs

To evaluate the electricity costs associated with liquid-immersed distribution transformers, DOE plans to use marginal electricity prices. Marginal prices are those utilities pay for the last kilowatt-hour of electricity produced and may be higher or lower than the average price, depending on the relationships among capacity, generation, transmission, and distribution costs. The general structure of the hourly marginal cost methodology divides the costs of electricity into capacity components and energy cost components. For each component, the economic value for both no-load losses and load losses is estimated. The capacity components include generation and transmission capacity; it also includes a reserve margin for ensuring system reliability, with factors that account for system losses. Energy cost components include a marginal cost of supply that varies by the hour.

DOE plans on using a marginal costs methodology for the set of EMM regions. To calculate the hourly price of electricity, DOE plans on using the day-ahead market clearing price for regions having wholesale electricity markets, and system lambda values for all other regions. System lambda values, which are roughly equal to the operating cost of the next unit in line for dispatch, are filed by control area operators under FERC Form 714. DOE plans on using the most recent data available for both market prices and system lambdas.

Issue G.8: DOE seeks comment on its approach for developing hourly electricity prices, as well as additional sources of relevant data.

b. Monthly Electricity Costs

To evaluate the electricity costs associated with LVDT and MVDT distribution transformers, DOE plans to derive nationally representative distributions of annual electricity prices for different consumer categories (industrial, commercial, and residential) from the most recent data available in the EIA Form 861, ''Annual Electric Power Industry Report,'' as well as data from the Edison Electric Institute.[43]

Issue G.9: DOE seeks comment on its approach for developing monthly electricity prices as well as additional sources of relevant data.

4. Future Electricity Prices

DOE plans to use projections of national average energy prices for commercial and industrial consumers to estimate future energy prices. DOE will use the most recent available edition of AEO as the default source of projections for future energy prices.

Issue G.10: DOE seeks comment on its consideration of future electricity prices as well as additional relevant sources for projecting future electricity prices.

H. Shipments

DOE develops shipments forecasts of distribution transformers to calculate the national impacts of potential amended energy conservation standards on energy consumption, net present value (''NPV''), and future manufacturer cash flows. DOE shipments projections are based on available historical data broken out by equipment class and capacity. Current sales estimates allow for a more accurate model that captures recent trends in the market.

In the April 2013 standards rule, DOE used sales estimates for the entire market for distribution transformers for years 2001 and 2009, disaggregated by transformer type (liquid-immersed or

www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.

[41] The 0.75 Scaling Rule holds that for similarly designed transformers, costs of construction and losses scale with the ratio of their kVA ratings raised to the 0.75 power. See 78 FR 23369 for a more detailed description of the 0.75 Scaling Rule.

[42] A more detailed discussion can be found on page 8–17 of chapter 8 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[43] Edison Electric Institute. *Typical Bills and Average Rates Report.* Washington, DC, October 2016.

dry-type) and kVA rating.[44 45] DOE projected these shipments to future years by assuming that annual transformer shipments growth is equal to growth in electricity consumption as given by AEO 2012, and then continuing this rate from 2030 to 2045. DOE assumed that the market share of transformers for each type, and at each capacity, to be constant throughout the analysis period. If DOE initiates an energy conservation standards rulemaking, DOE will consider using a similar approach.[46]

Issue H.1: DOE seeks comment on its approach to estimating current shipments and future sales. Such information may include, but need not be limited to: (i) Data and information on current and historical shipments and market shares of distribution transformers categories discussed in this notice; (ii) data and information on the distribution of shipments (in units) of distribution transformers discussed in this notice by rated capacity, type, BIL, and installation application (pole-mounted, surface pad-mounted, subsurface pad-mounted); and (iii) data and information on how the distribution of shipments of distribution transformers discussed in this notice has changed over time by rated capacity, type, BIL, and installation application (pole-mounted, surface pad-mounted, subsurface pad-mounted).

Issue H.2: DOE requests comment on the approach it intends on using to develop the shipments model and shipments forecasts for distribution transformers under consideration for potential standards.

1. Equipment Lifetimes

The equipment lifetime is the age at which the equipment is retired from service. DOE plans on using the same approach that it used in the April 2013 standards rule, which was based on a report by Oak Ridge National Laboratory.[47] It estimated that the average life of a distribution transformer is 32 years. This lifetime estimate includes a constant failure rate of 0.5 percent/year due to lightning and other random failures unrelated to transformer age, and an additional corrosive failure rate of 0.5 percent/year starting at year 15. 78 FR 23377

Issue H.3: DOE seeks comments on its approach for estimating equipment lifetimes.

2. Purchase Price Elasticity and Refurbished Transformers

DOE recognizes that increase in transformer prices due to changes in standards may cause changes in purchases of new transformers. Due to the essential nature of the utility provided by a distribution transformer, the option to forego purchase, or substitute with other equipment, is very limited. However, because the general trend of utility transformer purchases is determined by increases in generation, utilities could conceivably exercise some discretion in how much transformer stock to buy—the amount of ''over-capacity'' to purchase and hold as reserve stock, and may draw on these reserves instead of purchasing new equipment. In addition, some utilities may choose to refurbish failed transformers and return them to service, rather than purchase a new transformer if the price of the latter increases significantly.

In the April 2013 standards rule, DOE estimated the purchase price elasticity at −0.04 for liquid-immersed transformers, and −0.02 for all dry-type transformers. To capture the negative impact on the national energy saving estimates of replacement refurbished liquid-immersed transformers, DOE assumed that the operational need for a fraction of forgone purchases due to an increase in price would be met with less efficient refurbished equipment. DOE assumed that 20 percent of these foregone purchases would be met by refurbished transformers; and that refurbished transformers would have shorter average lifetimes at 20 years, and an efficiency of 70 percent, of baseline transformers of the same capacity and equipment class.[48] 78 FR 23379.

Issue H.4: DOE requests comment on the purchase price elasticity values of −0.04 and −0.02 for liquid-immersed and dry-type transformers, respectively.

Issue H.5: DOE requests comments on the assumptions regarding consumer response to amended standards made in the April 2013 standards rule, including but not limited to information and data on the fraction and efficiency characteristics of transformers that are refurbished and are returned to service, and whether the decision to use refurbished equipment would vary with equipment capacity, installation application, or other circumstances.

The following tables of the types of data requested for 2018 shipments in can be found in Table II.16 and Table II.17 of this document. Interested parties are also encouraged to provide additional shipment data as may be relevant.

TABLE II.16—SUMMARY TABLE OF SINGLE-PHASE DISTRIBUTION TRANSFORMERS SHIPMENTS-RELATED DATA REQUESTS

[Units Shipped, 2018]

kVA range	Liquid-immersed, medium-voltage	Dry-type, low-voltage	Dry-type, medium-voltage, 20–45 kV BIL	Dry-type, medium-voltage, 46–95 kV BIL	Dry-type, medium-voltage, ≥96 kV BIL
10					
15					
25					
37.5					

[44] Hopkinson, P. & Puri, J. *Distribution Transformer Market Shipment Estimates for 2001.* (HVOLT Consultants Inc.: Washington DC, 2003).

[45] Hopkinson, P. & Puri, J. *Distribution Transformer Market Shipment Estimates for 2009.* (HVOLT Consultants Inc.: Washington DC, 2010).

[46] The market shares for distribution transformers were not presented in the final rule **Federal Register** notice, but can be found on page 9–11 of chapter 9 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[47] Barnes. *Determination Analysis of Energy Conservation Standards for Distribution Transformers.* ORNL–6847. 1996.

[48] A more detailed discussion can be found on page 9–14 of chapter 9 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

TABLE II.16—SUMMARY TABLE OF SINGLE-PHASE DISTRIBUTION TRANSFORMERS SHIPMENTS-RELATED DATA REQUESTS—Continued

[Units Shipped, 2018]

kVA range	Liquid-immersed, medium-voltage	Dry-type, low-voltage	Dry-type, medium-voltage, 20–45 kV BIL	Dry-type, medium-voltage, 46–95 kV BIL	Dry-type, medium-voltage, ≥96 kV BIL
50					
75					
100					
167					
250					
333					
500					
667					
833					

* BIL = basic impulse insulation level.

TABLE II.17—SUMMARY TABLE OF THREE-PHASE DISTRIBUTION TRANSFORMERS SHIPMENTS-RELATED DATA REQUESTS

[Units Shipped, 2018]

kVA range	Liquid-immersed, medium-voltage	Dry-type, low-voltage	Dry-type, medium-voltage, 20–45 kV BIL	Dry-type, medium-voltage, 46–95 kV BIL	Dry-type, medium-voltage, ≥96 kV BIL
15					
30					
45					
75					
112.5					
150					
225					
300					
500					
750					
1000					
1500					
2000					
2500					

* BIL = basic impulse insulation level.

If disaggregated fractions of annual sales are not available at the equipment type level, DOE requests more aggregated fractions of annual sales at the category level.

Issue H.6: If available, DOE requests the same information in Table II.16 and Table II.17 of this document for the previous five years (2013 through 2017).

I. Manufacturer Impact Analysis

The purpose of the manufacturer impact analysis (''MIA'') is to estimate the financial impact of amended energy conservation standards on manufacturers of distribution transformers, and to evaluate the potential impact of such standards on direct employment and manufacturing capacity. The MIA includes both quantitative and qualitative aspects. The quantitative part of the MIA primarily relies on the Government Regulatory Impact Model (''GRIM''), an industry cash-flow model adapted for the equipment in this analysis, with the key output of industry net present value (''INPV''). The qualitative part of the

MIA addresses the potential impacts of energy conservation standards on manufacturing capacity and industry competition, as well as factors such as equipment characteristics, impacts on particular subgroups of firms, and important market and equipment trends.

To account for manufacturers' non-production costs and profit margin, DOE applies a non-production cost multiplier (the manufacturer markup) to the MPC. The resulting MSP is the price at which manufacturers sell their distribution transformers to their first commercial consumer along the distribution chain. For the April 2013 standards rule, DOE used a manufacturer markup of 1.25 for all distribution transformer equipment classes: liquid-immersed, LVDT and MVDT.[49]

Issue I.1: DOE requests feedback on whether a manufacturer markup of 1.25 is appropriate for all distribution transformers.

As part of the MIA, DOE intends to analyze impacts of amended energy conservation standards on subgroups of manufacturers of covered equipment, including small business manufacturers. DOE uses the Small Business Administration's (''SBA'') small business size standards to determine whether manufacturers qualify as small businesses, which are listed by the applicable North American Industry Classification System (''NAICS'') code.[50] Manufacturing of consumer distribution transformers is classified under NAICS 335311, ''Power, Distribution, and Specialty Transformer Manufacturing,'' and the SBA sets a threshold of 750 employees or less for a domestic entity to be considered as a small business. This employee threshold includes all employees in a business' parent company and any other subsidiaries.

One aspect of assessing manufacturer burden involves examining the cumulative impact of multiple DOE standards and the equipment-specific regulatory actions of other Federal agencies that affect the manufacturers of a covered product or equipment. While any one regulation may not impose a significant burden on manufacturers, the combined effects of several existing or impending regulations may have serious consequences for some manufacturers, groups of manufacturers, or an entire industry. Assessing the impact of a single regulation may overlook this cumulative regulatory burden. In addition to energy conservation standards, other regulations can significantly affect manufacturers' financial operations. Multiple regulations affecting the same manufacturer can strain profits and lead companies to abandon product lines or markets with lower expected future returns than competing products. For these reasons, DOE conducts an analysis of cumulative regulatory burden as part of its rulemakings pertaining to appliance efficiency.

Issue I.2: To the extent feasible, DOE seeks the names and contact information of any domestic or foreign-based manufacturers that distribute distribution transformers in the United States.

Issue I.3: DOE requests feedback on the degree to which small businesses perform core manufacturing techniques themselves, such as assembly and mitering, versus choosing to outsource, and the corresponding effect on capital investments required to achieve greater efficiencies. DOE requests specific comment on relative changes in these practices relative to before the April 2013 standards rule.

Issue I.4: DOE identified small businesses as a subgroup of manufacturers that could be disproportionally impacted by amended energy conservation standards. DOE requests the names and contact information of small business manufacturers, as defined by the SBA's size threshold, of distribution transformers that distribute products in the United States. In addition, DOE requests comment on any other manufacturer subgroups that could be disproportionally impacted by amended energy conservation standards. DOE requests feedback on any potential approaches that could be considered to address impacts on manufacturers, including small businesses.

Issue I.5: DOE requests information regarding the cumulative regulatory burden impacts on manufacturers of distribution transformers associated with (1) other DOE standards applying to different products that these manufacturers may also make and (2) equipment-specific regulatory actions of other Federal agencies. DOE also requests comment on its methodology for computing cumulative regulatory burden and whether there are any flexibilities it can consider that would reduce this burden while remaining consistent with the requirements of EPCA.

J. Other Energy Conservation Standards Topics

1. Market Failures

In the field of economics, a market failure is a situation in which the market outcome does not maximize societal welfare. Such an outcome would result in unrealized potential welfare. DOE welcomes comment on any aspect of market failures, especially those in the context of amended energy conservation standards for distribution transformers.

2. Emerging Smart Technology Market

DOE recently published an RFI on the emerging smart technology appliance and equipment market. 83 FR 46886 (Sept. 17, 2018). In that RFI, DOE sought information to better understand market trends and issues in the emerging market for appliances and commercial equipment that incorporate smart technology. DOE's intent in issuing the RFI was to ensure that DOE did not inadvertently impede such innovation in fulfilling its statutory obligations in setting efficiency standards for covered products and equipment. DOE seeks comments, data and information on the issues presented in the RFI as they may be applicable to distribution transformers.

3. Other

In addition to the issues identified earlier in this document, DOE welcomes comment on any other aspect of energy conservation standards for distribution transformers not already addressed by the specific areas identified in this document.

III. Submission of Comments

DOE invites all interested parties to submit in writing by August 2, 2019, comments and information on matters addressed in this document and on other matters relevant to DOE's consideration of amended energy conservations standards for distribution transformers. After the close of the comment period, DOE will review the public comments received and may begin collecting data and conducting the analyses discussed in this RFI.

Submitting comments via *http://www.regulations.gov.* The *http://www.regulations.gov* web page requires you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies Office staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed

[49] Manufacturer markups were not presented in the final rule **Federal Register** notice, but can be found on pages 12–18 through 12–23 of the April 2013 standards rule Technical Support Document, available from: *https://www.regulations.gov/document?D=EERE-2010-BT-STD-0048-0760.*

[50] Available online at *https://www.sba.gov/document/support-table-size-standards.*

properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to *http://www.regulations.gov* information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (''CBI'')). Comments submitted through *http://www.regulations.gov* cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through *http://www.regulations.gov* before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that *www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email, hand delivery/courier, or postal mail. Comments and documents submitted via email, hand delivery/courier, or postal mail also will be posted to *http://www.regulations.gov.* If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. If you submit via postal mail or hand delivery/courier, please provide all items on a CD, if feasible. It is not necessary to submit printed copies. No telefacsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English and free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. 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 via email, postal mail, or hand delivery/courier two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked ''non-confidential'' with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include: (1) A description of the items, (2) whether and why such items are customarily treated as confidential within the industry, (3) whether the information is generally known by or available from other sources, (4) whether the information has previously been made available to others without obligation concerning its confidentiality, (5) an explanation of the competitive injury to the submitting person which would result from public disclosure, (6) when such information might lose its confidential character due to the passage of time, and (7) why disclosure of the information would be contrary to the public interest.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

DOE considers public participation to be a very important part of the process for developing energy conservation standards. DOE actively encourages the participation and interaction of the public during the comment period in each stage of the rulemaking process. Interactions with and between members of the public provide a balanced discussion of the issues and assist DOE in the rulemaking process. Anyone who wishes to be added to the DOE mailing list to receive future notices and information about this process or would like to request a public meeting should contact Appliance and Equipment Standards Program staff at (202) 287–1445 or via email at *ApplianceStandardsQuestions@ee.doe.gov.*

Signed in Washington, DC, on June 11, 2019.

Daniel R. Simmons,

Assistant Secretary, Energy Efficiency and Renewable Energy.

[FR Doc. 2019–12761 Filed 6–17–19; 8:45 am]

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 300

[EPA–HQ–SFUND–1983–0002; FRL–9995–25–Region 9]

National Oil and Hazardous Substances Pollution Contingency Plan; National Priorities List: Deletion of the MGM Brakes Superfund Site

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule; notice of intent.

SUMMARY: The Environmental Protection Agency (EPA) Region 9 is issuing a Notice of Intent to Delete MGM Brakes Superfund Site (Site) located in Cloverdale, Sonoma County, California, from the National Priorities List (NPL) and requests public comments on this proposed action. The NPL, promulgated pursuant to section 105 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, is an appendix of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The EPA and the State of California, through the Department of Toxic Substances Control, have determined that all appropriate response actions under CERCLA have been completed. However, this deletion does not preclude future actions under Superfund.