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DEPARTMENT OF ENERGY

10 CFR Part 431

[EERE-2022-BT-TP-0019]

RIN 1904-AF08

Energy Conservation Program: Test Procedure for Compressors

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

ACTION: Notice of proposed rulemaking and announcement of public meeting.

SUMMARY: The U.S. Department of Energy ("DOE") proposes to amend the test procedure for compressors to correct an error. DOE also proposes to amend the definition of air compressor to include a minor clarification and revise a typographical error. DOE is seeking comment from interested parties on the proposals.

DATES: DOE will accept comments, data, and information regarding this proposal no later than **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. See section V, "Public Participation," for details.

DOE will hold a public meeting via webinar on Wednesday, March 22, 2023, from 1:00 p.m. to 4:00 p.m. See section V, "Public Participation," for webinar registration information, participant instructions, and information about the capabilities available to webinar participants.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *www.regulations.gov* under docket number EERE-2022-BT-TP-0019. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE-2022-BT-TP-0019, by any of the following methods:

Email: *Compressors2022TP0019@ee.doe.gov*. Include the docket number EERE-2022-BT-TP-0019 in the subject line of the message.

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.

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 telefacsimiles ("faxes") will be accepted. For detailed instructions on submitting comments and additional information on this process, see section V of this document.

Docket: The docket for this activity, which includes *Federal Register* notices, public meeting attendee lists and transcripts (if a public meeting is held), comments, and other supporting documents/materials, is available for review at *www.regulations.gov*. All documents in the docket are listed in the *www.regulations.gov* index. However, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

The docket webpage can be found at *www.regulations.gov/docket/EERE-2022-BT-TP-0019*. The docket webpage contains instructions on how to access all documents, including public comments, in the docket. See section V for information on how to submit comments through *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*.

Mr. Pete Cochran, U.S. Department of Energy, Office of the General Counsel, GC-33, 1000 Independence Avenue SW, Washington, DC 20585-0121. Telephone: (202) 586-9496. Email: *peter.cochran@hq.doe.gov*.

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

SUPPLEMENTARY INFORMATION:

DOE proposes to maintain the previously approved incorporation by reference of the testing methods contained in the following commercial standards into 10 CFR part 431:

ISO 1217:2009(E), "Displacement compressors—Acceptance tests," July 1, 2009, sections 2, 3, and 4; sections 5.2, 5.3, 5.4, 5.6, 5.9; paragraphs 6.2(g), and 6.2(h) including Table 1; Annex C (excluding C.1.2, C.2.1, C.3, C.4.2.2, C.4.3.1, and C.4.5). ISO 1217:2009/Amd.1:2016(E), Displacement compressors—Acceptance tests (Fourth edition); Amendment 1: "Calculation of isentropic efficiency and relationship with specific energy," April 15, 2016, sections 3.5.1 and 3.6.1; sections H.2 and H.3 of Annex H.

Copies of ISO 1217:2009(E) and of ISO 1217:2009/Amendment 1:2016(E) may be purchased from ISO at Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland +41 22 749 01 11, or by going to www.iso.org.

See section IV.M of this document for additional information about ISO 1217:2009(E) and ISO 1217:2009/Amendment 1:2016(E).

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VI. Approval of the Office of the Secretary

I. Authority and Background

A. Authority

The Energy Policy and Conservation Act, Pub. L. 94-163, as amended ("EPCA"),[1] 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 of EPCA[1], added by Pub. L. 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. Under EPCA, DOE may include a type of industrial equipment, including compressors, as covered equipment if it determines that doing so is necessary to carry out the purposes of Part A-1. (42 U.S.C. 6311(1)(L), 6311(2)(B)(i), and 6312(b)). The purpose of Part A-1 is to improve the efficiency of electric motors and pumps and certain other industrial equipment to conserve the energy resources of the Nation. (42 U.S.C. 6312(a)). On November 15, 2016, DOE published a final rule, which determined that coverage for compressors is necessary to carry out the purposes of Part A-1 of Title III of EPCA. 81 FR 79991.

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), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), energy conservation standards (42 U.S.C. 6313), and the authority to require information and reports from manufacturers (42 U.S.C. 6316; 42 U.S.C. 6296).

[1] All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Pub. L. 116-260 (Dec. 27, 2020), which reflect the last statutory amendments that impact Parts A and A-1 of EPCA.

The Federal testing requirements consist of test procedures that manufacturers of covered equipment must use as the basis for: (1) certifying to DOE that their equipment complies with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6316(a); 42 U.S.C. 6295(s)), and (2) making other representations about the efficiency of that equipment (42 U.S.C. 6314(d)). Similarly, DOE must use these test procedures to determine whether the equipment complies with relevant standards promulgated under EPCA. (42 U.S.C. 6316(a); 42 U.S.C. 6295(s)).

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 42 U.S.C. 6316(b); 42 U.S.C. 6297). DOE may, however, grant waivers of Federal preemption for particular State laws or regulations, in accordance with the procedures and other provisions of EPCA. (42 U.S.C. 6316(a); 42 U.S.C. 6297)

Under 42 U.S.C. 6314, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered equipment. EPCA requires that any test procedures prescribed or amended under this section must be reasonably designed to produce test results which reflect energy efficiency, energy use, and estimated annual operating cost of a given type of covered equipment during a representative average use cycle and requires that test procedures not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)-(3))

EPCA also requires that, at least once every 7 years, DOE evaluate test procedures for each type of covered equipment, including compressors, to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures to not be unduly burdensome to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and

estimated operating costs during a representative average use cycle. (42 U.S.C. 6314(a)(1))

In addition, if the Secretary determines that a test procedure amendment is warranted, the Secretary must publish a proposed test procedure in the *Federal Register* and afford interested persons an opportunity (of not less than 45 days' duration) to present oral and written data, views, and arguments on the proposed test procedure. (42 U.S.C. 6314(b)) If DOE determines that test procedure revisions are not appropriate, DOE must publish its determination not to amend the test procedure. (42 U.S.C. 6314(a)(1)(A)(ii))

DOE is publishing this notice of proposed rulemaking ("NOPR") in satisfaction of the 7-year review requirement specified in EPCA. (42 U.S.C. 6314(a)(1)(A)(ii))

B. Background

DOE's existing test procedure for compressors appears at Title 10 of the Code of Federal Regulations (CFR) part 431, subpart T, appendix A ("Uniform Test Method for Certain Air Compressors").

As stated, DOE published a final rule on November 15, 2016, in which DOE determined that coverage of compressors is necessary to carry out the purposes of Part A-1 of Title III of EPCA. 81 FR 79991. DOE's test procedure for determining compressor energy efficiency of certain varieties of compressors was established in a final rule published on January 4, 2017 (hereafter, the "January 2017 Final Rule"). 82 FR 1052.

On May 17, 2019, DOE published a notice of petition for rulemaking and request for comment regarding the test procedure for compressors in response to a petition from Atlas Copco North America ("Atlas Copco"). 84 FR 22395. Atlas Copco's petition was received on April 17, 2019 and requested that DOE amend the compressors test procedure to specify that manufacturers could satisfy the test procedure requirements by using the industry test method for rotary air compressor energy efficiency, ISO

1217:2009. In the notice of petition for rulemaking, DOE sought comment regarding the petition as to whether to proceed with the petition, but took no position at the time regarding the merits of the suggested rulemaking or the assertions made by Atlas Copco. 84 FR 22395.[2]

On January 10, 2020, DOE published a final rule for energy conservation standards for air compressors (hereafter, the "January 2020 ECS Final Rule"). 85 FR 1504. Compliance with the energy conservation standards established in the January 2020 ECS Final Rule is required for compressors manufactured starting on January 10, 2025. 10 CFR 431.345.

On May 6, 2022, DOE issued a Request for Information ("RFI") for a test procedure for compressors to consider whether to amend DOE's test procedure for compressors (hereafter, the "May 2022 RFI"). 87 FR 27025. To inform interested parties and to facilitate this process, DOE identified certain issues associated with the currently applicable test procedure on which DOE is interested in receiving comment. On June 6, 2022, DOE granted a 14-day extension to the public comment period, allowing comments to be submitted until June 20, 2022. 87 FR 34220.

In general, representations of compressor performance must be in accordance with the DOE test procedure. (42 U.S.C. 6314(d)). However, DOE guidance (issued Dec. 6, 2017; revised Jun. 8, 2018) stated that it would discretionarily not enforce this requirement until compliance with a standard is required or a labeling requirement is established. On May 2, 2022, DOE announced that it was suspending the enforcement policy regarding the test procedure for air compressors and removed the policy from the DOE enforcement website.

[2] Associated documents are available in the rulemaking docket at *www.regulations.gov/docket? D=EERE–2019–BT–PET–0017*.

Following retraction of the enforcement policy and to aid manufacturers in understanding DOE's regulatory requirements regarding the test procedure and forthcoming energy conservation standards, DOE held a "Compressors Regulations 101" webinar on May 24, 2022. The webinar reviewed testing, rating, certification, and compliance responsibilities.[3]

DOE received comments in response to the May 2022 RFI from the interested parties listed in Table I.1.

Table I.1 List of Commenters with Written Submissions in Response to the May 2022 RFI

Commenter(s)	Reference in this NOPR	Comment No. in the Docket	Commenter Type
Saylor-Beall Air Compressors	Saylor-Beall	2	Manufacturer
Compressed Air & Gas Institute	CAGI	3, 11	Trade Association
Jenny Products Inc.	Jenny Products	4	Manufacturer
Pacific Gas and Electric Company, San Diego Gas and Electric, Southern California Edison	CA IOU's	5, 14	Utility Companies
Northwest Energy Efficiency Alliance	NEEA	5, 16	Efficiency Organization
CASTAIR Inc.	CASTAIR	6	Manufacturer
The People's Republic of China	People's Republic of China	8	Foreign Government
Compressed Air Systems	Compressed Air Systems	10	Manufacturer
Appliance Standard Awareness Project, American Council for an Energy-Efficient Economy, Natural Resources Defense Council, and New York State Energy Research and Development Authority	ASAP, ACEEE, NRDC, and NYSERDA	12	Efficiency Organizations
Ingersoll Rand	Ingersoll Rand	13	Manufacturer
Northwest Power and Conservation Council	NPCC	16	Efficiency Organization
Kaeser Compressors	Kaeser Compressors	17	Manufacturer

[3] The slide material presented during the webinar has been published on DOE's website: *www.energy.gov/sites/default/files/2022-05/compressors-101.pdf*.

A parenthetical reference at the end of a comment quotation or paraphrase provides the location of the item in the public record.[4]

II. Synopsis of the Notice of Proposed Rulemaking

In this NOPR, DOE proposes to amend subpart T of title 10 of the Code of Federal Regulations, part 431 (10 CFR part 431), which contains definitions, materials incorporated by reference, and the test procedure for determining the energy efficiency of certain varieties of compressors as follows:

1. Revise the formula for pressure ratio at full-load operating pressure currently in 10 CFR part 431, subpart T to correct a typographical error, and
2. Modify the current definition of "air compressor" to clarify that compressors with more than one compression element are still within the scope of this test procedure, and to revise the typographical error of "compressor element" to "compression elements."

DOE's proposed actions are summarized in Table II.1 compared to the current test procedure as well as the reason for the proposed change.

Table II.1 Summary of Changes in Proposed Test Procedure Relative to Current Test Procedure

Current DOE Test Procedure	Proposed Test Procedure	Attribution
Pressure ratio at full-load operating pressure formula in 10 CFR part 431, subpart T contains an error, as the wrong formula is presented	Correct the pressure ratio at full-load operating pressure formula in 10 CFR part 431, subpart T	Error Correction
Air Compressor Definition: A compressor designed to compress air that has an inlet open to the atmosphere or other source of air, and is made up of a compression element (bare compressor), driver(s), mechanical equipment to drive the compressor element, and any ancillary equipment	Air Compressor Definition: A compressor designed to compress air that has an inlet open to the atmosphere or other source of air, and is made up of **one or more compression elements (bare compressors)**, driver(s), mechanical equipment to drive the	Clarification

[4] The parenthetical reference provides a reference for information located in the docket of DOE's rulemaking to develop test procedures for compressors. (Docket No. EERE-2022-BT-TP-0019, which is maintained at *www.regulations.gov.*) The references are arranged as follows: (commenter name, comment docket ID number, page of that document).

Current DOE Test Procedure	Proposed Test Procedure	Attribution
	compression elements, and any ancillary equipment	

DOE has tentatively determined that the proposed amendments described in section III of this NOPR would more accurately or fully comply with the requirements that test procedures be reasonably designed to produce test results which reflect energy use during a representative average use cycle and are not unduly burdensome to conduct. (42 U.S.C. 6314(a)(1)) DOE has also tentatively determined that these proposed amendments, if made final, would not alter the measured efficiency of compressors, require retesting or recertification, or alter the cost of testing. Discussion of DOE's proposed actions and discussion of additional topics raised in or in response to the May 2022 RFI are included in section III of this NOPR.

III. Discussion

In the following sections, DOE proposes certain amendments to its test procedure for compressors. For each proposed amendment, DOE provides relevant background information, explains why the amendment merits consideration, discusses relevant public comments, and proposes a potential approach.

A. Scope of Applicability

DOE's test procedure applies to a compressor that meets all of the following criteria: is an air compressor; is a rotary compressor; is not a liquid ring compressor; is driven by a brushless electric motor; is a lubricated compressor; has a full-load operating pressure of 75-200 psig; is not designed and tested to the requirements of the American Petroleum Institute Standard 619; has full-load actual volume flow rate greater than or equal to 35 cubic feet per minute (cfm), or is distributed in commerce with a compressor motor nominal horsepower greater than or equal to 10 horsepower (hp); and has a full-

load actual volume flow rate less than or equal to 1,250 cfm, or is distributed in commerce with a compressor motor nominal horsepower less than or equal to 200 hp. 10 CFR 431.344.

DOE received comments both supporting and opposing scope changes. CAGI, supported by Kaeser Compressors, stated that the current scope is adequate and supported maintaining the current scope of the Test Procedure. (CAGI, No. 11 at p. 1; Kaeser Compressors, No. 17 at p. 1) Ingersoll Rand commented that no changes or developments in the industry or to usage patterns of air compressors would warrant changing the scope, and recommended that the current scope be re-affirmed. (Ingersoll Rand, No. 13 at p. 1) ASAP, ACEEE, NRDC, and NYSERDA, on the other hand, encouraged DOE to consider expanding the scope of the test procedure to include additional air compressor types. (ASAP, ACEEE, NRDC, and NYSERDA, No. 12 at p. 1)

As discussed in more detail in the following sections, DOE is not proposing changes to the scope of test procedures as there is uncertainty around whether the test procedure would produce representative results for these additional compressor types. OE may consider test procedure scope expansion, including related comments discussed in this NOPR, in a future test procedure rulemaking.

DOE responds to specific scope expansion topics in sections III.A.1 through III.A.7 of this NOPR.

1. Reciprocating Compressors

As stated in section III.A of this document, the current test procedure for compressors applies to rotary compressors (and therefore does not apply to reciprocating compressors). 10 CFR 431.344. In response to the May 2022 RFI, DOE received

comments regarding the continued exclusion of reciprocating air compressors from the scope of the test procedure pertaining to compressors.

Several parties commented in support of maintaining the test procedure scope with respect to reciprocating compressors. Saylor-Beall stated that reciprocating air compressors should remain out of scope and should not be tested using the current test procedure because operating a reciprocating compressor at full load increases its heat above what would be expected in normal intermittent use, causing reduced air flow, leading to potentially understated efficiency measurements in normal operation, which could lead to erroneous judgements. (Saylor-Beall, No. 2 at p. 1-2) Jenny Products commented that reciprocating compressors will require a completely different set of test criteria and procedures, are inherently different from rotary compressors, and that any attempt to apply isentropic efficiency standards to reciprocating compressors will result in highly inaccurate results. (Jenny Products, No. 4 at p. 1-2) CASTAIR commented that it would not make sense to apply an efficiency test using a continuous duty cycle when most reciprocating compressors are meant for intermittent duty. CASTAIR also mentioned that requiring reciprocating compressors to use the current DOE test procedure would inevitably force customers into machines that do not accurately fit their applications, resulting in an overall efficiency decrease. (CASTAIR, No. 6 at p. 1-2) Compressed Air Systems commented that that there is no industry support for applying the current DOE test procedure to reciprocating air compressors, and that this test procedure is not appropriate nor effective for evaluating reciprocating air compressors. (Compressed Air Systems, No. 10 at p. 5)

Conversely, NEEA and NPCC commented that reciprocating air compressors should be included in the scope of this test procedure rulemaking. NEEA and NPCC stated that the ISO 1217:2009 standard includes both rotary and reciprocating

compressors, and by not including reciprocating compressors, DOE is overlooking an opportunity to gather data on the most common compressor type. NEEA and NPCC also mentioned that there is notable energy savings potential in regulating reciprocating air compressors. (NEEA and NPCC, No. 16 at p. 2-3)

At this time, DOE is not proposing to expand the scope of the test procedure to include reciprocating compressors. DOE will continue reviewing potential test procedures for reciprocating compressors, including existing test methods, and may consider expanding the scope of the test procedure to include these compressors in a future test procedure rulemaking.

DOE seeks comment regarding its proposal to not include reciprocating compressors within the scope of test procedure applicability.

See section V.E of this document for a list of issues on which DOE seeks comment.

2. Centrifugal Compressors

As stated in section III.A of this document, the current test procedure for compressors applies to rotary compressors (and therefore does not apply to centrifugal air compressors). 10 CFR 431.344. In response to the May 2022 RFI, DOE received comments regarding centrifugal compressors.

In a joint comment, ASAP, ACEEE, NRDC, and NYSERDA encouraged DOE to consider expanding the scope of the test procedure to include centrifugal compressors, because such inclusion would ensure that purchasers have access to consistent information about compressor efficiency. (ASAP, ACEEE, NRDC, and NYSERDA, No. 12 at p. 1-2) The CA IOU's also encouraged DOE to evaluate expanding the scope of the test procedure to cover centrifugal air compressors, and to evaluate their suitability when incorporated into the uniform test method. (CA IOU's, No. 14 at p. 6-7)

The CA IOU's encouraged DOE to evaluate expanding the scope of the test procedure to cover centrifugal air compressors, and to evaluate their suitability when incorporated into the uniform test method. (CA IOU's, No. 14 at p. 6-7).

At this time, DOE is not proposing to expand the scope of the test procedure to include centrifugal compressors. DOE continues to review and consider potential test methods for centrifugal compressors and may consider developing test procedures for centrifugal compressors as part of a future rulemaking process.

DOE seeks comment regarding its proposal not to include centrifugal compressors within the scope of test procedure applicability.

DOE seeks comment regarding whether other dynamic compressor varieties than centrifugal compete with the air compressor categories discussed in this NOPR.

See section V.E of this document for a list of issues on which DOE seeks comment.

3. Compressor Motor Nominal Horsepower

As stated in section III.A of this document, the current test procedure for compressors applies to compressors that have a full-load operating pressure of between 75 to 200 psig (inclusive) and either (1) a full-load actual volume flow rate of between 35 cfm and 1,250 cfm (inclusive) or (2) compressor motor nominal horsepower of between 10 hp and 200 hp. 10 CFR 431.344.

Because compressor full-load actual volume flow rate scales (approximately) linearly with compressor motor nominal horsepower and (approximately) inversely with full-load operating pressure, the compressor motor nominal horsepower at which the upper flow-based limit of 1,250 cfm would be reached is a function of output pressure. Specifically, 1,250 cfm would include all of the applicable compressor market within the

scope of the compressors test procedure at all but the lower end of the pressure-based range (*i.e.*, 75 psig).

ASAP, ACEEE, NRDC, and NYSERDA also stated that DOE should consider expanding the scope of the test procedure to include compressors greater than 200 HP, because this additional category represents a significant portion of the market (ASAP, ACEEE, NRDC, and NYSERDA, No. 12 at p. 1-2). The CA IOU's also encouraged DOE to evaluate expanding the scope of the Test Procedure to cover rotary lubricated models up to 500 HP. They presented a table mentioning that the range of 201 hp to 500 hp contributes to 25 percent of total air compressor energy consumption (CA IOU's, No. 14 at p. 6-7).

Because of the direct mathematical relationship between the three values in question (*i.e.,* output pressure, output flow, motor power), changing one would likely require changing at least one other. Although not explicitly stated, DOE interprets the comments supporting a change in the motor-based capacity scope threshold to also be implicitly supporting a corresponding adjustment to either the flow- or pressure-based capacity limits.

In the January 2017 Final Rule, DOE stated that the representations, sampling, and enforcement provisions required by the test procedure may cause significant burden for compressors greater than 200 hp, as many of the larger horsepower models are custom or infrequently built and typically not available for testing. 82 FR 1052, 1061. Additionally, DOE stated that the proposed inclusion of larger (greater than 200 hp) rotary compressors could create a competitive disadvantage for manufacturers of these compressors, as centrifugal, reciprocating, and scroll compressors of the same horsepower do not have the same testing and representation requirements. 82 FR 1052, 1061-1062. DOE concluded that this competitive advantage could incentivize users to

switch from a regulated (rotary) to an unregulated (centrifugal and reciprocating) compressor, thus creating an unfair and undue burden on certain manufacturers. 82 FR 1052, 1062. Finally, DOE concluded that the burden of testing certain larger compressors outweighs the benefits. 82 FR 1052, 1062.

DOE has tentatively determined that the same burden concerns as discussed in the January 2017 Final Rule would continue to exist for the current compressor market. Therefore, DOE is not proposing any changes to the current horsepower range of 10 to 200 hp for the existing test procedure.

DOE seeks comment regarding its initial determination to not include compressors with a horsepower rating above 200 hp within the scope of test procedure applicability.

See section V.E for a list of issues on which DOE seeks comment.

4. Lubricant-Free Compressors

As stated in section III.A of this document, the current test procedure for compressors applies to lubricated compressors (and therefore does not apply to lubricant-free compressors). 10 CFR 431.344. In response to the May 2022 RFI, DOE received comments regarding lubricant-free compressors.

ASAP, ACEEE, NRDC, and NYSERDA encouraged DOE to consider expanding the scope of the test procedure to include lubricant-free compressors, citing that these compressors represent a significant portion of the market. (ASAP, ACEEE, NRDC, and NYSERDA, No. 12 at p. 1-2)

At this time, DOE is not proposing to expand the scope of the test procedure to include lubricant-free compressors. DOE discussed lubricant-free compressors in both the January 2017 Final Rule (82 FR 1052 at 1063) and the January 2020 ECS Final Rule (85 FR 1504 at 1519-1520), concluding that justification did not exist at the time to support

extending the scope of either test procedures or energy conservation standards to apply to lubricant-free compressors. DOE has tentatively determined that the conclusion made in the 2017 and 2020 final rules still applies for lubricant-free compressors. DOE may evaluate the justification for developing test procedures for lubricant-free compressors as part of a future rulemaking process.

DOE seeks comment regarding its proposal to not include lubricant-free compressors within the scope of test procedure applicability.

See section V.E for a list of issues on which DOE seeks comment.

5. Compressors with Brushed Motors

As stated in section III.A, the current test procedure for compressors applies only to compressors with brushless motors. 10 CFR 431.344. In response to the May 2022 RFI, DOE received comments regarding compressors with brushed motors.

ASAP, ACEEE, NRDC, and NYSERDA encourage DOE to consider expanding the scope of the test procedure to include compressors with brushed motors, citing that these compressors represent a significant portion of the market (ASAP, ACEEE, NRDC, and NYSERDA, No. 12 at p. 1-2).

At this time, DOE is not proposing to expand the scope of the test procedure to include compressors with brushed motors. DOE discussed compressors with brushed motors in both the January 2017 Final Rule (82 FR 1052 at 1060) and the January 2020 ECS Final Rule (85 FR 1504 at 1515), concluding that justification did not exist at the time to support extending the scope of either test procedures or energy conservation standards to apply to compressors with brushed motors. DOE has tentatively determined that the conclusion made in the 2017 and 2020 final rules still applies for compressors with brushed motors. DOE may evaluate the justification for developing test procedures for compressors with brushed motors as part of a future rulemaking process.

DOE seeks comment regarding its proposal to not include compressors with brushed motors within the scope of test procedure applicability.

See section V.E of this document for a list of issues on which DOE seeks comment.

6. Medium-Voltage Compressors

As stated in section III.A, the current test procedure for compressors does not restrict applicability by electrical input power voltage. 10 CFR 431.344. In response to the May 2022 RFI, DOE received comments regarding medium-voltage compressors.

The CA IOU's encouraged DOE to evaluate the current exemption for medium-voltage compressors based on electrical input power load profiles for air compressors ranging in size from 300 to 600 HP that they present. The CA IOUs stated that, in the context of the comment, "medium-voltage" refers to input voltages greater than 1,000 and that the specific data upon which their comment is based contains medium-voltage compressors of input voltage range 2,300-4,160. (CA IOU's, No. 14 at p. 4) They commented that, if medium-voltage compressors were included, their presented electrical input power load distribution would be more uniform. The CA IOUs stated that, if medium-voltage compressors were rated, load-unload behavior would be significant for understanding the product operation in some specific installations, while full-load would be suitable for others. (CA IOU's, No. 14 at p. 5) The CA IOU's encouraged DOE to evaluate expanding the scope of the test procedure to cover rotary lubricated models up to 500 HP, and to evaluate their suitability when incorporated into the uniform test method. The CA IOUs presented a table illustrating that the compressors of motor power in the range of 201-500 HP account for 25 percent of total air compressor energy consumption (CA IOU's, No. 14 at p. 6-7).

The current test procedure scope of applicability is not limited by voltage. 10 CFR 431.344. DOE recognizes the potential correlation between motor input voltage and

motor output power, and may consider the two factors jointly if weighing the consequences of expanding the scope of test procedure applicability by compressors nominal motor horsepower.

See section V.E of this document for a list of issues on which DOE seeks comment.

7. Compressors With Output Pressure Less Than 75 psig

As stated in section III.A, the current test procedure for compressors applies only to rotary compressors, a category which excludes all varieties of dynamic compressors, of which centrifugal compressors are a member. 10 CFR 431.344. In response to the May 2022 RFI, DOE received comments regarding centrifugal blowers and equipment of output pressure of less than 75 psig, which would generally include what are commonly referred to as centrifugal blowers.

The CA IOU's encouraged DOE to develop test procedures for centrifugal blowers and positive-displacement equipment, and to consider air applications for pressures under 75 psig (CA IOU's, No. 14 at p. 8).

At this time, DOE is not proposing to expand the scope of the test procedure to include compressors with output pressure of less than 75 psig. DOE discussed compressors with output pressure of less than 75 psig in both the January 2017 Final Rule (82 FR 1052 at 1062-1063) and the January 2020 ECS Final Rule (85 FR 1504 at 1519), concluding that justification did not exist at the time to support extending the scope of either test procedures or energy conservation standards to apply to compressors with output pressure of less than 75 psig. DOE has tentatively determined that the conclusion made in the 2017 and 2020 final rules still applies for compressors with output pressure of less than 75 psig. DOE may evaluate the justification for developing test procedures

for compressors with output pressure of less than 75 psig as part of a future rulemaking process.

DOE seeks comment regarding its proposal to not include equipment for compressed air applications for pressures under 75 psig within the scope of test procedure applicability.

See section V.E of this document for a list of issues on which DOE seeks comment.

B. Industry Standards

1. ISO 1217 as the Basis for this Test Procedure

DOE's current test procedure incorporates by reference certain sections of ISO 1217:2009 for test methods and acceptance tests regarding volume rate of flow and power requirements of displacement compressors, in addition to the operating and testing conditions which apply when a full performance test is specified.

DOE received comments supporting the continued use of ISO 1217 as the basis for the DOE air compressor test procedure. CAGI, supported by Kaeser Compressors, commented that they support maintaining ISO 1217 as the basis for the compressor test procedure, since this standard has been used by industry for decades and is a proven means of accurately measuring positive displacement compressor performance. (CAGI, No. 11 at p. 3; Kaeser Compressors, No. 17 at p. 1) Similarly, Ingersoll Rand commented that they are satisfied with continuing to use ISO 1217:2009 and ISO 1217 Amendment 1:2016 as the basis of the compressors test procedure. They stated that there is no current work to revise ISO 1217 and it remains current as the adopted national standard in the United States. (Ingersoll Rand, No. 13 at p. 2)

DOE tentatively agrees with the comments received and is not proposing any amendments to the existing reference to ISO 1217:2009(E) as amended through Amendment 1:2016 as the basis for the compressors test procedure.

DOE seeks comment regarding its initial determination to continue to use ISO 1217:2009(E) as amended through Amendment 1:2016 as the basis for the compressors test procedure.

See section V.E for a list of issues on which DOE seeks comment.

2. Ambient Temperature Range Requirement

DOE adopted the ambient temperature range for testing of 68 to 90 °F in the January 2017 Final Rule partially in response to concern that creating a climate-controlled space for testing compressors could be a significant burden on small businesses. DOE stated that this temperature range provides representative measurements without unduly burdening manufacturers. 82 FR 1052, 1079, 1080. DOE received a comment about re-defining the range of ambient temperatures for measured isentropic efficiency values. The People's Republic of China commented that ISO 1217:2009 does not specify a specific ambient temperature range for testing, but only the ambient temperature tolerance (± 2K). The People's Republic of China stated that the wide range of ambient temperature specified by the standard inevitably leads to a wider range of fluctuations in test results. The People's Republic of China proposed that DOE re-define the range of tolerances for measured energy efficiency values to avoid obstacles to trade. (People's Republic of China, No. 8 at p. 3)

The energy efficiency metric for compressors, package isentropic efficiency, expresses tested compressor power consumption as a ratio and relative to that of an ideal isentropic compression at a given load point. ISO 1217:2009/Amd.1:2016(E) includes a derivation of an expression for isentropic power, which is incorporated by reference at 10 CFR 431.343(b)(2). The resulting expression, labeled (H.6) is a function of inlet pressure,

discharge pressure, and volume flow rate, but not inlet temperature, indicating invariance. This invariance alone does not establish that a real compressor under test would be similarly insensitive to temperature. However, it does illustrate that the compression process, itself, does not inherently depend on inlet temperature. Additionally, ISO 1217:2009, which is the industry accepted test method, does not specify a required ambient temperature range for testing

DOE received comments related to inlet (or ambient) temperature in the January 2017 Final Rule, which are discussed therein. 82 FR 1052, 1080. In that discussion, DOE notes that no commenters provided data characterizing the effect of inlet temperature on measured compressor performance. Similarly, the People's Republic of China has not provided such data. DOE has not obtained such data from other sources. As a result, DOE is not able to evaluate the magnitude of the effect of inlet temperature on measured compressor performance and weigh the potential challenges of narrowing the permitted temperature range against the corresponding improvement in test procedure repeatability. Consequently, DOE is not proposing to amend the current ambient temperature range requirement of 68 to 90 °F for testing air compressors in this NOPR.

DOE seeks comment regarding its proposal to maintain the current ambient temperature range requirement of 68-90 °F for testing air compressors.

DOE seeks comment regarding its proposal to continue to use the tolerances for measured energy efficiency values specified in ISO 1217:2009(E).

See section V.E for a list of issues on which DOE seeks comment.

C. Definitions

1. General

DOE defines terms in 10 CFR 431.342 that identify and describe various varieties of compressors and their components, various values that would be measured when conducting the test procedure, and general compressor terminology.

In response to the May 2022 RFI, DOE received multiple comments supporting the current definitions. CAGI, supported by Kaeser Compressors, commented in support of keeping the current definitions as they are, saying that they sufficiently identify the scope equipment and need no further clarification. (CAGI, No. 11 at p. 2; Kaeser Compressors, No. 17 at p. 1) Ingersoll Rand commented that the current definitions related to the scope of the test procedure are sufficient and do not need to be changed. (Ingersoll Rand, No. 13 at p. 1)

DOE has initially determined that the existing definitions in 10 CFR 431.342 are appropriate for applying the test procedure for air compressors and is not proposing to amend the existing definitions, except for the definition of "air compressor" as discussed in the following section.

2. Multi-Element Air Compressors

Air compressors may include multiple compression elements to increase compression efficiency or to generate a greater pressure increase than would be possible with a single compression element. The current definition of "air compressor" specifies inclusion of a compression element, but does not exclude air compressors that include more than one compression element.

DOE discussed the current definition of "air compressor" as applying to multi-element air compressors in both the January 2017 Final Rule (82 FR 1052, 1068) and in the January 2020 ECS Final Rule, in which multi-staging was identified as a technology option for improving the energy efficiency of compressors. 85 FR 1504, 1537.

In response to the May 2022 RFI, DOE received one comment recommending changes to the definition of "air compressor." Specifically, the People's Republic of China recommended revising the definition of "air compressor" to a compressor designed to compress air that has an inlet open to the atmosphere or other source of air, and is made up of one or more compression elements (bare compressors), driver(s), mechanical

equipment to drive the compressor element, and any ancillary equipment. (People's Republic of China, No. 8 at p. 3). In other words, the People's Republic of China recommends making explicit that compressors with more than one compression element would meet the definition of "air compressor".

DOE tentatively concurs with the People's Republic of China that revising the definition of "air compressor" to explicitly include air compressors with more than one compression element would reduce the probability that the definition is misinterpreted to exclude air compressors with more than one compression element. The current formulation of the definition of air compressor does not exclude air compressors with more than one compression element; nonetheless, stating expressly that multi-element compressors meet the definition of "air compressor" limits the potential for misinterpretation. Accordingly, DOE proposes to amend the definition of "air compressor" such that "compression element (bare compressor)" is replaced by "one or more compression elements (bare compressors)."

DOE additionally identified a typographical error in the definition of "air compressor." Specifically, the current definition of "air compressor" includes "compressor element" where it should instead have referred to "compression element." This can be logically inferred by examining other uses of "compression element" in the regulations. For example, the term "rotor", which is a particular variety of compression element, is defined at 10 CFR 431.342 as a compression element that rotates continually in a single direction about a single shaft or axis.

Accordingly, to correct a typographical error in the definition of "air compressor," DOE proposes to substitute "compression element" for "compressor element" therein.

The complete definition of "air compressor" as proposed in this NOPR is "a compressor designed to compress air that has an inlet open to the atmosphere or other source of air, and is made up of one or more compression elements (bare compressors),

driver(s), mechanical equipment to drive the compression elements, and any ancillary equipment.

DOE seeks comment regarding its proposed amendment of the definition of "air compressor."

See section V.E of this document for a list of issues on which DOE seeks comment.

3. Air Compressor Package

A compressor package may include a variety of components which provide differing functions as required by a specific application. In response to the May 2022 RFI, Compressed Air Systems commented that the elements of an air compressor package are not defined, leaving the test procedure unusable. In addition, Compressed Air Systems stated that there is no measure to gauge the differences between different air compressor package designs, and there is confusion on how DOE will measure package efficiency with components aside from the compressor pump and electric motor. (Compressed Air Systems, No. 10 at p. 2, 4) Compressed Air Systems also commented that it is not clear how the test procedure would factor in different drivers that can be used to compress air, as well as what types of drivers are included in the scope of the test procedure NOPR (Compressed Air Systems, No. 10 at p. 2, 3). Compressed Air Systems states that the test procedure is unusable because elements of an air compressor package are not defined. Conversely, Ingersoll Rand, and CAGI, supported by Kaeser Compressors all stated that the existing definitions language is sufficiently clear, as discussed in section III.C.1 of this document.

In response to Compressed Air Systems' statement, Table 1 and Table 2 of appendix A to subpart T of part 431 respectively list equipment required during test (in any case) and equipment required during test if the equipment is distributed in commerce with the basic model. The elements of each list are components of an air compressor

package, which DOE assumes to be sufficiently clear absent specific description of an ambiguity. Accordingly, DOE is not proposing a definition of "air compressor package" in this NOPR.

With regards to Compressed Air System's concerns about there being confusion on how DOE will measure package efficiency with components aside from the compressor pump and the electric motor, DOE's metric is package isentropic efficiency, which characterizes the ratio of the ideal isentropic power required for compression to the actual packaged compressor power input used for the same compression process. Table 1 of appendix A to subpart T of part 431 lists the equipment that must be present and installed for all tests. Similarly, Table 2 of appendix A to subpart T of part 431, lists equipment required during testing if distributed in commerce with the basic model. DOE has initially concluded that these metrics continue to provide a representative measurement of the energy performance of a rated compressor under an average cycle of use.

Finally, regarding the Compressed Air Systems comment pertaining to different drivers that can be used to compress air, DOE has considered different drivers for air compressors, such as engine-driven compressors, and has concluded that they would be more appropriately addressed as part of a separate rulemaking specifically considering such equipment. As a result, DOE is not proposing to update the scope of this compressors test procedure NOPR to include different types of drivers for air compressors. Only compressors driven by brushless electric motors, as stated in the scope of applicability of the current test procedure, will be subject to the air compressors test procedure.

DOE seeks comment regarding its initial determination to continue to limit the scope of applicability of this test procedure to compressors driven by brushless electric motors.

See section V.E of this document for a list of issues on which DOE seeks comment.

D. Test Method

1. K6 Correction Factor

The K_6 correction factor in ISO 1217:2009 is the correction factor for the isentropic exponent (ratio of specific heats) of air (see section 4.1 of ISO 1217:2009). DOE received comments about potentially needing to use the K_6 correction factor in certain situations. CAGI, supported by Kaeser Compressors, commented that if testing is conducted at sites significantly above sea level, DOE may need to use a K_6 correction factor that was omitted from the test procedure to obtain accurate results. They also commented that the measurements taken as a result of the DOE test procedure, and ISO 1217, are the most accurate data that can be obtained practically, as the use of onsite flowmeters or similar equipment without standardized methodologies does not provide a consistent, accurate means of determining performance or energy use. (CAGI, No. 11 at p. 2; Kaeser Compressors, No. 17 at p. 1).

DOE deliberately omitted the K_6 correction factor during the January 2017 Final Rule. As listed in the footnotes of the January 2017 Final Rule, the isentropic exponent of air has some limited variability with atmospheric conditions, and DOE adopted a fixed value of 1.400 to align with the EU Lot 31 draft standard's metric calculations[5]. 82 FR 1052, 1084. As such, DOE is not proposing to amend the current fixed value of 1.400 for isentropic exponent in this test procedure NOPR.

DOE seeks comment regarding its initial determination to continue to use a fixed value of 1.400 for the isentropic exponent, as opposed to incorporating a K_6 correction factor.

[5] The referenced draft standard was published to the January 2020 ECS Final Rule's rulemaking docket and is available at: *www.regulations.gov/document/EERE-2013-BT-STD-0040-0031.*

See section V.E of this document for a list of issues on which DOE seeks comment.

2. Correction of Pressure Ratio at Full-Load Operating Pressure Formula

Section II.F of appendix A to subpart T of part 431 specifies a formula for pressure ratio at full-load operating pressure. The formula for pressure ratio at full-load operating pressure is used to classify whether a machine or apparatus qualifies as a compressor, as the definition of "compressor" stated in 10 CFR 431.342 states that the machine or apparatus must have a pressure ratio at full-load operating pressure greater than 1.3. Pressure ratio at full-load operating pressure does not factor directly into the measured values of compressor performance. CAGI, supported by Kaeser Compressors, commented that there is an apparent error in the formula for pressure ratio. (CAGI, No. 11 at p. 2, 4; Kaeser Compressors, No. 17 at p. 1).

DOE concurs with the commenters that the current formula is an error, as it both does not match the discussion in the preamble of the January 2017 Final Rule and does not contain terms related to the calculation of pressure ratio at full-load operating pressure.

The current formula for pressure ratio at full-load operating pressure inadvertently duplicates a formula used in a calculation related to determining a represented value of performance for a compressor basic model from a tested sample of units. Specifically, the current formula of pressure ratio at full-load operating pressure exactly matches the formula for the lower 95 percent confidence limit (LCL) of the true test mean divided by 0.95.

As a result, in this test procedure NOPR, DOE is proposing to change the formula for pressure ratio at full-load operating pressure in section II.F of appendix A to subpart T of part 431 to rectify this error and reflect the proper pressure ratio at full-load operating pressure equation that will be utilized in the test procedure.

Because the erroneous text did not include the accompanying variables (PR, P_1 and P_{FL}), it is unlikely that it would have been misinterpreted as the formula for pressure ratio at full-load operating pressure during the testing of compressors. In the January 2017 Final Rule, DOE adopted this revised method for measuring pressure ratio at full-load operating pressure to remove dependence on atmospheric pressure. This method uses a standard atmospheric pressure, 100 kPa, and uses the full-load operating pressure declared for the compressor. As a result, this method creates results that are independent of the atmospheric pressure at which testing is performed. 82 FR 1085. The correct calculation for pressure ratio at full-load operating pressure is shown below in equation 1:

$$\boldsymbol{PR = \frac{P_{FL}}{P_1}} \qquad \textbf{Eq. 1}$$

Where:

PR = pressure ratio at full-load operating pressure;

P_1 = 100 kPa; and

P_{FL} = full-load operating pressure, determined in section III.C.4 of appendix A to subpart T of part 431 (Pa gauge).

This change is proposed exclusively to fix a typographical error and has no effect on the scope of compressors subject to the test procedure, or the calculated values of isentropic efficiency.

DOE seeks comment regarding its proposal to correct the equation for pressure ratio at full-load operating pressure to amend a previous typographical error.

See section V.E of this document for a list of issues on which DOE seeks comment.

E. Representations of Energy Efficiency or Energy Use

DOE received a number of comments regarding the representative average use cycle applied in the current air compressor test procedure. Compressed Air Systems

commented saying that the current test procedure does not represent the average use cycle of an air compressor, and the results of the test procedure are not reflective of the actual industry application of air compressors. (Compressed Air Systems, No. 10 at p. 1, 3-4) It elaborated that the DOE test procedure results obtained from average use are inconsistent with the reality of air compressor usage, because all air compressors do not run at 100 percent duty cycle. In addition, Compressed Air Systems commented that the usage of fixed speed and variable speed compressors is impossible to determine. For variable speed compressors, Compressed Air Systems stated that the compressor may meet the DOE energy conservation standards when tested at 100 percent load but yield a much different result when tested reduced output. (Compressed Air Systems, No. 10 at p. 4) The CA IOU's recommended that DOE alter the current 100 percent duty testing cycle to an intermittent duty cycle that more accurately represents how certain air compressors are used. (CA IOU's, No. 14 at p. 7-8) ASAP, ACEEE, NRDC, and NYSERDA also encouraged DOE to explore testing air compressors at the fully unloaded state as well as fully loaded, since this would be more representative of typical usage. (ASAP, ACEEE, NRDC, and NYSERDA, No. 12 at p. 3)

DOE also received comments in support of keeping the existing test procedure requirements. CAGI, supported by Kaeser Compressors, commented in support of maintaining the current requirements, as there is no single average use cycle that could simulate all of the varied compressor applications and industries. (CAGI, No. 11 at p. 3; Kaeser Compressors, No. 17 at p. 1) Ingersoll Rand commented saying that it is impossible to accurately represent typical energy use in service with a single usage pattern. Ingersoll Rand stated that ISO 1217 Annex C/E provides a valid, practical, and repeatable approach in steady state conditions, and defining steady state conditions with metrics is the only way to accomplish this. Ingersoll Rand commented that although the current metric does not mimic a particular operating cycle, it does provide a consistent

and repeatable method that can be used by manufacturers and regulators. Ingersoll Rand supported the current test procedure, establishing energy efficiency testing requirements for fixed speed machines at full-load operating pressure and full-load volume flow rate, and variable-speed machines using a blended metric of efficiencies determined at 40, 70, and 100 percent of full-load volume flow rate and full-load operating pressure. (Ingersoll Rand, No. 13 at p. 2)

As commenters have noted, operating patterns in service vary considerably, by not only application and industry but also by site, by unit, and over time. But that is the case for many products and equipment covered by DOE's energy conservation standards. And DOE is not tasked with creating test procedures that measure energy efficiency for every possible application or pattern of use. Instead, DOE is tasked with developing a test procedure that is, among other things, reasonably designed to produce test results which reflect energy efficiency or use during a representative average use cycle. (42 U.S.C. 6314(a)(2)) To that end, the current energy efficiency metric for compressors is designed to be representative of compressor operating patterns at-large. The CA IOUs' comment includes reference to load factor data measured from in-service compressors, which the CA IOUs state suitably aligns with the current metric for variable-speed compressors (CA IOU's, No. 14 at p. 2)

Analogous data for fixed-speed compressors depicts most operation close to 100 percent of full-output, which corresponds to DOE's test metric for fixed-speed compressors. (CA IOU's, No. 14 at p. 3) The CA IOUs observe that the fixed-speed load factor distribution is bimodal with a second, smaller peak occurring at 40 percent of full-load, and note that this may correspond to unloaded (*i.e.,* supplying no compressed air to the application). Because the fixed-speed load factor shows operation close to 100 percent of full output as the most common usage, DOE has determined that the existing test metric that reflects this operation, rather than 40 percent of full load, is appropriate.

Additionally, the CA IOUs comment cites an estimate by Natural Resources Canada that unloaded operation consumes approximately 15-35 percent of full-load operating power. (CA IOU's, No. 14 at p. 3) Integrating that estimate with the observed apparent unloaded peak value of 40 percent cited by the CA IOUs produces an estimate of aggregate unloaded energy consumption fraction of 6-14 percent, a minority of the total and, thus, correspondingly less representative of fixed-speed compressor operation than the current requirement to test fixed-speed compressors at full load.

By contrast and as stated, comments by CAGI supported by Kaeser Compressors, and Ingersoll Rand express skepticism of the potential to improve the representativeness of the current metrics in view of the diversity of compressor operating patterns and support retaining the current metrics unmodified. (CAGI, No. 11 at p. 3; Kaeser Compressors, No. 17 at p. 1; Ingersoll Rand, No. 13 at p. 2)

Based on available data, DOE has initially determined that modifying either the variable- or fixed-speed metrics would not significantly improve representativeness as compared to the existing metric. Accordingly, DOE is not proposing to alter the current metric for compressors.

Regarding the CA IOU's suggestion of altering the current 100 percent duty testing cycle to an intermittent duty cycle, DOE reiterates the two different package isentropic efficiency metrics depending on equipment configuration: (1) Full-load package isentropic efficiency for certain fixed-speed compressors, and (2) part-load package isentropic efficiency for certain variable-speed compressors. In this NOPR, DOE tentatively concludes that these metrics provide a representative measurement of the energy performance of the rated compressor under an average cycle of use, as required by EPCA, and accurately represent how fixed-speed and variable-speed air compressors are used when considering the practicality and repeatability of the requirements of the test

procedure. (42 U.S.C. 6314(a)(2)) As a result, DOE is not proposing to alter the current duty testing cycle to an intermittent duty cycle in this test procedure NOPR.

Regarding ASAP, ACEEE, NRDC, and NYSERDA's recommendation of testing at the fully-unloaded state, while DOE agrees that information describing unloaded states of operation could be useful to the end user, their recommendation represents testing and reporting that is not essential to the output of the test procedure. Requiring such testing and reporting would represent an incremental burden beyond what DOE is proposing in this test procedure NOPR. To minimize undue incremental burden of this test procedure NOPR, as required by EPCA, DOE is not proposing mandatory testing or reporting of no-load power at this time. (42 U.S.C. 6314(a)(2))

DOE also received comments regarding the current test procedure requirements and the accuracy of their resultant measurements. Compressed Air Systems commented asking how DOE will provide accurate load data to establish a proper baseline. (Compressed Air Systems, No. 10 at p. 6) Alternatively, CAGI, supported by Kaeser Compressors, commented in support of the current test procedure requirements, saying that the test procedure accurately measures energy use, and that the measurements taken as a result of these requirements are the most accurate data that can be obtained practically. (CAGI, No. 11 at p. 2; Kaeser Compressors, No. 17 at p. 1) Similarly, Ingersoll Rand commented that the current test methods in the test procedure are the industry standard to produce accurate measurements of energy use and efficiency, and that they support the current test procedure requirements and recommend that they be reaffirmed. (Ingersoll Rand, No. 13 at p. 2)

The existing DOE test procedure is intended to produce results equivalent to those produced historically under ISO 1217:2009(E), as amended. For any future energy conservation standards rulemaking, DOE would consider the results of this test procedure, as amended through this rulemaking, to establish a proper baseline. Given the

other industry support for the current test procedure requirements, DOE is not proposing to amend the general test procedure requirements in this NOPR, except for the specific proposed amendments as discussed.

Additionally, DOE received comments regarding the loading states at which compressors should be tested. ASAP, ACEEE, NRDC, and NYSERDA jointly commented encouraging DOE to consider requiring fixed speed compressors with variable air flow controls to be tested at part-load. They stated that this would make it easier to compare part-load efficiency between fixed and variable speed compressors and would allow buyers to have more data to select the best compressor for their application. (ASAP, ACEEE, NRDC, and NYSERDA, No. 12 at p. 3)

To assess a part-load package isentropic efficiency metric for fixed-speed variable airflow compressors, DOE reviewed the scope and applicability of relevant, comparable testing and rating programs, namely, the CAGI Performance Verification Program and the EU Lot 31 draft standard for compressors[5]. The CAGI Performance Verification Program separates rotary compressors into only two groupings: (1) "rotary compressors," and (2) "rotary variable frequency drive compressors." The former rates compressors at only full-load operating pressure, while the latter allows for multiple ratings at reduced flows. However, as indicated by the name of the latter grouping, it encompasses only compressors driven by variable-frequency drives. Consequently, fixed-speed variable airflow compressors are considered "rotary compressors" by the CAGI Performance Verification Program and are rated at only full-load operating pressure. Similar to the CAGI program, the EU Lot 31 draft standard considers a fixed-speed variable airflow compressor to be a fixed-speed rotary standard air compressor, which is rated at only full-load operating pressure. Considering the precedent established by CAGI and the EU, the lack of a verified test method, and the lack of verified historical performance data, DOE concludes that it is not warranted to establish part-load package isentropic efficiency as

the rating metric for non-speed-varying variable airflow compressors at this time. Consequently, in this NOPR, DOE tentatively reaffirms that full-load package isentropic efficiency applies to fixed-speed compressors, and part-load package isentropic efficiency applies to variable-speed compressors.

Finally, DOE received a comment regarding the number of test points for variable frequency drive (VFD)-equipped air compressors. In their comment, the CA IOU's provided a load distribution for in-scope VFD-controlled air compressor equipment, showing that it is generally lower in load factor relative to out-of-scope VFD-controlled compressors, and stated that VFD-equipped air compressors would benefit from additional load points (CA IOU's, No. 14 at p. 2). The CA IOU's also recommended that DOE consider including overload test points since loads above a 1.0 load factor are observed in the dataset. (CA IOU's, No. 14 at p. 3-4) The CA IOUs also state that the current test procedure's measurement points are sufficiently representative for in-scope compressors.

DOE concurs with the CA IOUs characterization of the current test points as being sufficiently representative for in-scope compressors. As discussed in section III.A, DOE is proposing not to expand the scope of the compressors test procedure in this NOPR. Accordingly, adding load points for variable-speed compressors would increase testing burden without significantly improving the representativeness of the test procedure. As such, DOE is not proposing to revise the required test load points for variable-speed compressors in this NOPR. (42 U.S.C. 6314(a)(2))

DOE seeks comment regarding its proposal to maintain the number of test points for VFD-equipped air compressors, and to not include overload test points above a 1.0 load factor.

See section V.E of this document for a list of issues on which DOE seeks comment.

1. Operating Costs

Compressed Air Systems commented that compressor operating costs and associated emissions were incorrectly calculated due to having been based on a 100% duty cycle, or a compressor that operates continuously at maximum output until the end of its life. (Compressed Air Systems, No. 10 at p. 4) Compressed Air Systems states that this is not an accurate representation of actual compressor operating patterns.

DOE concurs with Compressed Air System that compressors vary widely in operating patterns and duty cycle. However, that the test procedure measures performance of fixed-speed compressors at full-load does not require a corresponding assumption in the analysis supporting DOE's January 2020 ECS Final Rule that compressors may only ever be operated that way. Table IV.15 of the January 2020 ECS Final Rule presents average annual hours of operating as a function of compressor capacity, which range from a minimum of 3,385 (for the lowest-capacity compressors) to a maximum of 4,248 (for the highest-capacity compressors). 85 FR 1504, 1550. Those figures equate to respective annualized duty cycles of 39 percent and 48 percent, and are used as inputs into subsequent operating cost calculations used in the analysis of the January 2020 ECS Final Rule. Accordingly, DOE is proposing not to revise the requirement to measure the performance of fixed-speed compressors at full load, or more specifically, full-load actual volume flow rate at full-load operating pressure, as described in paragraph C.1 of appendix A to subpart T of part 431.

DOE seeks comment regarding if the test procedure reflects actual operating costs for compressors based on their realistic average use cycles.

See section V.E of this document for a list of issues on which DOE seeks comment.

F. Reporting

Manufacturers, including importers, must use product-specific certification templates to certify compliance to DOE. For compressors, the certification template reflects the general certification requirements specified at 10 CFR 429.12 and the product-specific requirements specified at 10 CFR 429.63. As discussed in the previous paragraphs, DOE is not proposing to amend the product-specific certification requirements for these products.

DOE received a comment regarding the availability of compressor rating data. The CA IOU's commented encouraging DOE to ensure that unloaded air compressor rating data is loaded into the DOE Compliance Certification Management System database so that the data is accessible to end users. (CA IOU's, No. 14 at p. 3-4) As discussed in section III.E of this NOPR, DOE is not proposing any mandatory testing of no-load power. Accordingly, DOE is not proposing to require reporting of such metrics. Manufacturers may choose to voluntarily measure and provide no-load power as part of their model literature.

G. Test Procedure Costs and Harmonization

1. Test Procedure Costs and Impact

EPCA requires that test procedures proposed by DOE not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)) The following sections discuss DOE's evaluation of estimated costs associated with the proposed amendments.

DOE received comments regarding the overall financial impact of this test procedure NOPR on domestic manufacturers. Compressed Air Systems commented wondering how DOE will remove the significant effects that will place an undue burden on small domestic manufacturers, and how DOE will protect small manufacturers from

substantial financial impacts due to this test procedure. (Compressed Air Systems, No. 10 at p. 3) Also, Compressed Air Systems stated that the current testing method has provided a competitive advantage to large U.S. companies, as well as foreign air compressor manufacturers, and has placed an undue burden on small U.S. air compressor manufacturers. (Compressed Air Systems, No. 10 at p. 4) Compressed Air Systems also stated that there is only 1 lab in the United States that can perform the DOE test method, and it would take 155 days to test and provide the results, noting that the test procedure is unduly burdensome. (Compressed Air Systems, No. 10 at p. 4)

Though not addressing burden per se, CAGI noted in its comment that the ISO 1217 standard has been used within the compressor industry for decades, predating the January 2017 Final Rule, and is a proven means of accurately measuring positive-displacement compressor performance. (CAGI, No. 11 at p. 3)

That ISO 1217 was widely used by industry prior to incorporation by reference by DOE as part of its own test procedure rulemaking calls into question the difficulty of implementing it, since the industry can be presumed unlikely to create and voluntarily use a procedure that was unduly burdensome. Although Compressed Air Systems states that only a single laboratory is capable of conducting the DOE test procedure, it is unclear whether that reflects inherent difficulty in conducting it or a relative absence of demand for third-party testing. Also, Compressed Air Systems does not address whether any manufacturers, themselves, are capable of testing compressors.

In this NOPR, DOE proposes to: (1) update the formula for pressure ratio at full-load operating pressure currently presented in 10 CFR part 431, subpart T to rectify a previous error and (2) modify the current definition of "air compressor" to clarify that compressors with more than one compression element are still within the scope of this test procedure, and to revise the typographical error of "compressor element" to "compression elements."

DOE does not anticipate any added test burden from this change, nor does it anticipate any associated costs with this proposed amendment. Additionally, the only thing manufacturers would need to do differently based on this proposed change is use the corrected formula for the determination of pressure ratio at full-load operating pressure, which will be updated and provided by DOE in appendix A to subpart T of part 431.

DOE has initially determined that this proposed amendment would not impact the representations of energy efficiency/energy use for compressors. Based on the initial determination manufacturers would be able to rely on data generated under the current test procedure should the proposed amendments be finalized. As a result, retesting of compressors would not be required solely as a result of DOE's adoption of the proposed amendments to the test procedure.

DOE has concluded that the test procedure and associated representation requirements established in this test procedure NOPR are not unduly burdensome, as: (1) the test method follows accepted industry practice, and (2) no models would need to be retested in order to continue to make representations. DOE notes that impact to each manufacturer will be different, and manufacturers may petition DOE for an extension of the 180-day representations requirement, for up to an additional 180 days, if manufacturers feel it represents an undue hardship. (42 U.S.C. 6314 (d)(2)) However, as any representations are voluntary prior to the compliance date of any energy conservations standards for compressors, there is no direct burden associated with any of the testing requirements established in this NOPR.

2. Harmonization with Industry Standards

DOE's established practice is to adopt relevant industry standards as DOE test procedures unless such methodology would be unduly burdensome to conduct or would not produce test results that reflect the energy efficiency, energy use, water use (as

specified in EPCA) or estimated operating costs of that product during a representative average use cycle. 10 CFR 431.4; section 8(c) of appendix A of 10 CFR part 430 subpart C. In cases where the industry standard does not meet EPCA statutory criteria for test procedures DOE will make modifications through the rulemaking process to these standards as the DOE test procedure.

The test procedure for compressors at appendix A to subpart T of part 431 is based on, and incorporates by reference, much of ISO Standard 1217:2009(E), (ISO 1217:2009(E)), "Displacement compressors—Acceptance tests," as amended through Amendment 1:2016. DOE does not propose to incorporate any new industry standards by reference via amendment in this NOPR. The industry standards DOE has incorporated by reference for the test procedure for compressors are located in 10 CFR 431.343.

DOE requests comments on the benefits and burdens of the proposed updates to the test procedure for compressors.

H. Compliance Date

EPCA prescribes that, if DOE amends a test procedure, all representations of energy efficiency and energy use, including those made on marketing materials and product labels, must be made in accordance with that amended test procedure, beginning 180 days after publication of such a test procedure final rule in the *Federal Register*. (42 U.S.C. 6314(d)(1).

If DOE were to publish an amended test procedure EPCA provides an allowance for individual manufacturers to petition DOE for an extension of the 180-day period if the manufacturer may experience undue hardship in meeting the deadline. (42 U.S.C. 6314(d)(2). To receive such an extension, petitions must be filed with DOE no later than 60 days before the end of the 180-day period and must detail how the manufacturer will experience undue hardship. (*Id.*)

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Orders 12866 and 13563

Executive Order ("E.O.")12866, "Regulatory Planning and Review," as supplemented and reaffirmed by E.O. 13563, "Improving Regulation and Regulatory Review," 76 FR 3821 (Jan. 21, 2011), requires agencies, to the extent permitted by law, to (1) propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify); (2) tailor regulations to impose the least burden on society, consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations; (3) select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity); (4) to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt; and (5) identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public. DOE emphasizes as well that E.O. 13563 requires agencies to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible. In its guidance, the Office of Information and Regulatory Affairs ("OIRA") in the Office of Management and Budget ("OMB") has emphasized that such techniques may include identifying changing future compliance costs that might result from technological innovation or anticipated behavioral changes. For the reasons stated in the preamble, this proposed regulatory action is consistent with these principles.

Section 6(a) of E.O. 12866 also requires agencies to submit "significant regulatory actions" to OIRA for review. OIRA has determined that this proposed regulatory action does not constitute a "significant regulatory action" under section 3(f) of E.O. 12866. Accordingly, this action was not submitted to OIRA for review under E.O. 12866.

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq*.) requires preparation of an initial regulatory flexibility analysis ("IRFA") for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. As required by Executive Order 13272, "Proper Consideration of Small Entities in Agency Rulemaking," 67 FR 53461 (August 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's website: *www.energy.gov/gc/office-general-counsel*. DOE reviewed this proposed rule under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003.

For manufacturers of compressors, the Small Business Administration ("SBA") has set a size threshold, which defines those entities classified as "small businesses" for the purposes of the statute. DOE used the SBA's small business size standards to determine whether any small entities would be subject to the requirements of the rule. 13 CFR part 121. The size standards are listed by North American Industry Classification System ("NAICS") code and industry description and are available at *www.sba.gov/document/support-tablesize-standards*. Compressor manufacturing is classified under NAICS 333912, "air and gas compressor manufacturing." The SBA sets

a threshold of 1,000 employees or less for an entity to be considered as a small business in this category. This employment figure is enterprise-wide, encompassing employees at all parent, subsidiary, and sister corporations.

To identify and estimate the number of small business manufacturers of equipment within the scope of this proposed rulemaking, DOE conducted a market survey using available public information. DOE's research involved industry trade association membership directories (including CAGI), individual company and online retailer websites, and market research tools (*e.g.*, Hoovers reports) to create a list of companies that manufacture equipment covered by this rulemaking. DOE additionally reviewed publicly-available data, data available through market research tools, and contacted select companies on its list, as necessary, to determine whether they met the SBA's definition of a small business manufacturer. DOE screened out companies that do not offer equipment within the scope of this proposed rulemaking, do not meet the definition of a "small business," or are foreign-owned and operated.

DOE identified a total of 12 domestic small businesses manufacturing compressors. However, as previously stated, the amendments proposed in this NOPR revise certain definitions and formulas to ensure the clarity and accuracy of existing requirements and procedures. DOE has determined that the proposed test procedure amendments would not impact testing costs otherwise experienced by manufacturers.

Therefore, DOE initially concludes that the impacts of the proposed test procedure amendments would not have a "significant economic impact on a substantial number of small entities," and that the preparation of an IRFA is not warranted. DOE will transmit the certification and supporting statement of factual basis to the Chief Counsel for Advocacy of the Small Business Administration for review under 5 U.S.C. 605(b).

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of compressors must certify to DOE that their products comply with any applicable energy conservation standards. To certify compliance, manufacturers must first obtain test data for their products according to the DOE test procedure, including any amendments adopted for the test procedure. DOE has established regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including compressors. (*See* generally 10 CFR part 429.) The collection-of-information requirement for the certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act ("PRA"). This requirement has been approved by OMB under OMB control number 1910-1400. Public reporting burden for the certification is estimated to average 35 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The amendments adopted in this final rule do not impact the certification and reporting requirements for compressors.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.

D. Review Under the National Environmental Policy Act of 1969

In this NOPR, DOE proposes test procedure amendments that it expects will be used to develop and implement future energy conservation standards for compressors. DOE has determined that this proposed rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq*.) and DOE's implementing regulations at 10 CFR part 1021.

Specifically, DOE has determined that adopting a test procedure for measuring energy efficiency of consumer products and industrial equipment is consistent with activities identified in 10 CFR part 1021, appendix A to subpart D, A5 and A6. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, "Federalism," 64 FR 43255 (Aug. 4, 1999) imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have federalism implications. The Executive order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735. DOE has examined this proposed rule and has determined that it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the products that are the subject of this proposed rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, "Civil Justice Reform," 61 FR 4729

(Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) Eliminate drafting errors and ambiguity, (2) write regulations to minimize litigation, (3) provide a clear legal standard for affected conduct rather than a general standard, and (4) promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that executive agencies make every reasonable effort to ensure that the regulation (1) clearly specifies the preemptive effect, if any, (2) clearly specifies any effect on existing Federal law or regulation, (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction, (4) specifies the retroactive effect, if any, (5) adequately defines key terms, and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, the proposed rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 ("UMRA") requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Pub. L. 104-4, sec. 201 (codified at 2 U.S.C. 1531). For a proposed regulatory action likely to result in a rule that may cause the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of $100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)) The UMRA also requires a Federal agency to develop an effective process to permit

timely input by elected officers of State, local, and Tribal governments on a proposed "significant intergovernmental mandate," and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820; also available at *www.energy.gov/gc/office-general-counsel*. DOE examined this proposed rule according to UMRA and its statement of policy and determined that the proposed rule contains neither an intergovernmental mandate, nor a mandate that may result in the expenditure of $100 million or more in any year, so these requirements do not apply.

H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This proposed rule would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

I. Review Under Executive Order 12630

DOE has determined, under Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights," 53 FR 8859 (March 18, 1988), that this proposed regulation would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

J. Review Under Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (Feb. 22,

2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). Pursuant to OMB Memorandum M-19-15, Improving Implementation of the Information Quality Act (April 24, 2019), DOE published updated guidelines which are available at *www.energy.gov/sites/prod/files/2019/12/f70/DOE%20Final%20Updated%20IQA%20Guidelines%20Dec%202019.pdf*. DOE has reviewed this proposed rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OMB, a Statement of Energy Effects for any proposed significant energy action. A "significant energy action" is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

The proposed regulatory action to amend the test procedure for measuring the energy efficiency of compressors is not a significant regulatory action under Executive Order 12866. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects.

L. Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95–91; 42 U.S.C. 7101), DOE must comply with section 32 of the Federal Energy Administration Act of 1974, as amended by the Federal Energy Administration Authorization Act of 1977. (15 U.S.C. 788; "FEAA") Section 32 essentially provides in relevant part that, where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the Federal Trade Commission ("FTC") concerning the impact of the commercial or industry standards on competition.

The proposed modifications to the test procedure for compressors would incorporate testing methods contained in certain sections of the following commercial standards: ISO 1217:2009(E), as amended through ISO 1217:2009(E)/Amd.1:2016. While this test procedure is not exclusively based on this industry testing standard, some components of the DOE test procedure adopt definitions, test parameters, measurement techniques, and additional calculations from them without amendment. DOE has evaluated these standards and is unable to conclude whether it fully complies with the requirements of section 32(b) of the FEAA (*i.e.*, whether it was developed in a manner that fully provides for public participation, comment, and review.) In the January 2017 Final Rule, DOE consulted with both the Attorney General and the Chairman of the FTC about the impact on competition of using the methods contained in these standards and received no comments objecting to their use. 82 FR 1099.

M. Description of Materials Incorporated by Reference

The following standards were previously approved for incorporation by reference in subpart T, appendix A, and no change is being proposed:

1. ISO 1217:2009(E), "Displacement compressors—Acceptance tests," July 1, 2009, sections 2, 3, and 4; sections 5.2, 5.3, 5.4, 5.6, 5.9; paragraphs 6.2(g), and 6.2(h) including Table 1; Annex C (excluding C.1.2, C.2.1, C.3, C.4.2.2, C.4.3.1, and C.4.5).

2. ISO 1217:2009/Amd.1:2016(E), Displacement compressors—Acceptance tests (Fourth edition); Amendment 1: "Calculation of isentropic efficiency and relationship with specific energy," April 15, 2016, sections 3.5.1 and 3.6.1; sections H.2 and H.3 of Annex H.

V. Public Participation

A. Participation in the Webinar

The time and date of the webinar meeting are listed in the **DATES** section at the beginning of this document. Webinar registration information, participant instructions, and information about the capabilities available to webinar participants will be published on DOE's website: *www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=6&action=viewlive*. Participants are responsible for ensuring their systems are compatible with the webinar software.

B. Procedure for Submitting Prepared General Statements for Distribution

Any person who has an interest in the topics addressed in this proposed rule, or who is representative of a group or class of persons that has an interest in these issues, may request an opportunity to make an oral presentation at the webinar. Such persons may submit to *ApplianceStandardsQuestions@ee.doe.gov*. Persons who wish to speak should include with their request a computer file in WordPerfect, Microsoft Word, PDF, or text (ASCII) file format that briefly describes the nature of their interest in this proposed rulemaking and the topics they wish to discuss. Such persons should also provide a daytime telephone number where they can be reached.

C. Conduct of the Public Meeting

DOE will designate a DOE official to preside at the webinar/public meeting and may also use a professional facilitator to aid discussion. The meeting will not be a judicial or evidentiary-type public hearing, but DOE will conduct it in accordance with section 336 of EPCA (42 U.S.C. 6306). A court reporter will be present to record the proceedings and prepare a transcript. DOE reserves the right to schedule the order of presentations and to establish the procedures governing the conduct of the webinar/public meeting. There shall not be discussion of proprietary information, costs or prices, market share, or other commercial matters regulated by U.S. anti-trust laws. After the webinar/public meeting and until the end of the comment period, interested parties may submit further comments on the proceedings and any aspect of the rulemaking.

The webinar will be conducted in an informal, conference style. DOE will present a general overview of the topics addressed in this proposed rulemaking, allow time for prepared general statements by participants, and encourage all interested parties to share their views on issues affecting this proposed rulemaking. Each participant will be allowed to make a general statement (within time limits determined by DOE), before the discussion of specific topics. DOE will permit, as time permits, other participants to comment briefly on any general statements.

At the end of all prepared statements on a topic, DOE will permit participants to clarify their statements briefly. Participants should be prepared to answer questions by DOE and by other participants concerning these issues. DOE representatives may also ask questions of participants concerning other matters relevant to this proposed rulemaking. The official conducting the webinar/public meeting will accept additional comments or questions from those attending, as time permits. The presiding official will announce any further procedural rules or modification of the above procedures that may be needed for the proper conduct of the webinar/public meeting.

A transcript of the webinar will be included in the docket, which can be viewed as described in the *Docket* section at the beginning of this proposed rule. In addition, any person may buy a copy of the transcript from the transcribing reporter.

D. Submission of Comments

DOE will accept comments, data, and information regarding this proposed rule before or after the public meeting, but no later than the date provided in the **DATES** section at the beginning of this proposed rule.[6] Interested parties may submit comments, data, and other information using any of the methods described in the **ADDRESSES** section at the beginning of this document.

Submitting comments via www.regulations.gov. The *www.regulations.gov* webpage will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies 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 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 itself 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

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[6] DOE has historically provided a 75-day comment period for test procedure NOPRs pursuant to the North American Free Trade Agreement, U.S.-Canada-Mexico ("NAFTA"), Dec. 17, 1992, 32 I.L.M. 289 (1993); the North American Free Trade Agreement Implementation Act, Pub. L. 103-182, 107 Stat. 2057 (1993) (codified as amended at 10 U.S.C.A. 2576) (1993) ("NAFTA Implementation Act"); and Executive Order 12889, "Implementation of the North American Free Trade Agreement," 58 FR 69681 (Dec. 30, 1993). However, on July 1, 2020, the Agreement between the United States of America, the United Mexican States, and the United Canadian States ("USMCA"), Nov. 30, 2018, 134 Stat. 11 (*i.e.*, the successor to NAFTA), went into effect, and Congress's action in replacing NAFTA through the USMCA Implementation Act, 19 U.S.C. 4501 *et seq*. (2020), implies the repeal of E.O. 12889 and its 75-day comment period requirement for technical regulations. Thus, the controlling laws are EPCA and the USMCA Implementation Act. Consistent with EPCA's public comment period requirements for consumer products, the USMCA only requires a minimum comment period of 60 days. Consequently, DOE now provides a 60-day public comment period for test procedure NOPRs.

any document attached to your comment. Otherwise, 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 *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 *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 *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 *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 in 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, in which case 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 that are 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. Pursuant 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 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. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

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).

E. Issues on Which DOE Seeks Comment

Although DOE welcomes comments on any aspect of this proposal, DOE is particularly interested in receiving comments and views of interested parties concerning the following issues:

(1) DOE seeks comment regarding its proposal to not include reciprocating compressors within the scope of test procedure applicability.

(2) DOE seeks comment regarding its proposal not to include centrifugal compressors within the scope of test procedure applicability.

(3) DOE seeks comment regarding whether other dynamic compressor varieties than centrifugal compete with the air compressor categories discussed in this NOPR.

(4) DOE seeks comment regarding its initial determination to not include compressors with a horsepower rating above 200 hp within the scope of test procedure applicability.

(5) DOE seeks comment regarding its proposal to not include lubricant-free compressors within the scope of test procedure applicability.

(6) DOE seeks comment regarding its proposal to not include compressors with brushed motors within the scope of test procedure applicability.

(7) DOE seeks comment regarding its proposal to not include equipment for compressed air applications for pressures under 75 psig within the scope of test procedure applicability.

(8) DOE seeks comment regarding its initial determination to continue to use ISO 1217:2009(E) as amended through Amendment 1:2016 as the basis for the compressors test procedure.

(9) DOE seeks comment regarding its proposal to maintain the current ambient temperature range requirement of 68-90 °F for testing air compressors.

(10) DOE seeks comment regarding its proposal to continue to use the tolerances for measured energy efficiency values specified in ISO 1217:2009(E).

(11) DOE seeks comment regarding its proposed amendment of the definition of "air compressor."

(12) DOE seeks comment regarding its initial determination to continue to limit the scope of applicability of this test procedure to compressors driven by brushless electric motors.

(13) DOE seeks comment regarding its initial determination to continue to use a fixed value of 1.400 for the isentropic exponent, as opposed to incorporating a K6 correction factor.

(14) DOE seeks comment regarding its proposal to correct the equation for pressure ratio at full-load operating pressure to amend a previous typographical error.

(15) DOE seeks comment regarding its proposal to maintain the number of test points for VFD-equipped air compressors, and to not include overload test points above a 1.0 load factor.

(16) DOE seeks comment regarding if the test procedure reflects actual operating costs for compressors based on their realistic average use cycles.

(17) DOE requests comments on the benefits and burdens of the proposed updates to the test procedure for compressors.

Additionally, DOE welcomes comments on other issues relevant to the conduct of this rulemaking that may not specifically be identified in this document.

VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this notice of proposed rulemaking and announcement of public meeting.

List of Subjects in 10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Reporting and recordkeeping requirements.

Signing Authority

This document of the Department of Energy was signed on February 2, 2023, by Francisco Alejandro Moreno, Acting Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on February 2, 2023.

Treena V. Garrett,

Federal Register Liaison Officer,

U.S. Department of Energy.

For the reasons stated in the preamble, DOE is proposing to amend part 431 of Chapter II of Title 10, Code of Federal Regulations as set forth below:

PART 431— ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

1. The authority citation for part 431 continues to read as follows:

Authority: 42 U.S.C. 6291–6317; 28 U.S.C. 2461 note.

2. Section 431.342 is amended by revising the definition of "Air compressor" to read as follows:

§ 431.342 Definitions concerning compressors.

* * * * *

Air compressor means a compressor designed to compress air that has an inlet open to the atmosphere or other source of air, and is made up of one or more compression elements (bare compressors), driver(s), mechanical equipment to drive the compression elements, and any ancillary equipment.

* * * * *

3. Appendix A to subpart T of part 431 is amended by revising section II.F. to read as follows:

Appendix A to Subpart T of Part 431 – Uniform Test Method for Certain Air Compressors

* * * * *

II. * * *

F. Determination of Pressure Ratio at Full-Load Operating Pressure

Pressure ratio at full-load operating pressure, as defined in §431.342, is calculated using the following equation:

$$PR = \frac{P_{FL}}{P_1}$$

Where:

PR = pressure ratio at full-load operating pressure;

P_1 = 100 kPa; and

P_{FL} = full-load operating pressure, determined in section III.C.4 of this appendix (Pa gauge).

* * * * *

[FR Doc. 2023-02589 Filed: 2/10/2023 8:45 am; Publication Date: 2/13/2023]