DEPARTMENT OF ENERGY

10 CFR Parts 429 and 431

[EERE–2021–BT–TP–0017]

RIN 1904–AE45

Energy Conservation Program: Test Procedure for Computer Room Air Conditioners

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

ACTION: Notice of proposed rulemaking and request for comment.

SUMMARY: The U.S. Department of Energy (DOE or the Department) proposes to amend its test procedure for computer room air conditioners (CRACs) to incorporate by reference the latest draft version of the relevant industry consensus test standard. DOE also proposes to adopt the net sensible coefficient of performance (NSenCOP) metric in its test procedures for CRACs. Additionally, DOE proposes to amend certain provisions for representations and enforcement. DOE welcomes written comments from the public on any subject within the scope of this document (including topics not raised in this proposal), as well as the submission of data and other relevant information.

DATES:

Comments: DOE will accept comments, data, and information regarding this notice of proposed rulemaking (NOPR) no later than April 8, 2022. See section V, ''Public Participation,'' for details.

Meeting: DOE will hold a webinar on Tuesday, March, 15, 2022, 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.* Follow the instructions for submitting comments.

Alternatively, interested persons may submit comments, identified by docket number EERE–2021–BT–TP–0017, by any of the following methods:

(1) *Federal eRulemaking Portal: www.regulations.gov.* Follow the instructions for submitting comments.

(2) *Email: ComputerRoomAC2021TP0017@ee.doe.gov.* Include docket number EERE–2021–BT–TP–0017 in the subject line of the message.

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

Although DOE has routinely accepted public comment submissions through a variety of mechanisms, including the Federal eRulemaking Portal, email, postal mail, or hand delivery/courier, the Department has found it necessary to make temporary modifications to the comment submission process in light of the ongoing COVID–19 pandemic. DOE is currently suspending receipt of public comments via postal mail and hand delivery/courier. If a commenter finds that this change poses an undue hardship, please contact Appliance Standards Program staff at (202) 586–1445 to discuss the need for alternative arrangements. Once the COVID–19 pandemic health emergency is resolved, DOE anticipates resuming all of its regular options for public comment submission, including postal mail and hand delivery/courier.

Docket: The docket, which includes **Federal Register** notices, public meeting/webinar attendee lists and transcripts, 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, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket web page can be found at: *www.regulations.gov/docket/EERE-2021-BT-TP-0017.* The docket web page contains instructions on how to access all documents, including public comments, in the docket. See section V (Public Participation) for information on how to submit comments through *www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT:

Ms. Catherine Rivest, 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) 586–7335. Email: *ApplianceStandardsQuestions@ee.doe.gov.*

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

SUPPLEMENTARY INFORMATION: DOE proposes to incorporate by reference the following draft industry standard into parts 429 and 431:

Air-Conditioning, Heating and Refrigeration Institute (''AHRI'') Standard 1360–202X Draft, ''Performance Rating of Computer and Data Processing Room Air Conditioners (''Draft Standard'').'' AHRI Standard 1360–202X Draft is in draft form and its text was provided to the Department for the purposes of review only during the drafting of this NOPR. DOE intends to update the reference to the final published version of AHRI 1360–202X Draft in the Final Rule, unless there are substantive changes between the draft and published versions, in which case DOE may adopt the substance of the AHRI 1360–202X Draft or provide additional opportunity for comment on the changes to the industry consensus test procedure.

A copy of AHRI 1360–202X Draft is attached in this docket for review.

DOE proposes to maintain and update the previously approved incorporation by reference for the following industry standards in part 431:

ANSI/ASHRAE Standard 37–2009, ''Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment,'' ASHRAE approved June 24, 2009.

Copies of ANSI/ASHRAE Standard 37–2009 can be obtained from the American National Standards Institute, 25 W 43rd Street, 4th Floor, New York, NY 10036, (212) 642–4900, or online at: *webstore.ansi.org/.*

American National Standards Institute (''ANSI'')/American Society of Heating, Refrigerating, and Air-Conditioning Engineers (''ASHRAE'') Standard 127–2007 ''Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners,'' ANSI approved June 28, 2007.

Copies of ANSI/ASHRAE Standard 127–2007 can be obtained from the American National Standards Institute, 25 W 43rd Street, 4th Floor, New York, NY 10036, (212) 642–4900, or online at: *https://webstore.ansi.org/.*

DOE proposes to incorporate by reference the following industry standard in part 431:

ANSI/ASHRAE Standard 127–2020, ''Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners,'' ANSI approved November 30, 2020.

Copies of ANSI/ASHRAE Standard 127–2020 can be obtained from the American National Standards Institute, 25 W 43rd Street, 4th Floor, New York, NY 10036, (212) 642–4900, or online at: *webstore.ansi.org/.*

See section IV.M of this document for further discussion of these standards.

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I. Authority and Background

Small, large, and very large commercial package air conditioning and heating equipment are included in the list of ''covered equipment'' for which DOE is authorized to establish and amend energy conservation standards and test procedures. (42 U.S.C. 6311(1)(B)–(D)) Commercial package air conditioning and heating equipment includes CRACs as an equipment category. The current DOE test procedures for CRACs are codified at Title 10 of the Code of Federal Regulations (CFR), part 431, subpart F, appendix A, ''Uniform Test Method for the Measurement of Energy Consumption of Air-Cooled Small (≥65,000 Btu/h),[1] Large, and Very Large Commercial Package Air Conditioning and Heating Equipment'' (appendix A). The following sections discuss DOE's authority to establish and amend test procedures for CRACs, as well as relevant background information regarding DOE's consideration of and proposed amendments to the test procedures for this equipment.

A. Authority

The Energy Policy and Conservation Act, as amended (EPCA),[2] among other things, authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part C[3] of EPCA, Public Law 94–163 (42 U.S.C. 6311–6317, as codified), added by Public Law 95–619, Title IV, section 441(a), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. This covered equipment includes small, large, and very large commercial package air conditioning and heating equipment. (42 U.S.C. 6311(1)(B)–(D)) Commercial package air conditioning and heating equipment includes CRACs, which are the subject of this NOPR.

The energy conservation program under EPCA consists essentially of four parts: (1) Testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6311), energy conservation standards (42 U.S.C. 6313), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), and the authority to require information and reports from manufacturers (42 U.S.C. 6316).

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(b); 42 U.S.C. 6296), and (2) making representations about the efficiency of that equipment (42 U.S.C. 6314(d)). Similarly, DOE uses these test procedures to determine whether the equipment complies with relevant standards promulgated under EPCA.

Federal energy efficiency requirements for covered equipment established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6316(a) and (b); 42 U.S.C. 6297) DOE may, however, grant waivers of Federal preemption in limited circumstances for particular State laws or regulations, in accordance with the procedures and other provisions of EPCA. (42 U.S.C. 6316(b)(2)(D))

Under 42 U.S.C. 6314, the statute also sets forth the criteria and procedures DOE is required to follow when prescribing or amending test procedures for covered equipment. Specifically, EPCA requires that any test procedure prescribed or amended shall be reasonably designed to produce test results which measure energy efficiency, energy use, or estimated annual operating cost of covered

[1] ''Btu/h'' refers to British thermal units per hour.

[2] All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Public Law 116–260 (Dec. 27, 2020).

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

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)).

As discussed, CRACs are a category of commercial package air conditioning and heating equipment. EPCA requires that the test procedures for commercial package air conditioning and heating equipment be those generally accepted industry testing procedures or rating procedures developed or recognized by AHRI or by ASHRAE, as referenced in ASHRAE Standard 90.1, ''Energy Standard for Buildings Except Low-Rise Residential Buildings'' (ASHRAE Standard 90.1). (42 U.S.C. 6314(a)(4)(A)) Further, if such an industry test procedure is amended, DOE must update its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B))

EPCA also requires that, at least once every seven years, DOE evaluate test procedures for each type of covered equipment, including commercial package air conditioning and heating equipment (of which CRACs are a category), to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures not to 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)–(3)).

If DOE determines that a test procedure amendment is warranted, it must publish proposed test procedures 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 procedures. (42 U.S.C. 6314(b)) If DOE determines that test procedure revisions are not appropriate, DOE must publish in the **Federal Register** its determination not to amend the test procedures. (42 U.S.C. 6314(a)(1)(A)(ii))

DOE is publishing this NOPR proposing amendments to the test procedures for CRACs in satisfaction of its aforementioned obligations under EPCA.

B. Background

On May 16, 2012, DOE published a final rule in the **Federal Register**, which, in relevant part, adopted test procedures for CRACs that incorporate by reference ANSI/ASHRAE Standard 127–2007, ''*Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners*'' (ANSI/ASHRAE 127–2007), which is the industry test procedure referenced in ASHRAE Standard 90.1–2010 for CRACs, as the basis for the Federal test procedure for such equipment. 77 FR 28928, 28989 (May 16, 2012). On October 26, 2016, ASHRAE published ASHRAE Standard 90.1–2016, which included updates to the test procedure references for CRACs as compared to ASHRAE Standard 90.1–2010 and ASHRAE Standard 90.1–2013.[4] This action by ASHRAE triggered DOE's obligations under 42 U.S.C. 6314(a)(4)(B), as outlined previously. On July 25, 2017, DOE published a request for information (RFI) (the July 2017 ASHRAE TP RFI) in the **Federal Register** to collect information and data to consider amendments to DOE's test procedures for commercial package air conditioning and heating equipment, given the test procedure updates included in ASHRAE Standard 90.1–2016. 82 FR 34427. As part of the July 2017 ASHRAE TP RFI, DOE identified several aspects of the currently applicable Federal test procedure that might warrant modifications, in particular: Incorporation by reference of the most recent version of the relevant industry standard(s); efficiency metrics and calculations; clarification of test methods; and any additional topics that may inform DOE's decisions in a future test procedure rulemaking, including methods to reduce regulatory burden while ensuring the test procedures' accuracy.

DOE received a number of comments regarding CRACs from interested parties in response to the July 2017 ASHRAE TP RFI, which covered multiple categories of equipment. Table I–1 lists the commenters relevant to CRACs, along with each commenter's abbreviated name used throughout this NOPR. Discussion of the relevant comments, and DOE's responses, are provided in the appropriate sections of this document. A parenthetical reference at the end of a comment quotation or paraphrase provides the location of the item in the public record.[5]

TABLE I–1—INTERESTED PARTIES PROVIDING CRAC-RELATED WRITTEN COMMENTS IN RESPONSE TO THE JULY 2017 ASHRAE TP RFI

Name	Abbreviation	Type
Air-Conditioning, Heating, and Refrigeration Institute	AHRI	IR.
Appliance Standards Awareness Project, Alliance to Save Energy, American Council for an Energy-Efficient Economy, Northwest Energy Efficiency Alliance, and Northwest Power and Conservation Council*.	Joint Advocates	EA.
Lennox International Inc	Lennox	M.
National Comfort Institute	NCI	IR.
Pacific Gas and Electric Company, Southern California Gas Company, San Diego Gas and Electric, and Southern California Edison.	California Investor-Owned Utilities (CA IOUs).	U.

EA: Efficiency/Environmental Advocate; IR: Industry Representative; M: Manufacturer; U: Utility.
* The Northwest Power and Conservation Council is an interstate compact agency, whose mission in part is to promote energy efficiency.

Following the July 2017 ASHRAE TP RFI, AHRI published additional updates to its test procedure standard for CRACs on December 21, 2017 (AHRI Standard 1360–2017, ''2017 Standard for Performance Rating of Computer and Data Processing Room Air Conditioners'' (AHRI 1360–2017)). ASHRAE published ASHRAE Standard

[4] More specifically, ASHRAE Standard 90.1–2016 references AHRI 1360–2016, ''Standard for Performance Rating of Computer and Data Processing Room Air Conditioners'' for CRACs.

[5] The parenthetical reference provides a reference for information located in a docket related to DOE's rulemaking to develop test procedures for CRACs. As noted, the July 2017 ASHRAE TP RFI addressed 4 different equipment categories and is available under docket number EERE–2017–BT–TP–0018. As this NOPR addresses only CRACs, it has been assigned a separate docket number (*i.e.,* EERE–2021–BT–TP–0017). The references are arranged as follows: (Commenter name, comment docket ID number, page of that document).

90.1–2019 on October 24, 2019, which updated the test procedure referenced for CRACs from AHRI 1360–2016 to AHRI 1360–2017 and added equipment classes for ceiling-mounted CRACs. Following the publication of ASHRAE Standard 90.1–2019, AHRI is currently working on an update to AHRI Standard 1360 (*i.e.,* AHRI Standard 1360–202X Draft, ''Performance Rating of Computer and Data Processing Room Air Conditioners (''Draft Standard'')'' (AHRI 1360–202X Draft)). These industry test standards are discussed further in section III.C of this NOPR.

II. Synopsis of the Notice of Proposed Rulemaking

In this NOPR, DOE proposes to update the Federal test procedure for CRACs consistent with the most recent draft version of the relevant industry consensus test procedure, AHRI 1360–202X Draft. If AHRI publishes a final version of AHRI 1360–202X Draft prior to DOE publishing a final rule, DOE intends to update the referenced industry test standard in the DOE test procedure to reference the latest version of AHRI 1360. If a finalized version of AHRI 1360–202X Draft is not published before the final rule or if there are substantive changes between the draft and published versions of AHRI 1360, DOE may adopt the substance of the AHRI 1360–202X Draft or provide additional opportunity for comment on the final version of that industry consensus standard. Specifically, DOE proposes to update its regulations at 10 CFR 431.96, ''Uniform test method for the measurement of energy efficiency of commercial air conditioners and heat pumps,'' as follows: (1) Incorporate by reference the updated version of AHRI 1360 and relevant industry standards referenced in that version of AHRI 1360; (2) establish provisions for determining NSenCOP for CRACs; (3) clarify the definition of ''computer room air conditioner'' to include consideration of how equipment is marketed; and (4) amend certain provisions for representations and enforcement in 10 CFR part 429, consistent with the changes proposed to the test procedure. In terms of implementation, DOE proposes to add new appendices E and E1 to subpart F of part 431, ''Uniform test method for measuring the energy consumption of computer room air conditioners,'' (appendix E and appendix E1, respectively). The current DOE test procedure for CRACs would be relocated to appendix E without change, and the new test procedure adopting the substance of AHRI 1360–202X Draft would be established in appendix E1 for determining NSenCOP. Compliance with appendix E1 would not be required until such time as compliance is required with amended energy conservation standards for CRACs that rely on NSenCOP, should DOE adopt such standards. After compliance with appendix E1 would be required, appendix E would no longer be used as part of the Federal test procedure.

DOE's proposed actions are summarized in Table II.1 and addressed in detail in section III of this document.

TABLE II.1—SUMMARY OF CHANGES IN PROPOSED TEST PROCEDURE RELATIVE TO CURRENT TEST PROCEDURE

Current DOE test procedure	Proposed test procedure	Attribution
Incorporates by reference ANSI/ASHRAE 127–2007.	Incorporates by reference in a new appendix E1- AHRI 1360–202X Draft, ANSI/ASHRAE 127–2020, and ANSI/ASHRAE 37–2009.	Updates to the applicable industry test procedures.
Includes provisions for determining SCOP	Includes provisions for determining NSenCOP	Updates to the applicable industry test procedures.
CRAC definition criteria include: (1) Used in computer rooms (or similar applications); (2) whether rated for SCOP and tested in accordance with 10 CFR 431.96; and (3) not a consumer product.	CRAC definition criteria include: (1) Marketed for use in computer rooms (or similar applications); and (2) not a consumer product.	To more clearly define CRACs and distinguish from other equipment categories.
Does not specify provisions specific to testing roof, wall, and ceiling-mounted CRAC units.	Defines roof, wall, and ceiling-mounted CRAC configurations and provides test provisions specific to such units.	Updates to the applicable industry test procedures.
Does not include CRAC-specific provisions for determination of represented values in 10 CFR 429.43.	Includes provisions in 10 CFR 429.43 specific to CRACs to determine represented values for units approved for use with multiple refrigerants, prescribe represented cooling capacity multiples, prevent cooling capacity over-rating, and specify configuration of unit under test.	Establish CRAC-specific provisions for determination of represented values.
Does not include CRAC-specific enforcement provisions in 10 CFR 429.134.	Adopts product-specific enforcement provisions for CRACs regarding verification of cooling capacity and configuration of unit under test.	Establish provisions for DOE testing of CRACs.

DOE has tentatively determined that the proposed amendments described in section III of this NOPR regarding the establishment of appendix E would not alter the measured efficiency of CRACs or require retesting solely as a result of DOE's adoption of the proposed amendments to the test procedure, if made final. DOE has tentatively determined, however, that the proposed test procedure amendments in appendix E1 would, if adopted, alter the measured efficiency of CRACs and that such amendments are consistent with the updated industry test procedure. Further, compliance with the proposed appendix E1 and the proposed amendments to the representation requirements in 10 CFR 429.43 would not be required until the compliance date of amended standards denominated in terms of NSenCOP. Additionally, DOE has tentatively determined that the proposed amendments, if made final, would not increase the cost of testing. Discussion of DOE's proposed actions are addressed in further detail in section III of this NOPR.

III. Discussion

A. Scope of Applicability

This rulemaking applies to CRACs. DOE defines ''computer room air conditioner'' as a basic model of commercial package air-conditioning and heating equipment (packaged or

split) that is: Used in computer rooms, data processing rooms, or other information technology cooling applications; rated for SCOP and tested in accordance with 10 CFR 431.96; and is not a covered consumer product under 42 U.S.C. 6291(1)–(2) and 42 U.S.C. 6292. A CRAC may be provided with, or have as available options, an integrated humidifier, temperature and/or humidity control of the supplied air, and reheating function. 10 CFR 431.92.

B. Proposed Organization of the CRAC Test Procedure

DOE is proposing to relocate and centralize the current test procedure for CRACs to a new appendix E to subpart F of 10 CFR part 431, without change. As proposed, appendix E would not amend the current test procedure. The test procedure as provided in proposed appendix E would continue to reference ANSI/ASHRAE 127–2007 and provide instructions for determining SCOP. Correspondingly, DOE is proposing to update the existing incorporation by reference of ANSI/ASHRAE 127–2007 at 10 CFR 431.95 so that the incorporation by reference applies to appendix E, rather than 10 CFR 431.96. The proposed appendix E would also centralize the additional test provisions currently applicable under 10 CFR 431.96 (*i.e.,* optional break-in period for tests conducted using ANSI/ASHRAE 127–2007 (currently at 10 CFR 431.96(c)) and additional provisions for equipment set-up (currently at 10 CFR 431.96(e)). As proposed, CRACs would be required to be tested according to appendix E until such time as compliance is required with an amended energy conservation standard that relies on the NSenCOP metric, should DOE adopt such a standard.

Accordingly, DOE also is proposing in parallel an amended test procedure for CRACs that adopts AHRI 1360–202X Draft in a new appendix E1 to subpart F of 10 CFR part 431. DOE proposes to adopt the substance of the updated draft version of AHRI 1360, including the NSenCOP metric, as discussed in the following sections. To this end, DOE intends to propose to incorporate by reference the final published version of AHRI 1360–202X Draft in the final rule, unless there are substantive changes between the draft and published versions, in which case DOE may adopt the substance of the AHRI 1360–202X Draft or provide additional opportunity for comment on changes presented in the final version of the industry consensus test standard. As proposed, CRACs would not be required to be tested according to the test procedure in proposed appendix E1 until such time as compliance is required with an amended energy conservation standard that relies on the NSenCOP metric, should DOE adopt such a standard.

C. Updates to Industry Test Standards

As noted previously, DOE's current test procedure for CRACs is codified at 10 CFR 431.96 and incorporates by reference ANSI/ASHRAE Standard 127–2007,[6] which is the test procedure recognized by ASHRAE Standard 90.1–2010 for CRACs. However, the most recent version of ASHRAE Standard 90.1 (*i.e.,* the 2019 edition) recognizes AHRI 1360–2017 as the test procedure for CRACs.

After publication of AHRI 1360–2017, DOE and other stakeholders supported the AHRI 1360 committee in its process to further update AHRI Standard 1360. DOE understands that this new update is currently in draft form (*i.e.,* AHRI 1360–202X Draft) and will supersede AHRI 1360–2017. AHRI 1360–202X Draft references ANSI/ASHRAE 127–2020, ''*Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners*'' (ANSI/ASHRAE 127–2020)[7] and ANSI/ASHRAE 37–2009, ''*Methods Of Testing For Rating Electrically Driven Unitary Air-Conditioning And Heat Pump Equipment* (ANSI/ASHRAE 37–2009). Both AHRI 1360–2017 and AHRI 1360–202X Draft include significant changes from ANSI/ASHRAE 127–2007, including the use of NSenCOP instead of SCOP as the test metric. Both efficiency metrics (NSenCOP and SCOP) are ratios of net sensible cooling capacity delivered to the power consumed, but there are several differences in the conditions at which tests are performed. Section III.E.1 of this NOPR includes further discussion of the differences between these test metrics.

In light of these updates to the relevant industry consensus standards, DOE is proposing to amend its test procedure for CRACs by incorporating by reference AHRI 1360–202X Draft (in its entirety). DOE intends to update its incorporation by reference to the final published version of AHRI 1360–202X Draft in the final rule, unless the draft version is not finalized before the final rule or if there are substantive changes between the draft and published versions, in which case DOE may adopt the substance of the AHRI 1360–202X Draft or provide additional opportunity for comment on the substantive changes to the updated industry consensus standard. Specifically, in the proposed test procedure for CRACs at 10 CFR part 431, subpart F, appendix E1, DOE is proposing to utilize sections 3.1, 3.4, 3.11, 3.14, 3.16, 3.17, 3.21–3.23, 5, 6.1–6.3, 6.5, 6.7, and Appendices C–F of AHRI 1360–202X Draft for the Federal test procedure for CRACs.[8]

DOE is also proposing to incorporate by reference several industry standards that are subsequently referenced by AHRI 1360–202X Draft. First, DOE is proposing to incorporate by reference ANSI/ASHRAE 127–2020. Specifically, in the proposed test procedure for CRACs at 10 CFR part 431, subpart F, appendix E1, DOE is proposing to utilize Figure A-1, *Test duct for measuring air flow and static pressure on downflow units,* of Appendix A of ANSI/ASHRAE 127–2020, because Figure A-1 of Appendix A is referenced in section 5.8 of AHRI 1360–202X Draft. Second, DOE is proposing to incorporate by reference ANSI/ASHRAE 37–2009 for 10 CFR part 431, subpart F, appendix E1, because section 5, Appendix D, and Appendix E of AHRI 1360–202X Draft reference methods of test in ANSI/ASHRAE 37–2009. More specifically, DOE is proposing to utilize all sections of ANSI/ASHRAE 37–2009, except sections 1, 2, and 4. (Any issues discussed in the July 2017 ASHRAE TP RFI that pertain to provisions in ANSI/ASHRAE 37–2009 are addressed in section III.F.4 of this NOPR.)

D. Definitions

1. CRAC Definition

As discussed, DOE currently defines a CRAC as a basic model of commercial package air-conditioning and heating equipment (packaged or split) that is: Used in computer rooms, data processing rooms, or other information technology cooling applications; rated for SCOP and tested in accordance with 10 CFR 431.96, and is not a covered consumer product under 42 U.S.C. 6291(1)–(2) and 42 U.S.C. 6292. 10 CFR 431.92. A computer room air conditioner may be provided with, or have as available options, an integrated humidifier, temperature and/or humidity control of the supplied air, and reheating function. *Id.* In defining a CRAC, DOE was unable to identify physical characteristics that consistently

[6] While ANSI/ASHRAE Standard 127–2007 is incorporated by reference in its entirety, Table 1 to 10 CFR 431.96 (which defines the applicable test methods for each category of equipment) excludes section 5.11 of ANSI/ASHRAE Standard 127–2007 for testing CRACs. The test procedure also includes additional provisions related to break-in period and test set-up. *See* 10 CFR 431.96(c) and (e).

[7] ASHRAE published ANSI/ASHRAE Standard 127–2020 on November 30, 2020.

[8] DOE notes that the most recent version of ASHRAE Standard 90.1–2019 references AHRI 1360–2017 as the industry consensus test method for CRACs.

distinguish CRACs from other categories of commercial package air conditioning and heating equipment that provide comfort-cooling. *See* 77 FR 16769, 16772–16774 (March 22, 2012); 77 FR 28928, 28947–28948 (May 16, 2012).

In an effort to better distinguish CRACs from other categories of commercial package air conditioning and heating equipment that provide comfort cooling, DOE is again considering means to consistently differentiate this equipment. To this end, DOE has considered as potential distinguishing factors use of a minimum sensible heat ratio (SHR) and the nominal airflow rate per ton of cooling capacity, as discussed further in this section. SHR is the ratio of sensible cooling capacity to the total cooling capacity. The total cooling capacity includes both sensible cooling capacity and latent cooling capacity.[9]

As part of the July 2017 ASHRAE TP RFI, DOE requested comment on the extent to which models of commercial package air conditioners are marketed and/or installed for use in both comfort cooling and computer room cooling applications. 82 FR 34427, 34430 (July 25, 2017). DOE also requested comment on whether there are models rated for Energy Efficiency Ratio (EER) or Seasonal Energy Efficiency Ratio (SEER), and not SCOP, that are used for computer room cooling. *Id.* DOE sought comment and data on whether a specific SHR value or any other design differences or performance features would effectively and consistently distinguish CRACs from other categories of commercial package air conditioners. *Id.*

In response to the July 2017 ASHRAE TP RFI, AHRI commented that some large unitary equipment, mini-split units, single packaged vertical units, and large direct and indirect evaporative coolers are used in data center applications. AHRI also noted that many of these products are custom-built for the application and are not necessarily designed for comfort cooling. The commenter added that in many instances, the consulting engineer and/or the end user determines the type of equipment used, regardless of how it is marketed. Additionally, AHRI stated that CRACs are uniquely designed to operate year-round only in cooling mode, and their efficiency rating should be stated as NSenCOP. (AHRI, No. 11 at pp. 1–2). DOE did not receive specific comments on whether there are models rated for EER or SEER, and not SCOP or NSenCOP, that are used for computer room cooling.

With regard to whether SHR could be used to effectively and consistently distinguish CRACs from other classes of commercial package air conditioners, AHRI commented that SHR is dependent on the rating conditions used for testing, coil design, and airflow rate of the unit. AHRI stated that SHRs for CRACs typically fall within a range of around 0.90–1.0, depending on which of the indoor air rating conditions specified for CRACs in AHRI 1360–2016 are used; whereas typical comfort cooling commercial units have an SHR of around 0.60 at the indoor air rating conditions specified for commercial unitary air conditioners (CUACs) in AHRI 340/360–2015 (which differ from CRAC rating conditions). AHRI added that CRACs obtain a higher SHR than CUACs by having a higher airflow rate per ton of cooling capacity,[10] and, thus, a larger fan motor. (AHRI, No. 11 at p. 2)

As part of preparing this NOPR, DOE conducted a preliminary review of performance data to explore the use of SHR to distinguish between CUACs and CRACs. DOE reviewed data from CUAC product literature [11] and DOE's Compliance Certification Database for CRACs,[12] which indicates that if CUACs were tested at the indoor air conditions specified in DOE's current test procedure for CRACs, there would be significant overlap in the ranges of SHR for CUAC models and CRAC models. Specifically, more than half of CRAC models certified to DOE would have an SHR that is also achieved by certain CUAC models. Additionally, DOE's analysis of rated cooling capacity and airflow rate data from DOE's Compliance Certification Database and the AHRI Directory of Certified Product Performance [13] revealed a substantial overlap in nominal airflow rate per ton of cooling capacity between CRACs and CUACs currently on the market. Therefore, DOE has tentatively concluded that neither SHR nor nominal airflow rate per ton of cooling capacity would provide a clear distinction between CRACs and CUACs.

Because DOE was unable to identify physical characteristics that could reliably be used to distinguish between CRACs and other equipment types, DOE is not proposing to define CRACs based on physical construction and/or component characteristics. Rather, DOE is proposing to amend the definition of CRAC to include how it is marketed for use by the manufacturer. Specifically, DOE is proposing first to replace the phrase ''used in computer rooms, data processing rooms, or other information technology cooling applications'' with ''marketed for use in computer rooms, data processing rooms, or other information technology cooling applications.'' DOE's proposed definition for CRACs is consistent with the definition in the latest draft industry standard, AHRI 1360–202X Draft, which also defines CRACs based on marketing.[14]

DOE also proposes to remove the current wording ''. . . rated for sensible coefficient of performance (SCOP) and tested in accordance with 10 CFR 431.96'' to ensure that a unit that otherwise meets the definition of a CRAC would be covered as a CRAC regardless of how the manufacturer has tested and rated the model. DOE also proposes to remove the unnecessary current wording ''. . . a basic model of'' to avoid confusion as to whether the equipment constitutes a basic model (*i.e.,* DOE specifies different basic model definitions for each equipment category at 10 CFR 431.92) before the determination is made whether the equipment meets the CRAC definition.

DOE proposes to maintain the existing requirement that a CRAC is not a covered consumer product under 42 U.S.C. 6291(1)–(2) and 42 U.S.C. 6292. DOE is also proposing to maintain the existing distinction that a CRAC may be provided with, or have as available options, an integrated humidifier, temperature, and/or humidity control of the supplied air, and reheating function.

In summary, DOE is proposing in 10 CFR 431.92 to define Computer Room Air Conditioner as ''commercial package air conditioning and heating equipment (packaged or split) that is: marketed for use in computer rooms, data processing rooms, or other information technology cooling applications; and not a covered

[9] Cooling load is composed of both sensible and latent portions. The sensible load is the energy required to reduce the temperature of the incoming air, without any phase change (*i.e.,* cooling). The latent load is the energy required to change the moisture in the air from water vapor into a liquid phase as it condenses on the cooling coil (*i.e.,* dehumidification).

[10] One ton of cooling capacity equals 12,000 Btu/h.

[11] Specifically, CUAC technical literature provided performance tables that show total cooling capacity and sensible cooling capacity at various indoor air conditions for each model.

[12] DOE's Compliance Certification Database does not contain sensible cooling capacity ratings for certified CUACs. (Available at: *www.regulations.doe.gov/ccms*).

[13] The AHRI Directory of Certified Product Performance is available at *www.ahridirectory.org.*

[14] Section 3.5 of AHRI 1360–202X Draft defines ''computer room air conditioner'' as a subset of ''computer and data processing room air conditioner.'' Section 3.4 of AHRI 1360–202X Draft defines ''computer and data processing room air conditioner,'' as an air conditioning unit specifically marketed for cooling data centers and information technology equipment.

consumer product under 42 U.S.C. 6291(1)–(2) and 42 U.S.C. 6292. A computer room air conditioner may be provided with, or have as available options, an integrated humidifier, temperature, and/or humidity control of the supplied air, and reheating function. Computer room air conditioners include, but are not limited to, the following configurations as defined in 10 CFR 431.92 down-flow, horizontal-flow, up-flow ducted, up-flow non-ducted, ceiling-mounted ducted, ceiling mounted non-ducted, roof-mounted, and wall-mounted.'' DOE is also proposing definitions for the configuration terms used in this proposed definition, as discussed further in the following section of this document. Further, regarding the ''marketed for'' criterion in the proposed definition, DOE proposes in 10 CFR 431.92 that DOE would consider any publicly-available document published by the manufacturer (*e.g.,* product literature, catalogs, and packaging labels) to determine the application for which equipment is marketed.

DOE recognizes that there may be units on the market that would be covered by DOE regulations for multiple equipment categories. As discussed in a previous notice addressing CRACs, such units would have to be tested and rated according to the requirements for each applicable equipment class of standards (*e.g.,* CRAC and CUAC). *See* 77 FR 16769, 16773 (March 22, 2012).

Issue 1: DOE requests comment on the proposed definition for ''computer room air conditioner'' that distinguishes between CRACs and other categories of air conditioning equipment, based on the marketing of the equipment.

2. CRAC Configuration Definitions

CRACs can be installed in a variety of different configurations, which vary by installation location, direction of airflow over the evaporator coil (*e.g.,* up, down, or horizontal), and by return and discharge air connections (*e.g.,* raised floor plenum, ducted, free air). AHRI 1360–202X Draft includes the concept of ''standard configurations'' to standardize the configuration and rating conditions (*e.g.,* ESP, return air temperature) for testing CRACs to generate standard ratings. Appendix C of AHRI 1360–202X Draft specifies eight different standard configurations: (1) Ceiling-mounted ducted (with ducted discharge and ducted return); (2) ceiling-mounted non-ducted (with free air discharge and free air return); (3) down-flow (with raised floor plenum discharge and free air return); (4) horizontal-flow (with free air discharge and free air return); (5) up-flow ducted (with ducted discharge and free air return); (6) up-flow non-ducted (with free air discharge and free air return); (7) wall-mounted (with free air discharge and free air return); and (8) roof-mounted ducted (with ducted discharge and ducted return).

Section C1 in Appendix C of AHRI 1360–202X Draft specifies that all units within the scope of the test standard must be categorized and rated as one of the eight standard configurations, and it specifies test conditions that vary between standard configurations. Standard configurations are further discussed in section III.F.1 of this NOPR.

Section 3.24 of AHRI 1360–202X Draft includes definitions for the following configurations of standard models: ''downflow unit,'' ''horizontal-flow unit,'' ''upflow unit–ducted,'' ''upflow unit–nonducted,'' ''ceiling mounted unit–ducted,'' ''ceiling-mounted unit–nonducted,'' ''wall-mounted,'' and ''roof-mounted ducted.'' Additionally, section 3.9.2 of AHRI 1360–202X Draft includes definitions for the following airflow configurations of floor-mounted CRACs: ''downflow,'' ''horizontal-flow,'' and ''upflow.''

To provide additional instruction as to which configuration (and, thus, which testing requirements and standards, as applicable) should be used for testing, DOE is proposing to add several definitions for CRACs consistent with the previously mentioned definitions in AHRI 1360–202X Draft. Specifically, DOE is proposing definitions for the following terms at 10 CFR 431.92: Floor-mounted, ceiling-mounted, wall-mounted, roof-mounted, up-flow, down-flow, horizontal flow, up-flow ducted, up-flow non-ducted, ceiling-mounted ducted, ceiling-mounted non-ducted, and fluid economizer. Because several of these proposed definitions reference other defined terms (*e.g.,* the ''up-flow non-ducted'' definition references the separately defined ''up-flow'' term), DOE is proposing to italicize the defined terms within CRAC-related definitions at 10 CFR 431.92 to signal to the reader which terms are separately defined. Each of these proposed definitions is discussed in further detail in the following sections.

Issue 2: DOE requests comment on its proposal to define the following terms, consistent with AHRI 1360–202X Draft: Floor-mounted, ceiling-mounted, wall-mounted, roof-mounted, up-flow, down-flow, horizontal flow, up-flow ducted, up-flow non-ducted, ceiling-mounted ducted, ceiling-mounted non-ducted, and fluid economizer.

a. Mounting Configurations

A variety of mounting configurations are available for CRACs. For CRACs for which the unit housing the evaporator coil is designed to be installed indoors (including both single package and split system CRACs), mounting configurations include floor-mounted, wall-mounted, and ceiling-mounted. Floor-mounted units are designed as free-standing units that are installed directly on a solid floor, a raised floor, or a floor-stand; wall-mounted units are designed for installation on or through a wall; and ceiling-mounted units are designed to be installed on or through a ceiling. Other CRACs are designed to be installed outdoors on a building rooftop or on a slab at ground level.

DOE proposes to adopt the definitions in AHRI 1360–202X Draft for ceiling mounted units, floor mounted units, roof mounted units, and wall mounted units, with one minor modification. Specifically, DOE proposes to replace the phrase ''Indoor Unit'' with ''unit housing the evaporator coil'' to avoid the need for defining another term (*i.e.,* ''Indoor Unit'') in the Federal regulations. Section 3.11 of AHRI 1360–202X Draft specifies that ''Indoor Unit'' for a split system is the unit that removes heat from the indoor air stream. DOE has tentatively concluded that ''the unit removing heat from the indoor air stream'' and ''the unit housing the evaporator coil'' are substantively identical for CRACs—the only distinction would be for computer room air handlers, which remove heat from the airstream via a chilled water coil and thus do not have an evaporator coil. Because DOE does not regulate air handlers, DOE is proposing to use the phrase ''housing the evaporator coil'' to describe more narrowly the indoor unit of a CRAC split system.

DOE proposes the following definitions for CRAC mounting configurations at 10 CFR 431.92. These definitions are referenced by other proposed CRAC configuration definitions described in the sections that follow.

Floor-mounted means a configuration of *computer room air conditioner* for which the unit housing the evaporator coil is configured for indoor installation on a solid floor, raised floor, or floor-stand. Floor-mounted *computer room air conditioners* are one of the following three configurations: *Down-flow, horizontal-flow,* or *up-flow.*

Ceiling-mounted means a configuration of *computer room air conditioner* for which the unit housing the evaporator coil is configured for

indoor installation on or through a ceiling.

Wall-mounted means a configuration of *computer room air conditioner* for which the unit housing the evaporator coil is configured for installation on or through a wall.

Roof-mounted means a configuration of *computer room air conditioner* that is not *wall-mounted,* and for which the unit housing the evaporator coil is configured for outdoor installation.

b. Flow Direction

DOE is proposing to adopt the definitions in AHRI 1360–202X Draft for ''up-flow,'' ''down-flow,'' and ''horizontal-flow'' CRAC configurations, with minor additions to: (1) Clarify that these provisions apply only to floor-mounted CRACs because other types of CRACs (*i.e.,* ceiling-mounted, roof-mounted, and wall-mounted CRACs) each only have one possible airflow direction through the unit; and (2) replace the term ''cooling coil'' with ''evaporator coil'' to more specifically reference the relevant coil, because a fluid economizer coil could also be considered a ''cooling coil.'' The limitation of scope of these definitions to floor-mounted CRACs is consistent with Section 3.9.2 of AHRI 1360–202X Draft, which includes these as sub-definitions under the definition for ''floor-mounted unit.''

DOE proposes the following definitions regarding the airflow direction for CRACs at 10 CFR 431.92:

Up-flow means a configuration of *floor-mounted computer room air conditioner* in which return air enters below the bottom of the evaporator coil and discharge air leaves above the top of the evaporator coil.

Down-flow means a configuration of *floor-mounted computer room air conditioner* in which return air enters above the top of the evaporator coil and discharge air leaves below the bottom of the evaporator coil.

Horizontal-flow means a configuration of *floor-mounted computer room air conditioner* that is neither a *down-flow* nor an *up-flow* unit.

c. Ducted and Non-Ducted Definitions

The definitions in Section 3.19 of AHRI 1360–2017 distinguish between ducted and non-ducted up-flow units based on the presence of factory-installed air discharge grills or factory-installed supply air plenums. Certain floor-mounted units, ceiling-mounted units, and wall-mounted units can be installed either with or without a duct, depending on the needs of the installation of the unit in the field. In the July 2017 ASHRAE TP RFI, DOE noted that AHRI 1360–2016 does not provide express instructions on which up-flow standard model requirements would be used for testing equipment that can be installed either with or without a duct. DOE requested comment on which equipment characteristics can be used to determine whether up-flow CRACs should be tested as ducted or non-ducted models. DOE also requested comment on whether up-flow units can be sold for both up-flow ducted and up-flow non-ducted applications, and whether such models are currently tested using both ducted and non-ducted rating conditions. 82 FR 34427, 34432–34433 (July 25, 2017).

In addition, as discussed in the July 2017 ASHRAE TP RFI, DOE's review of CRAC installation manuals suggests that some up-flow units are installed with a plenum that directs the vertical airflow exiting the top of the unit to a horizontal direction (*e.g.,* either toward the front or rear of the unit). DOE requested comment on the percentage of up-flow CRAC installations in which a plenum is attached, and whether non-ducted units are tested with or without this plenum. 82 FR 34427, 34434 (July 25, 2017).

In response to the July 2017 ASHRAE TP RFI, AHRI stated that up-flow units that can be installed with ducting or with an air discharge plenum would use more energy in the ducted configuration and should, therefore, be tested and rated as ducted. The commenter argued that testing and rating a unit as both ducted and non-ducted would add unnecessary testing burden on manufacturers. AHRI further stated that only units with factory-integrated discharge grills should be tested as non-ducted. (AHRI, No. 11 at p. 4)

AHRI also commented that if an up-flow unit is not shipped with an integral factory grill, it should be considered an up-flow ducted unit and that such units are currently tested with a duct regardless of whether they have a plenum installed or are ducted in the field. AHRI further added that approximately 33 percent of up-flow ducted units use a manufacturer's plenum to redirect the air from the upward direction, while the remaining 67 percent may be installed with ducting in the field. (AHRI, No. 11 at p. 6).

This issue was addressed with changes in AHRI 1360–202X Draft. The definitions in Sections 3.3.1 and 3.9.1 of AHRI 1360–202X Draft distinguish between ducted and non-ducted ceiling mounted and up-flow floor mounted units based on the marketing of the unit. Specifically, a unit that is marketed only for use without discharge ducting is classified as a non-ducted unit and a unit that is marketed for use with discharge ducting (but may also be marketed for use without discharge ducting) is classified as a ducted unit.

DOE is proposing to include definitions consistent with AHRI 1360–202X Draft that differentiate between ducted and non-ducted units, with only minor modifications. The modifications are to simplify the definitions and remove unnecessary phrases. For example, the definitions for ''ducted discharge'' and ''free air discharge'' in Section 3.9.1 of AHRI 1360–202X Draft apply to both up-flow and down-flow units and specify that the terms exclude units that are ''raised floor plenum discharge.'' The explicit exclusion of units that are ''raised floor plenum discharge'' applies only to down-flow units because an up-flow unit discharges air near the top of the unit and would, therefore, never discharge air into a raised floor plenum. Consequently, this exclusion is unnecessary in DOE's proposed definitions for ''up-flow ducted'' and ''up-flow non-ducted.''

In summary, DOE proposes the following definitions at 10 CFR 431.92 that differentiate between ducted and non-ducted units for up-flow and ceiling-mounted CRACs:

Up-flow ducted means a configuration of an *up-flow computer room air conditioner* that is configured for use with discharge ducting (even if the unit is also configurable for use without discharge ducting).

Up-flow non-ducted means a configuration of an *up-flow computer room air conditioner* that is configured only for use without discharge ducting.

Ceiling-mounted ducted means a configuration of *ceiling-mounted computer room air conditioner* that is configured for use with discharge ducting (even if the unit is also configurable for use without discharge ducting).

Ceiling-mounted non-ducted means a configuration of *ceiling-mounted computer room air conditioner* that is configured only for use without discharge ducting.

d. Fluid Economizer

Section 3.10 of AHRI 1360–202X Draft specifies a definition for ''fluid economizer,'' which it defines (in part) as an option available to CRACs or computer room air handler systems. DOE is proposing to adopt the following definition for ''fluid economizer'' at 10 CFR 431.92, which is consistent with the definition used by AHRI 1360–202X Draft, except that it does not include computer room air handlers because

these air handlers (*i.e.,* chilled water coils) do not meet DOE's definition for ''commercial package air conditioning and heating equipment'' at 10 CFR 431.92.

Fluid Economizer means an option available with a *computer room air conditioner* in which a fluid (other than air), cooled externally from the unit, provides cooling of the indoor air to reduce or eliminate unit compressor operation when outdoor temperature is low. The fluid may include, but is not limited to, chilled water, water/glycol solution, or refrigerant. An external fluid cooler, such as but not limited to a dry cooler, cooling tower, or condenser, is utilized for heat rejection. This component is sometimes referred to as a free cooling coil, econ-o-coil, or economizer.

E. Metric

1. NSenCOP

DOE's current efficiency metric for CRACs is SCOP, which is a ratio of cooling capacity delivered to the power consumed. For most categories of air conditioners and heat pumps other than CRACs, the efficiency metrics are calculated based on total cooling capacity (which includes both sensible cooling and latent cooling). However, unlike the conditioned spaces in most commercial buildings, computer rooms and data centers typically have limited human occupancy and minimal dehumidification requirements, and thus, primarily require only sensible cooling. Therefore, SCOP is calculated based on sensible cooling capacity rather than total cooling capacity.

As discussed, ASHRAE Standard 90.1–2016 amended the efficiency metric for CRACs from SCOP (measured per ANSI/ASHRAE 127–2007) to NSenCOP (measured per AHRI 1360–2016). ASHRAE Standard 90.1–2019 subsequently retained NSenCOP as the test metric, but it updated the test reference to AHRI 1360–2017 (which specifies NSenCOP as the test metric and has the same test conditions as AHRI 1360–2016). AHRI 1360–202X Draft also specifies NSenCOP as the test metric and maintains the rating conditions found in AHRI 1360–2017, while also adding rating conditions for roof-mounted and wall-mounted units. Like SCOP, NSenCOP is a ratio of sensible cooling capacity to the power consumed. However, the test procedure to determine NSenCOP differs from that to determine SCOP in four key aspects: (1) For several CRAC configurations (*e.g.,* down-flow, up-flow ducted), different indoor entering air temperatures are specified; (2) for water-cooled CRACs, different entering water temperatures are specified; (3) for up-flow ducted configurations, different indoor air external static pressure (ESP) requirements are specified; and (4) for water-cooled and glycol-cooled CRACs, NSenCOP accounts for energy consumed by fans and pumps that would be installed in the outdoor heat rejection loop, which is not accounted for in SCOP. Because of these key differences, the SCOP and NSenCOP metrics are not equivalent and would result in different ratings. As noted, the current energy conservation standards for CRACs are in terms of SCOP, and testing according to the DOE test procedure to determine SCOP would continue to be required until such time as the energy conservation standards are amended to rely on NSenCOP, should DOE adopt such changes to the standards. Each of the differences between SCOP and NSenCOP is discussed in further detail in the following paragraphs.

a. Indoor Entering Air Temperatures

ANSI/ASHRAE 127–2007 (for SCOP) specifies using a return air temperature (*i.e.,* indoor entering air temperature) of 75 °F for all CRAC configurations. However, in the field, the location of the return air inlet can impact the return air temperature. For example, CRAC configurations in which the return air inlet is located close to the heat source (*i.e.,* horizontal flow units, which are typically located adjacent to server racks) would have higher entering air temperatures than configurations with return air inlets located further from the heat source. In general, increasing the indoor entering air temperature (assuming all other parameters remain unchanged) increases the measured sensible cooling capacity and sensible cooling efficiency. In contrast, AHRI 1360–202X Draft (for NSenCOP) specifies different return air temperatures for different configurations. Specifically, AHRI 1360–202X Draft specifies indoor entering air dry-bulb temperatures for each CRAC configuration, as follows: (1) 85 °F for up-flow ducted units, down-flow units, and roof-mounted units; (2) 95 °F for horizontal-flow units; and (3) 75 °F for up-flow non-ducted units, ceiling-mounted ducted units, ceiling-mounted non-ducted units, and wall-mounted units.

b. Entering Water Temperatures

For water-cooled CRACs, ANSI/ASHRAE 127–2007 (for SCOP) specifies an entering water temperature of 86 °F, whereas AHRI 1360–202X Draft (for NSenCOP) specifies an entering water temperature of 83 °F. In general, decreasing the entering water temperature increases the measured efficiency.

c. Indoor Air ESP Requirements

For up-flow ducted CRACs, both ANSI/ASHRAE 127–2007 and AHRI 1360–202X Draft specify indoor air ESP requirements that vary with net sensible cooling capacity. AHRI 1360–202X Draft specifies lower ESP requirements than ANSI/ASHRAE 127–2007 across all capacity ranges, and the capacity bins (*i.e.,* capacity ranges over which each ESP requirement applies) are different between the two test standards. Testing with a lower ESP typically decreases the indoor fan power input without a corresponding decrease in cooling capacity, thus increasing the measured efficiency. Additionally, the reduction in fan heat entering the indoor air stream that results from lower fan power also slightly increases net sensible cooling capacity (NSCC). These indoor air ESP requirements are further discussed in section III.F.6 of this NOPR.

d. Energy Consumption of Heat Rejection Components

For air-cooled CRACs, all energy consumption associated with heat rejection (*i.e.,* transfer of heat that is captured from the conditioned space to outdoor air) is directly captured under both ANSI/ASHRAE 127–2007 and AHRI 1360–202X Draft because the units include the condenser fan(s) as integral components. However, for water-cooled CRACs and glycol-cooled CRACs, the energy consumption associated with heat rejection components (*i.e.,* liquid pump and cooling tower/dry cooler fan(s)) is not captured in either test method, because the heat rejection components for these CRACs are not integral components. However, Section 6.3.1 of AHRI 1360–202X Draft requires that an allowance for the power input of these components be added to the total power input used to determine NSenCOP. Specifically, Section 6.3.1.3 of AHRI 1360–202X Draft requires that an allowance be added for cooling tower fan(s) and water pump power input of water-cooled CRACs equal to 5 percent of the measured unit net sensible cooling capacity, and Section 6.3.1.4 of AHRI 1360–202X Draft requires that an allowance be added for dry cooler fan(s) and glycol pump power input of glycol-cooled CRACs equal to 7.5 percent of the measured unit net sensible cooling capacity. ANSI/ASHRAE 127–2007 does not include any such adjustments to account for the power consumption of

these heat rejection components in the power input used to calculate SCOP. The addition of these allowances does not change how the test is conducted, but the resulting changes to the efficiency ratings would more fully capture field energy consumption and allow for more representative comparison of water-cooled and glycol-cooled CRACs with air-cooled CRACs.

e. Conclusion

In response to the changes to the efficiency metric and referenced industry test standard for CRACs in ASHRAE Standard 90.1–2019 and the draft update to the referenced industry test standard (AHRI 1360–202X Draft), DOE proposes to update its efficiency metric for CRACs to NSenCOP. As discussed in section I.A of this NOPR, this approach is consistent with the general statutory scheme in EPCA to adopt an amended test procedure that is consistent with the updated relevant industry test procedure referenced in ASHRAE Standard 90.1. As part of any future analysis of energy conservation standards for CRACs, DOE would expect to conduct a crosswalk analysis to translate the current Federal standards in terms of SCOP to equivalent levels in terms of NSenCOP to evaluate potential amendments to the energy conservation standards, as appropriate.

Updating the industry consensus standard referenced in the DOE test procedure for CRACs to the draft updated version of the industry standard (*i.e.,* AHRI 1360–202X Draft), would require DOE to change the metric for CRACs from SCOP to NSenCOP. As noted, the energy conservation standards for CRACs are in terms of SCOP, and testing according to the DOE test procedure to determine SCOP would continue to be required until such time as the energy conservation standards are amended to rely on NSenCOP, should DOE adopt such changes to the standards. Further, DOE is unaware of any data or information indicating that NSenCOP test conditions are not representative of an average CRAC use cycle, but the Department requests comments, data, and information as to this understanding.

Issue 3: DOE requests comment on its proposal to adopt the NSenCOP metric for CRACs as part of the proposed test procedure in appendix E1, which would be used only if DOE were to prescribe energy conservation standards denominated in terms of NSenCOP in a future rulemaking. Additionally, DOE seeks feedback on whether the rating conditions in AHRI 1360–202X Draft are appropriately representative of field applications.

2. Integrated Efficiency Metric

In contrast to an efficiency metric that measures performance at only one test point, an annualized, or ''integrated'' efficiency metric measures performance at multiple test points (*i.e.,* tests with different outdoor test conditions) that are intended to reflect seasonal variation in outdoor ambient temperatures that would be experienced by the equipment installed in the field. ANSI/ASHRAE 127–2007 includes an integrated efficiency metric (*i.e.,* adjusted sensible coefficient of performance (ASCOP)—a metric for which DOE does not require manufacturers to report ratings), which is calculated based on the SCOP determined at four different rating conditions (A, B, C, and D) that represent different ambient conditions, with weightings for the SCOP at each rating condition based on the climate at a specific location. All subsequent versions of CRAC industry standards (*i.e,* 2012 and 2020 versions of ASHRAE Standard 127; 2013, 2016, 2017, and draft versions of AHRI Standard 1360) include a different integrated efficiency metric—integrated net sensible coefficient of performance (iNSenCOP). The iNSenCOP metric is similar to ASCOP in that it comprises a weighted average of NSenCOP values for four test points at varying outdoor conditions.[15] Additionally, iNSenCOP includes the weightings for each test point, whereas for ASCOP, ANSI/ASHRAE 127–2007 does not provide the weightings for each test point, and instead specifies obtaining data from a weather bureau or other reputable source to develop weightings for each ASCOP test point.

The ASCOP and iNSenCOP test methods in the CRAC industry consensus test standards require units to maintain a constant sensible cooling capacity at lower ambient temperatures. However, as the ambient temperature decreases, the maximum cooling capacity of a CRAC will inherently increase as the condensing temperature decreases. The CRAC industry consensus test standards do not provide direction regarding how the unit should be controlled to deliver the same amount of sensible cooling as its capacity increases for the lower-ambient tests. AHRI 1360–2017 acknowledges that it may be difficult to maintain test conditions within tolerance while operating at the full-load cooling load at reduced ambient temperatures, but does not provide direction regarding how the unit should be controlled. In the July 2017 ASHRAE TP RFI, DOE requested comment on whether it should consider adopting an integrated efficiency metric (*e.g.,* iNSenCOP) and, if so, how the requirement to maintain a constant sensible cooling capacity associated with the iNSenCOP test procedure should be implemented during testing. 82 FR 34427, 34432 (July 25, 2017).

In response, AHRI stated that an annualized energy efficiency metric such as iNSenCOP would best represent the energy efficiency of CRACs. However, AHRI stated that testing limitations currently prevent the development of an iNSenCOP metric. AHRI further commented that it had begun work to assess the feasibility of an annualized metric that can be verified by testing, but that this research would not be completed in time for inclusion in the 2017 version of AHRI 1360. Consequently, AHRI recommended that this issue be addressed at a later date. (AHRI, No. 11 at p. 3)

Consistent with AHRI's comment, section D1 of AHRI 136–2017 (and section G1 of the subsequently published AHRI 1360–202X Draft) states that ''a long-term goal is for iNSenCOP to replace NSenCOP after a more readily testable means has been standardized.'' DOE is not aware of any test data that verifies the validity of the iNSenCOP metric. Further, minimum efficiency levels in terms of iNSenCOP have not been adopted in ASHRAE Standard 90.1. The Department acknowledges the potential benefit regarding representativeness that would be provided with an annualized metric for CRACs. However, given the apparent need for further validation and the lack of test data, DOE is not proposing to use the iNSenCOP metric at this time.

3. Part-Load Operation and Air Circulation Mode

As discussed in the July 2017 ASHRAE TP RFI, CRACs typically operate at part-load (*i.e.,* less than designed full cooling capacity) in the field. 82 FR 34427, 34432 (July 25, 2017). Reasons for this may include, but are not limited to, redundancy in installed units to prevent server shutdown if a CRAC unit stops working, and server room designers building in extra cooling capacity to accommodate additional server racks in the future. While the current DOE test procedure measures performance at full-load, DOE has estimated that CRACs operate on average at a sensible load of 65 percent

[15] The rating conditions A, B, C, and D specified for ASCOP in ANSI/ASHRAE 127–2007 and for iNSenCOP in subsequent CRAC industry test standards (*i.e.,* 2012 and 2020 versions of ASHRAE Standard 127; 2013, 2016, 2017, and 202X Draft versions of AHRI Standard 1360) for air-cooled units correspond to outdoor entering air temperatures of 95.0 °F, 80.0 °F, 65.0 °F, and 40.0 °F, respectively.

of the full-load sensible capacity in the analysis for a final rule for standards and test procedures for certain commercial heating, air conditioning, and water heating equipment (including CRACs) published on May 16, 2012 (77 FR 28928). (Technical Support Document, EERE–2011–BT–STD–0029–0021, pp. 4–15, 4–16) In the July 2017 ASHRAE TP RFI, DOE requested information on the range of typical field load levels for CRACs at conditions close to or at the maximum ambient outdoor air temperature conditions specified in the DOE test procedure for various unit capacities. DOE also sought input on typical rules of thumb for oversizing and whether the issue of oversizing of this equipment should be addressed in the efficiency metric. 82 FR 34427, 34432 (July 25, 2017).

Additionally, as discussed in the July 2017 ASHRAE TP RFI, many CRACs operate in air circulation mode. 82 FR 34427, 34432 (July 25, 2017). In this mode, the direct expansion refrigerant system is shut down, and only the indoor fans and controls are operating. In a computer room with redundant CRAC units installed, one or more of the redundant units can be operated in air circulation mode to provide increased air movement. In the July 2017 ASHRAE TP RFI, DOE requested comment on the conditions under which CRACs typically operate in air circulation mode (*i.e.,* operating the indoor fan without actively cooling) in the field, whether each CRAC switches automatically between standard cooling mode and air circulation mode, and if so, the time percentage that CRACs operate in air circulation mode. DOE also sought comment on which fan setting(s) is used for air circulation mode and whether DOE should consider this energy use in the CRAC efficiency metric. *Id.*

The CA IOUs encouraged DOE to adopt an efficiency metric for CRACs that includes part-load conditions, stating that a full-load metric is highly unrepresentative of operation of CRACs in the field. Specifically, the CA IOUs stated that because computer rooms are built out in stages, CRACs may be sized for loads that are far greater than the loads actually met in practice, and that redundant and oversized CRACs are typically installed to ensure the continuous operation of these critical facilities. These commenters further stated that CRACs typically operate at between 10 percent and 50 percent of full-load capacity. Therefore, the CA IOUs recommended that DOE should modify the iNSenCOP metric to account for part-load operation in addition to variations in ambient conditions, or that DOE should develop a new integrated metric that includes part-load test points. (CA IOUs, No. 3 at pp. 3–4)

The Joint Advocates urged DOE to adopt an efficiency metric for CRACs that incorporates part-load performance, stating that a full-load metric is not representative of performance in the field and, therefore, does not provide good information to consumers. Additionally, the Joint Advocates stated that if CRACs spend a significant amount of time in air circulation mode, the energy use for that operating mode should be captured in the test procedure. These commenters also stated that variable-speed controls for fans and compressors can significantly improve performance when operating at part-load conditions or in air circulation mode, and that capturing these benefits in the test procedure would likely increase adoption of these technologies. The Joint Advocates acknowledged that measuring power consumption in air circulation mode would require additional testing, but suggested that the test burden would be small and that testing of air circulation mode could be performed immediately following the refrigeration system testing, similar to what is specified in the new test procedures for testing dehumidifiers in ''off-cycle'' mode. (Joint Advocates, No. 9 at pp. 2–3)

AHRI stated that oversizing of CRACs varies from site to site and depends on several factors such as redundancy, control sequencing, and the build-out plan. Because of such variations, AHRI stated that it is neither practical nor feasible to address oversizing in the efficiency metric for CRACs. AHRI did not comment on whether energy use from air circulation mode should be reflected in the CRAC efficiency metric, but stated that airflow is a major consideration in the design of a data center cooling system and that the control of airflow depends on how the data center is designed. The trade association stated that circulating fan speeds (in the case of variable-speed fans) are controlled by aisle temperatures, rack temperatures, static pressure, and supply air or return air temperatures; and that the industry has gone to great lengths to address airflow design and control issues. AHRI further commented that in many cases, the controls can be adjusted manually in a matter of seconds to respond to server equipment or load changes in the room. (AHRI, No. 11 at p. 4)

These comments suggest that CRACs are commonly oversized when installed in the field, and that this oversizing can significantly influence performance. DOE acknowledges that the extent of oversizing of CRACs likely varies by application, but DOE tentatively disagrees with AHRI's statement that it is neither practical nor feasible to account for oversizing in an efficiency metric for CRACs. For example, the ESP that indoor fans must overcome from ductwork varies widely by installation location, yet all versions of AHRI Standard 1360 specify ESP requirements to be used for testing all CRACs. Additionally, DOE understands that many CRACs operate in air circulation mode and that incorporating air circulation mode in testing might incentivize use of more-efficient fan technologies for CRACs that typically operate at lower fan speeds in air circulation mode. At this time, however, DOE does not have information or data on part-load or air circulation mode operation of CRACs to support a proposal to amend the efficiency metric to account for performance in these operating modes.

F. Test Method

This section discusses certain issues related to testing CRACs, several of which were identified by DOE in the July 2017 ASHRAE TP RFI and subsequently addressed in AHRI 1360–202X Draft. Therefore, in this section, comments received regarding such issues are briefly summarized and cited but are addressed by referencing the relevant language in AHRI 1360–202X Draft.

1. Standard Configurations

Section 3.18 of AHRI 1360–2016 specifies four floor-mounted ''standard model'' configurations to standardize rating conditions (*e.g.,* ESP, return air temperature) based on the configuration of a unit. These four ''standard model'' configurations are: Up-flow ducted, up-flow non-ducted, down-flow, and horizontal-flow. Section C1 of Appendix C of AHRI 1360–2016 categorizes all units within the scope of the test as one of the four floor-mounted ''standard model'' configurations, and Table C1 of AHRI 1360–2016 specifies the indoor rating conditions for each ''standard model'' configuration. Table C1 of AHRI 1360–2016 also identifies 13 ''application configurations,'' which are optional test configurations and are not specified for use in developing efficiency ratings.

As part of the July 2017 ASHRAE TP RFI, DOE requested confirmation that, although floor-mounted CRACs may be sold to be installed in multiple configurations, all models are capable of being tested as one of the four floor-mounted standard models identified in Table C.1 of AHRI 1360–2016. 82 FR 34427, 34433 (July 25, 2017).

In response to the July 2017 ASHRAE TP RFI, AHRI stated that all floor-mounted models can be configured as one of the four floor-mounted standard models specified in AHRI 1360–2016 and tested accordingly. AHRI also added that some air discharge unit variations may require special test set-ups, but did not elaborate on this issue. (AHRI, No. 11 at p. 4)

AHRI 1360–2017 specifies six ''standard model'' configurations and includes ceiling-mounted ducted and ceiling-mounted non-ducted ''standard model'' configurations, in addition to the four floor-mounted ''standard model'' configurations in AHRI 1360–2016. AHRI 1360–202X Draft includes a similar concept but designates the configurations as ''standard configurations'' rather than ''standard models.'' In addition to the six configurations specified as ''standard models'' in AHRI 1360–2017, Sections 3.25 and C1 (to Appendix C) of AHRI 1360–202X Draft include two additional standard configurations for wall-mounted and roof-mounted CRACs. Tables C1 and C2 to Appendix C of AHRI 1360–202X Draft specify these eight standard configurations, as well as 14 ''application configurations,'' which Section 3.2 of AHRI 1360–202X Draft defines as unit configurations other than standard configurations. However, Section 3.2 of AHRI 1360–202X Draft states that all units within the scope of AHRI Standard 1360 shall be tested and rated as standard configurations. Accordingly, for each application configuration, Note 2 to Table C1 and Notes 3 through 5 to Table C2 of AHRI 1360–202X Draft assign a specific standard configuration to be used for rating purposes.

In light of the provisions in AHRI 1360–202X Draft regarding standard configurations for testing CRACs, DOE surmises that the approach provided in AHRI 1360–202X Draft represents industry consensus regarding the most appropriate and representative configurations for testing. To the extent that AHRI had any concerns regarding special test set-ups needed for certain unit variations (as set forth in the comments in response to the July 2017 ASHRAE TP RFI), DOE presumes that AHRI's original position on this issue changed during the course of developing the updated industry consensus standard. DOE is proposing to adopt the provisions regarding standard configurations to be used for testing under AHRI 1360–202X Draft.

2. Ceiling-Mounted CRACs

The CRAC industry test standard referenced in DOE's current test procedure in 10 CFR 431.96, ANSI/ASHRAE 127–2007 (omitting section 5.11), is not specific as to mounting location (*i.e.,* floor, ceiling, wall, roof). However, on October 7, 2015, DOE issued a draft guidance document (''October 2015 Draft Guidance'') to clarify that ceiling-mounted CRACs are covered equipment and are required to be tested under the current DOE test procedure for purposes of making representations of energy consumption. DOE also noted that a manufacturer may request a test procedure waiver for a basic model if it contains design features that prevent testing according to the DOE test procedure. (Docket No. EERE–2014–BT–GUID–0022, No. 3, pp. 1–2) [16]

In the July 2017 ASHRAE TP RFI, DOE requested comment on the appropriate test procedure for ceiling-mounted CRACs and the test burden associated with any such procedure. 82 FR 34427, 34431 (July 25, 2017). DOE also noted that ANSI/ASHRAE 127–2007 and ANSI/ASHRAE 127–2012 do not exclude ceiling-mounted CRACs, but that AHRI 1360–2016 (the latest version of AHRI 1360 at the time of the July 2017 ASHRAE TP RFI) provides test provisions and rating conditions only for floor-mounted CRACs. 82 FR 34427, 34430–34431 (July 25, 2017). Further, DOE noted that the current DOE test procedure, which incorporates by reference ANSI/ASHRAE 127–2007, specifies different test conditions (*e.g.,* different ESP) than AHRI 1360–2016, and the Department requested comment on whether the test requirements of ANSI/ASHRAE 127–2007 are representative of average use cycles for ceiling-mounted CRACs. 82 FR 34427, 34433–34434 (July 25, 2017). In the July 2017 ASHRAE TP RFI, DOE requested information on whether the ESP levels required by ANSI/ASHRAE 127–2012 (which is referenced by AHRI 1360–2016) are representative of field operation for ceiling-mounted CRACs (among other non-floor-mounted CRAC configurations), and if not, what a representative minimum ESP would be. 82 FR 34427, 34434 (July 25, 2017).

In response, AHRI commented that AHRI 1360 was under revision (at the time of the response) and that an updated version would be published in 2017 (*i.e.,* AHRI 1360–2017). AHRI stated that the revised version would specify ESP requirements for ceiling-mounted CRACs. AHRI provided a working draft of AHRI 1360–2017 as part of its comment response. (AHRI, No. 11 at p. 6) AHRI also stated that the average use cycle for ceiling-mounted CRAC units and other non-floor-mounted CRACs would be the same as floor-mounted units. (AHRI, No. 11 at p. 5)

AHRI 1360–202X Draft includes ceiling-mounted units within the scope of the industry consensus test standard and specifies ducting configuration (*e.g.,* ducted discharge and ducted return) requirements in section 3.3.1, indoor entering air temperature in Table 3, and ESP requirements that apply specifically to ceiling-mounted units in Table 5 of that standard. These configurations and conditions align with those included for ceiling-mounted CRACs in the working draft of AHRI 1360–2017 provided as part of AHRI's comment response. Accordingly, DOE surmises that the approach provided in AHRI 1360–202X Draft represents industry consensus regarding the most appropriate and representative method for testing ceiling-mounted CRACs. Further, from DOE's initial review of public product literature for ceiling-mounted CRACs, DOE has tentatively determined that the ESP requirements for ceiling-mounted CRACs in AHRI 1360–202X Draft are more representative for testing ceiling-mounted CRACs than the ESP requirements specified in ANSI/ASHRAE 127–2007 (as provided in the October 2015 Draft Guidance Document). Therefore, DOE is proposing to adopt the provisions in AHRI 1360–202X Draft regarding testing ceiling-mounted CRACs. If DOE adopts the proposed test procedures for ceiling-mounted CRACs, DOE expects that this update to the industry consensus standard would obviate the need to update/finalize DOE's draft guidance document on this issue. (Docket No. EERE–2014–BT–GUID–0022, No. 3, pp. 1–2)

3. Non-Floor Mounted CRACs

The current DOE test procedure (which references ANSI/ASHRAE 127–2007) does not provide specific directions for testing wall-mounted or roof-mounted CRACs (although they are not excluded from ANSI/ASHRAE 127–2007). In the July 2017 ASHRAE TP RFI, DOE requested information on the extent to which single-package non-floor-mounted air conditioners are used in computer room applications. DOE also requested comment on whether special test procedure provisions should be developed for different kinds of single-package non-floor-mounted air conditioners that are used for computer room cooling. 82 FR 34427, 34431 (July 25, 2017).

In response to the July 2017 ASHRAE TP RFI, AHRI stated that it did not have

[16] Available at: *www.regulations.gov/docket?D=EERE-2014-BT-GUID-0022.*

information on the extent to which single-package non-floor-mounted air conditioners are used in computer room applications. AHRI further stated that it has not studied test provisions for single-package non-floor-mounted CRACs in-depth, but commented that these units could be tested by combining the test set-up(s) used for testing air conditioners intended for comfort cooling applications with the rating conditions specified for CRACs in AHRI 1360. (AHRI, No. 11 at pp. 2–3)

AHRI 1360–202X Draft includes wall-mounted and roof-mounted units in the scope of the test standard and provides rating and test conditions for these units. In light of the provisions in AHRI 1360–202X Draft regarding testing wall-mounted and roof-mounted CRACs, DOE surmises that the approach provided in AHRI 1360–202X Draft represents industry consensus regarding the most appropriate and representative method for testing these CRACs. DOE is proposing to adopt the provisions in AHRI 1360–202X Draft regarding testing wall-mounted and roof-mounted CRACs.

In the July 2017 ASHRAE TP RFI, DOE also requested comment on whether there are other configurations of commercial package air conditioners that are designed, marketed, or used in computer room cooling applications and that meet DOE's current definition for a CRAC, beyond floor-mounted units, ceiling-mounted units, portable units, indoor single-package wall-mounted units, roof-mounted units, and certain SPVUs. 82 FR 34427, 34431 (July 25, 2017).

In response, AHRI commented that DOE's list of configurations of commercial package air conditioners presented in the July 2017 ASHRAE TP RFI covers all variations of systems used for data center cooling other than variable refrigerant flow multi-split air conditioners and heat pumps (''VRF multi-split systems''), evaporative coolers, and site built-up systems (*i.e.,* engineered-to-order systems). (AHRI, No. 11 at p. 3)

DOE has not identified any VRF multi-split systems on the market that are specifically marketed for computer room cooling applications, and provisions for testing such systems are not included in AHRI 1360–202X Draft or ANSI/ASHRAE 127–2020. Evaporative coolers do not include refrigeration systems; therefore, they are not air conditioners and are not covered products or equipment under 42 U.S.C. 6291 or 42 U.S.C. 6311, respectively. The Federal test procedures (and energy conservation standards) do not distinguish between ''engineered-to-order'' equipment and mass-market equipment. To the extent that equipment is a CRAC, it is subject to the Federal test procedures and applicable energy conservation standards. In its comments, AHRI did not provide any indication that there are site-built/engineered-to-order CRACs that warrant unique test provisions. In accordance with the CRAC configurations covered in AHRI 1360–202X Draft, DOE surmises that the provisions provided in AHRI 1360–202X Draft represents industry consensus regarding the configurations of CRACs for which specific test provisions are warranted. DOE is not proposing test provisions for any configurations of CRACs not included in AHRI 1360–202X Draft.

4. ANSI/ASHRAE 37 Test Requirements

The current DOE test procedure for CRACs references ANSI/ASHRAE 127–2007, which in turn references ANSI/ASHRAE Standard 37–2005, ''Methods of Testing for Rating Unitary Air-Conditioning and Heat Pump Equipment'' (ANSI/ASHRAE 37–2005). In the July 2017 ASHRAE TP RFI, DOE noted that ANSI/ASHRAE 127–2012 and AHRI 1360–2016 reference a more recent version (*i.e.,* ANSI/ASHRAE 37–2009), but none of these industry test standards for CRACs indicate which specific provisions of the applicable version of ANSI/ASHRAE 37 are intended to apply. 82 FR 34427, 34433 (July 25, 2017). DOE requested comment on whether the test method of ANSI/ASHRAE 37–2009 is appropriate for measuring capacity, sensible capacity, and electric energy use for all configurations of CRACs (including configurations for which DOE does not currently prescribe standards). *Id.*

In response, AHRI stated that a combination of ANSI/ASHRAE 37–2009, ANSI/ASHRAE 127–2012, and the draft version of AHRI 1360 at the time of AHRI's comment should cover most test methods for CRACs. (AHRI, No. 11 at p. 5).

AHRI 1360–202X Draft also references ANSI/ASHRAE 37–2009 but provides additional clarity on the applicability of provisions in ANSI/ASHRAE 37–2009. Specifically, Section 5.1 of AHRI 1360–202X Draft specifies that all testing shall be conducted in accordance with ANSI/ASHRAE 127–2020 and ANSI/ASHRAE 37–2009, and that in the event of conflicting instructions between test standards, the instructions in AHRI 1360–202X Draft take precedence. In light of the provisions in AHRI 1360–202X Draft regarding the applicability of ANSI/ASHRAE 37–2009, DOE surmises that the approach provided in AHRI 1360–202X Draft represents industry consensus regarding the most appropriate and representative method for testing CRACs. DOE is proposing to adopt the provisions in AHRI 1360–202X Draft regarding the applicability of ANSI/ASHRAE 37–2009 for testing CRACs.

In the July 2017 ASHRAE TP RFI, DOE raised several more specific issues related to the applicability of ANSI/ASHRAE 37–2009. These issues are addressed in AHRI 1360–202X Draft, and DOE is proposing to adopt these provisions in AHRI 1360–202X Draft. These issues are discussed in the following subsections.

a. Test Tolerances

Table 2b of ANSI/ASHRAE 37–2009 includes test operating tolerances (*i.e.,* the maximum permissible range of a measurement during the specified test interval) and condition tolerances (*i.e.,* the maximum permissible difference between the averaged value of the measured test parameter and the specified test condition) for several parameters, including air and fluid temperatures. Section 5.1 of ANSI/ASHRAE 127–2007 and Section 5.2.1 of ANSI/ASHRAE 127–2012 include an operating tolerance for the room temperature; however, no published versions of ANSI/ASHRAE 127 or AHRI 1360 prior to AHRI 1360–2017 specifically include tolerances for any other test parameters or clarify whether such tolerances are included as part of the general reference to ASHRAE Standard 37.

In the July 2017 ASHRAE TP RFI, DOE requested comment on whether any operating or condition tolerances included in Table 2b of ANSI/ASHRAE 37–2009 are inappropriate for CRACs. If any are inappropriate, DOE requested an explanation as to why and suggestions on how the tolerances should be changed. 82 FR 34427, 34433 (July 25, 2017).

In response, AHRI commented that the tolerances listed in Table 2b of ANSI/ASHRAE 37–2009 are appropriate for testing CRACs. (AHRI, No. 11 at p. 5)

Subsequently, the AHRI 1360 committee has developed an updated draft version, AHRI 1360–202X Draft, which specifies operating and condition test tolerances in Table 7 of the draft industry test standard. These tolerances generally align with those in Table 2b of ANSI/ASHRAE 37–2009 but also include tolerances for electrical voltage, electrical frequency, and indoor and outdoor dew point temperatures. Furthermore, section E5.3.2 of Appendix E of AHRI 1360–202X Draft specifies condition tolerances for indoor

airflow and ESP. DOE is proposing to adopt the test tolerances specified in AHRI 1360–202X Draft.

b. Enclosure for CRACs With Compressors in Indoor Units

DOE's research indicates that most air-cooled CRACs are split systems with the compressor(s) housed in the indoor unit. Additionally, water-cooled and glycol-cooled CRACs are typically single-package systems, and all components in such systems are typically intended for indoor installation. Where the compressor is installed in relation to the conditioned space and other system components impacts the capacity of the system and the provisions necessary for accurately measuring system capacity, because waste heat from the compressor is transferred to the surrounding air. Section 6.1.5 of ASHRAE 37–2009 states that an enclosure as shown in Figure 3 of the standard must be used when the compressor is housed in the indoor section (*i.e.,* indoor unit) and separately ventilated (*i.e.,* air that absorbs compressor heat would not combine with supply air, which is used to measure capacity). Figure 3 shows an insulated enclosure surrounding the indoor unit that ensures that the separately ventilated compressor air recombines with supply air to be included in capacity measurements. Hence, the heat rejected from the compressor shell is accounted for in the indoor air enthalpy method measurement. This test arrangement also reflects field performance of the air conditioner to the extent that any compressor heat rejected to the indoors will heat the space, thereby reducing cooling capacity and increasing heating capacity. For systems where the compressor is in the indoor section but not separately ventilated, the air that absorbs compressor heat combines with supply air and is accounted for in the indoor air enthalpy method capacity measurements without the need for the enclosure in Figure 3. In the 2017 ASHRAE TP RFI, DOE requested comment on whether it is appropriate to incorporate the impact of compressor heat in sensible capacity measurements for CRACs with compressors housed in their indoor units. 82 FR 34427, 34433 (July 25, 2017).

In response, AHRI stated that the heat released from the compressor shell is not significant. AHRI further commented that both the hot and cold sections of the compressor are typically exposed to the unit airstream, and, therefore, that compressor heat (if any) is already included in the sensible capacity measurement of CRACs. Similarly, in units where the compressor is in a separate compartment, AHRI stated that the negative air pressure of the adjacent evaporator usually pulls the compressor heat, if any, into the airstream. (AHRI, No. 11 at p. 6).

Section 5.4 of AHRI 1360–202X Draft specifies requirements for when an enclosure as shown in Figure 3 of ANSI/ASHRAE 37–2009 must be used for testing CRACs. Specifically, Section 5.4.1 notes than an enclosure is required for systems for which the compressor(s) is housed in a part of the unit that the manufacturer's installation instructions indicate is intended for indoor installation and the compressor(s) is separately ventilated from the evaporator or condenser airstream. Additionally, for systems for which the compressor(s) is housed in a part of the unit that the manufacturer's installation instructions indicate is intended for indoor installation, but the compressor(s) is not separately ventilated—Section 5.4.2 states that an enclosure must be used if the required heat balance between the primary and secondary capacity measurements cannot be achieved. In light of the provisions in AHRI 1360–202X Draft regarding enclosures for CRACs with compressors in the indoor unit, DOE surmises that AHRI's original position on these provisions, as set forth in the comments in response to the July 2017 ASHRAE TP RFI, changed during the course of developing that industry consensus standard. DOE is proposing to adopt the provisions regarding enclosures for CRACs with compressors in the indoor unit specified in Section 5.4 of AHRI 1360–202X Draft.

c. Secondary Methods for Capacity Measurement

Section 7.2.1 of ANSI/ASHRAE 37–2005 (which is referenced by ANSI/ASHRAE 127–2007, which is incorporated by reference in DOE's current test procedure) and Section 7.2.1 of ANSI/ASHRAE 37–2009 (which is referenced by all CRAC industry test standards published after 2009) both require that when testing equipment with a total cooling capacity less than 135,000 Btu/h, simultaneous capacity tests must be conducted using the indoor air enthalpy method as the primary method and one other applicable method as the secondary method.[17] Specifically, these other applicable test methods include the outdoor air enthalpy method, the compressor calibration method, the refrigerant enthalpy method, and the outdoor liquid coil method. Table 1 of ANSI/ASHRAE 37–2005 and Table 1 of ANSI/ASHRAE 37–2009 specify which of these test methods are applicable for each equipment configuration and method of heat rejection in cooling mode. Additionally, Section 10.1.2 of these standards requires that the total cooling capacity values calculated from the two simultaneously conducted methods agree within 6.0 percent.

The secondary test method is mainly used to validate the accuracy of the capacity measurements. Specifically, the secondary test method ensures that all energy flowing into and out from the system are accounted for. If the measured total cooling capacity is verified to be accurate by using a secondary test method, the measured sensible cooling capacity using the indoor air enthalpy method likewise would be accurate, thereby ensuring results that are appropriately representative of equipment operation during an average use cycle.

In the 2017 ASHRAE TP RFI, DOE sought comment on whether a secondary test is appropriate for testing CRACs, for what range of cooling capacity such a requirement should apply for CRACs, how the requirement should be applied, what level of agreement should be required, and whether there would be a significant additional test burden resulting from a secondary test. 82 FR 34427, 34433 (July 25, 2017).

In response, AHRI stated that it is not aware of a secondary test that confirms sensible cooling capacity specifically. AHRI recommended that DOE not adopt a secondary test requirement for CRACs until such time as an appropriate test method is developed and proven to be accurate. (AHRI, No. 11 at p. 5)

AHRI 1360–202X Draft includes requirements for conducting secondary methods of total capacity measurement for CRACs. More specifically, Section E7.2 of Appendix E of AHRI 1360–202X Draft sets forth equipment configurations for which secondary measurements are not required, but for all other configurations, it requires use of one of the applicable ''Group B'' methods specified in Table 1 of ANSI/ASHRAE 37–2009 as a secondary method.[18] Section E7.4 of Appendix E

[17] ANSI/ASHRAE 37–2009 does not require secondary capacity measurements for equipment with cooling capacity greater than or equal to 135,000 Btu/h.

[18] Specifically, Section E7.2 of Appendix E of AHRI 1360–202X Draft includes the following requirements: For the following equipment, no secondary measurements are required: (1) Single-package evaporatively-cooled equipment with rated cooling capacity greater than or equal to 135,000

Continued

of AHRI 1360–202X Draft specifies a requirement on agreement between total capacity measurements (for applicable equipment)—the secondary capacity measurement must be within 6 percent of the primary capacity measurement. In light of the provisions in AHRI 1360–202X Draft regarding secondary methods for capacity measurement, DOE surmises AHRI's original position on these provisions, as set forth in the comments in response to the July 2017 ASHRAE TP RFI, changed during the course of developing that industry consensus standard. DOE is proposing to adopt the provisions regarding secondary methods specified in Section E7 of AHRI 1360–202X Draft.

5. Ducted Condensers

CRACs with condensers or condensing units intended for indoor installation may require ducting of outdoor air. As part of the July 2017 ASHRAE TP RFI, DOE requested comment on how to set up the condenser airflow when testing CRACs manufactured with condenser air inlet and outlet connections and high-static condenser fans (which is indicative of units that can be installed indoors with the condenser inlet air ducted from the outdoors to the unit, and vice versa for the condenser outlet air). Additionally, DOE requested comment on whether some CRACs can be installed with or without condenser ducting, and if so, how often these units are typically installed with condenser ducting. DOE also sought comment on whether certain CRAC configurations are more likely to be installed with condenser ducting. 82 FR 34427, 34434 (July 25, 2017).

In response, AHRI stated that the condenser airflow is established and measured in accordance with ANSI/ASHRAE 37–2009 and ANSI/ASHRAE 127–2012, and that a two-step process is required when testing in psychrometric rooms without an outdoor air measurement chamber. (AHRI, No. 11 at p. 7) AHRI also commented that manufacturers do not know what percentage of CRACs with indoor condensers are ducted in the field, but that all units with indoor condensers are capable of being ducted and are rated with an ESP consistent with the requirements in Section 6.2.4.5 of AHRI 1360–2016.[19] AHRI further stated that 99 percent of air-cooled floor-mounted CRACs utilize outdoor free air discharge condensers and that only 1 percent of units are installed with indoor ducted condensers. However, AHRI stated that indoor ducted condensers are more prevalent for air-cooled ceiling-mounted CRACs (20 percent). Additionally, AHRI argued that due to space constraints, as well as larger condenser fan motors, ceiling-mounted CRACs with ducted condensers should have lower minimum efficiency levels. AHRI stated that it will develop a proposal regarding efficiency levels to be included in ASHRAE Standard 90.1 for ceiling-mounted CRACs with ducted condensers in the near future. *Id.*

AHRI 1360–202X Draft includes provisions for testing CRACs with ducted condensers. Specifically, Table 6 of AHRI 1360–202X Draft provides the following outdoor air ESP requirements for units with ducted condensers: 0.5 in H_2O [20] for ceiling-mounted units, and 0.0 in H_2O for all other configurations. Further, Section E6 of Appendix E of AHRI 1360–202X Draft specifies test provisions for setting outdoor airflow and outdoor air ESP for units with ducted condensers. In light of the provisions in AHRI 1360–202X Draft regarding testing CRACs with ducted condensers, DOE surmises that the approach provided in AHRI 1360–202X Draft represents industry consensus regarding the most appropriate and representative method for testing CRACs with ducted condensers. DOE is proposing to adopt the provisions in AHRI 1360–202X Draft regarding testing CRACs with ducted condensers.

Regarding AHRI's comment about stringency of minimum efficiency levels for ceiling-mounted CRACs with ducted condensers, DOE notes that minimum efficiency levels for ceiling-mounted CRACs (including separate levels for units with and without ducted condensers) are included in ASHRAE Standard 90.1–2019. DOE is evaluating the ASHRAE Standard 90.1–2019 minimum efficiency levels for CRACs in a separate energy conservation standards rulemaking (*see* Docket No. EERE–2020–BT–STD–0008).

6. Minimum External Static Pressure Requirements

In the July 2017 ASHRAE TP RFI, DOE noted that ANSI/ASHRAE 127–2007 (which is referenced by the current DOE test procedure), ANSI/ASHRAE 127–2012, and AHRI 1360–2016 all contain different minimum ESP specifications. 82 FR 34427, 34433 (July 25, 2017). DOE noted that the 2007 and 2012 versions of ANSI/ASHRAE 127 contain the same minimum ESP levels but use different definitions to determine which minimum ESP level applies for a given unit. Specifically, ANSI/ASHRAE 127–2012 defines ''ducted systems'' as ''air conditioners intended to be connected to supply and/or return ductwork'' instead of ''to supply and return ductwork,'' as specified in ANSI/ASHRAE 127–2007. Additionally, DOE observed that the ESP requirements specified in AHRI 1360–2016 for up-flow ducted and down-flow configurations are significantly lower than those specified in ANSI/ASHRAE 127–2012. DOE further stated that it was considering adopting the test procedures and the ESP requirements specified in AHRI 1360–2016, but sought input on whether the ESP requirements specified in AHRI 1360–2016 are representative of field operation for floor-mounted CRACs. 82 FR 34433–34434 (July 25, 2017).

In response, AHRI commented that while there are some unusual circumstances where excessive ducting is required, the ESP requirements specified in AHRI 1360–2016 are representative of most applications. (AHRI, No. 11 at p. 6)

AHRI 1360–202X Draft specifies indoor air ESP requirements in Table 5 for all configurations of CRACs. The ESP requirements specified for floor-mounted CRACs in Table 5 align with those specified in AHRI 1360–2016, except that the capacity boundaries for ESP requirements for up-flow ducted units increased from 65,000 Btu/h and 240,000 Btu/h to 80,000 Btu/h and 295,000 Btu/h, respectively. This increase in capacity boundaries reflects the increase in NSCC associated with the increased return air temperature for up-flow ducted units in the NSenCOP metric, as compared to the SCOP metric (*see* section III.E.1.a of this NOPR for further discussion of the indoor entering air temperature conditions for NSenCOP). ESP requirements for ceiling-mounted CRACs are discussed in section III.F.2 of this NOPR, and ESP requirements for wall-mounted and roof-mounted CRACs are discussed in section III.F.3 of this NOPR. DOE surmises that the approach provided in AHRI 1360–202X Draft represents industry consensus regarding the most appropriate and representative ESP requirements for testing CRACs. DOE is not proposing any deviations from the ESP requirements specified in Table 5 of AHRI 1360–202X Draft.

Btu/h and (2) air-cooled single-package equipment with outdoor airflow rates (either manufacturer-specified or determined via testing) above 9,000 scfm. For all other equipment, use one of the applicable ''Group B'' methods specified in Table 1 of ANSI/ASHRAE 37–2009 as a secondary method for capacity measurement.

[19] Section 6.2.4.5 of AHRI 1360–2016 specifies that for products intended to be installed with the outdoor airflow ducted, the unit shall be installed with outdoor coil ductwork installed per manufacturer installation instructions and shall operate at 0.5 in H_2O ESP.

[20] The symbol ''in H_2O'' refers to inches of water column.

7. Refrigerant Charging Instructions

The amount of refrigerant charge in an air conditioner can have a significant impact on the system performance. DOE's current test procedure for CRACs requires that units be set up for test in accordance with the manufacturer installation and operation manuals. 10 CFR 431.96(e). In addition, the current DOE test procedure states that if the manufacturer specifies a range of superheat, sub-cooling, and/or refrigerant pressures in the installation and operation manual, any value within that range may be used to determine refrigerant charge, unless the manufacturer clearly specifies a rating value in its installation or operation manual, in which case the specified value shall be used. 10 CFR 431.96(e)(1). The current DOE test procedure does not provide charging instructions if the manufacturer does not provide instructions in the manual that is shipped with the unit or if the provided instructions are unclear or incomplete.

As part of the July 2017 ASHRAE TP RFI, DOE noted that neither the ASHRAE nor the AHRI test standards for CRACs (published at the time of the July 2017 ASHRAE TP RFI) include specific instructions for refrigerant charging. 82 FR 34427, 34434 (July 25, 2017). In a June 8, 2016 final rule for the test procedure for central air conditioners and heat pumps (CACs/HPs), DOE further stated that the Federal test procedure for CACs/HPs provides a comprehensive approach for refrigerant charging intended to improve test reproducibility.[21] 81 FR 36992, 37030–37031. Specifically, DOE noted in the July 2017 ASHRAE TP RFI that the approach for CACs/HPs indicates which set of installation instructions to use for charging, explains what to do if there are no instructions, indicates that target values of parameters are the centers of the range allowed by installation instructions, and specifies tolerances for the measured values. DOE requested comment on which refrigerant charging requirements should be considered to establish reproducible test results for CRACs, and whether the approach for CACs/HPs would be appropriate for CRACs. DOE also requested comment on the operating conditions at which CRAC units are typically charged in the field and/or what conditions should be used to set refrigerant charge for testing purposes. 82 FR 34427, 34434–34435 (July 25, 2017).

In response, AHRI commented that refrigerant charging should be based on the manufacturer's instructions, and that because CRACs are operated year-round, manufacturers determine the optimum charge for hot and cold weather operation. (AHRI, No. 11 at p. 8).

Section 5.9 of AHRI 1360–202X Draft includes a comprehensive set of provisions regarding refrigerant charging for CRACs that is generally consistent with the approach for CACs/HPs currently in DOE's regulations. Specifically, Section 5.9 of AHRI 1360–202X Draft requires that units be charged at conditions specified by the manufacturer in accordance with the manufacturer installation instructions or labels applied to the unit, which is consistent with AHRI's comment. If there are no manufacturer-specified charging conditions, Section 5.9 of AHRI 1360–202X Draft specifies charging at the standard rating conditions (as defined in Tables 3 and 4 of that test standard). Section 5.9 of AHRI 1360–202X Draft also provides additional charging instructions to be used if the manufacturer does not provide instructions or if the provided instructions are unclear or incomplete (*e.g.,* specifying default charging targets to use if none are provided by the manufacturer and specifying an instruction priority to be used in the event of conflicting information between multiple manufacturer-provided charging instructions). In light of the provisions in AHRI 1360–202X Draft, DOE surmises that the approach provided in AHRI 1360–202X Draft represents industry consensus regarding the most appropriate and representative approach for refrigerant charging for testing CRACs. DOE is not proposing any deviations from the refrigerant charging provisions specified in Section 5.9 of AHRI 1360–202X Draft.

G. Configuration of Unit Under Test

CRACs are distributed in commerce in a variety of configurations consisting of different combinations of components. The following sections address the required configuration of units under test.

1. Specific Components

An Appliance Standards and Rulemaking Federal Advisory Committee (ASRAC) working group for certain commercial heating, ventilating, and air conditioning (HVAC) equipment (Commercial HVAC Working Group),[22] which included CRACs, submitted a term sheet (Commercial HVAC Term Sheet) providing the Commercial HVAC Working Group's recommendations. (Docket No. EERE–2013–BT–NOC–0023, No. 52) [23] The Commercial HVAC Working Group recommended that DOE issue guidance under current regulations on how to test certain equipment features when included in a basic model, until the testing of such features can be addressed through a test procedure rulemaking. The Commercial HVAC Term Sheet listed the subject features under the heading ''Equipment Features Requiring Test Procedure Action.'' (*Id.* at pp. 3–9) The Commercial HVAC Working Group also recommended that DOE issue an enforcement policy stating that DOE would exclude certain equipment with specified features from Departmental testing, but only when the manufacturer offers for sale at all times a model without that feature but that is identical in terms of all other features; otherwise, the model with that feature would be eligible for Departmental testing. These features were listed under the heading ''Equipment Features Subject to Enforcement Policy.'' (*Id.* at pp. 9–15)

On January 30, 2015, DOE issued a Commercial HVAC Enforcement Policy addressing the treatment of specific features during Departmental testing of commercial HVAC equipment. (*See www.energy.gov/gc/downloads/commercial-equipment-testing-enforcement-policies*) The Commercial HVAC Enforcement Policy stated that—for the purposes of assessment testing pursuant to 10 CFR 429.104, verification testing pursuant to 10 CFR 429.70(c)(5), and enforcement testing pursuant to 10 CFR 429.110—DOE would not test a unit with one of the optional features listed for a specified equipment type if a manufacturer distributes in commerce an otherwise identical unit that does not include one of the optional features. (*Id* at p. 1) The objective of the Commercial HVAC Enforcement Policy is to ensure that each basic model has a commercially-available version eligible for DOE testing, meaning that each basic model includes either a model without the optional feature(s) or a model with the optional features that is eligible for testing. *Id.* The features in the Commercial HVAC Enforcement Policy for CRACs align with the Commercial HVAC Term Sheet's list designated

[21] The currently applicable test procedure for CACs/HPs is located at 10 CFR part 430, subpart B, appendix M.

[22] In 2013, members of ASRAC formed the Commercial HVAC Working Group to engage in a negotiated rulemaking effort regarding the certification of certain commercial HVAC equipment, including CRACs. The Commercial HVAC Working Group's recommendations are available at *www.regulations.gov* under Docket No. EERE–2013–BT–NOC–0023–0052.

[23] Available at *www.regulations.gov/document/EERE-2013-BT-NOC-0023-0052.*

''Equipment Features Subject to Enforcement Policy.''

AHRI 1360–202X Draft includes Appendix D, ''Unit Configuration for Standard Efficiency Determination—Normative.'' Section D2 of that appendix includes a list of features that are optional for testing. Section D2 of AHRI 1360–202X Draft further specifies the following general provisions regarding testing of units with optional features:

- If an otherwise identical model (within the same basic model) without the feature is distributed in commerce, test the otherwise identical model.
- If an otherwise identical model (within the same basic model) without the feature is not distributed in commerce, conduct tests with the feature present but configured and de-activated so as to minimize (partially or totally) the impact on the results of the test (as determined per the provisions in section D2). Alternatively, the manufacturer may indicate in the supplemental testing instructions that the test shall be conducted using a specially built otherwise identical unit that is not distributed in commerce and does not have the feature.

The optional features provisions in AHRI 1360–202X Draft are generally consistent with DOE's Commercial HVAC Enforcement Policy, but the list of optional features in Section D2 of AHRI 1360–202X Draft does not align with the list of features included for CRACs in the Commercial HVAC Enforcement Policy. For CRACs, the Commercial HVAC Enforcement Policy specifies two optional features (high-static condenser fan/motor assembly and dehumidification components) which are not included in the optional features section in Section D2 of AHRI 1360–202X Draft. DOE understands AHRI 1360–202X Draft to represent the industry consensus position on testing CRACs. As such, DOE understands the industry consensus to be that these two features should not be treated as optional features for CRACs.

Additionally, unlike Section D2 of AHRI 1360–202X Draft, DOE's Commercial HVAC Enforcement Policy does not allow a manufacturer to test a specially-built otherwise identical model for testing models without a feature that are not distributed in commerce. Because testing such specially-built models would not provide ratings representative of equipment distributed in commerce, DOE has tentatively concluded that this option is not appropriate. Therefore, consistent with the Commercial HVAC Enforcement Policy, DOE is not proposing to include this option for testing specially-built units in its representation and enforcement provisions.

DOE notes that the list of features and provisions in Section D2 of Appendix D of AHRI 1360–202X Draft conflates features that can be addressed by testing provisions with features that warrant enforcement relief (*i.e.,* features that, if present on a unit under test, could have a substantive impact on test results and that cannot be disabled or otherwise mitigated). This differentiation was central to the Commercial HVAC Term Sheet, which as noted previously, included separate lists for ''Equipment Features Requiring Test Procedure Action'' and ''Equipment Features Subject to Enforcement Policy,'' and remains central to providing clarity in DOE's regulations. Further, provisions more explicit than what is included in Section D2 of AHRI 1360–202X Draft are warranted to clarify the differences between how specific components must be treated when manufacturers are making representations as opposed to when DOE is conducting enforcement testing.

In order to provide clarity between test procedure provisions (*i.e.,* how to test a specific unit) and representation and enforcement provisions (*e.g.,* which model to test), DOE is not proposing to adopt Sections D1 and D2 of Appendix D of AHRI 1360–202X Draft but instead is proposing to adopt related provisions in 10 CFR part 431, subpart F, appendix E1, in 10 CFR 429.43, and in 10 CFR 429.134, without any substantive change to the requirements, except as discussed subsequently regarding coated coils and previously regarding specially-built units.

Specifically, in 10 CFR part 431, subpart F, appendix E1, DOE proposes test procedure provisions for specific components, including the components listed in section D2 of AHRI 1360–202X Draft for which there is a unique test procedure action (*i.e.,* test procedure provisions specific to the component that are not addressed by general provisions in AHRI 1360–202X Draft to test per manufacturers' installation instructions).[24] These provisions would specify how to test a unit with such a component. For example, for a unit with an air economizer factory-installed, place the economizer in the 100-percent return position and close and seal the outside air dampers for testing. These proposed test provisions are consistent with the provision in Section D2 of AHRI 1360–202X Draft, but include revisions for further clarity and specificity (*e.g.,* adding clarifying provisions for how to test units with modular economizers, as opposed to units shipped with economizers installed).

Consistent with the Commercial HVAC Term Sheet and the Commercial HVAC Enforcement Policy, in 10 CFR 429.43(a)(4), DOE is proposing provisions that would allow determination of represented values to be based on an individual model distributed in commerce without the component in specific cases. The components to which these provisions apply are limited to those components for which the test provisions for testing a unit with these components may result in differences in ratings compared to testing a unit without these components.[25] For these components, DOE proposes in 10 CFR 429.43(a)(4) that:

- If a basic model includes only individual models distributed in commerce with a specific component, or does not include any otherwise identical individual models without the specific component, the manufacturer must determine represented values for the basic model based on performance of an individual model with the component present (and consistent with any relevant proposed test procedure provisions in appendix E1).
- If a basic model includes both individual models distributed in commerce with a specific component and otherwise identical individual models without the specific component, the manufacturer may determine represented values for the basic model based on performance of an individual model either with the component present (and consistent with any relevant proposed test procedure provisions in appendix E1) or without the component present.

DOE's proposed provisions in 10 CFR 429.43(a)(4) include all of the optional features (excluding those that pertain only to chilled water equipment and not to CRACs) specified in Section D2 of AHRI 1360–202X Draft for which the

[24] For the following components listed in Section D2 of AHRI 1360–202X Draft, DOE has tentatively concluded that there is not a specific test procedure action to be specified for testing a unit with the component present: Powered exhaust/powered return air fans, coated coils, compressor variable frequency drive (VFD), flooded condenser head pressure controls, and condensate pump.

[25] DOE has tentatively concluded that for the following features included in Section D2 of AHRI 1360–202X Draft, testing a unit with these components in accordance with the proposed test provisions would not result in differences in ratings compared to testing a unit without these components. Therefore, DOE is not proposing to include these features in 10 CFR 429.43(a)(4): High-effectiveness indoor air filtration, harmonic distortion mitigation devices, electric reheat elements, and non-standard power transformer.

test provisions for testing a unit with these components may result in differences in ratings compared to testing a unit without these components, except coated coils. DOE is proposing to exclude coated coils from the specific components list specified in 10 CFR 429.43 because DOE has tentatively concluded that the presence of coated coils does not result in a significant impact to performance of CRACs, and, therefore, that models with coated coils should be rated based on performance of models with coated coils.

DOE notes that in some cases, individual models may include multiples of the specified components or there may be individual models within a basic model that include various versions of the specified components that result in more or less energy use. In these cases, the represented values of performance must be representative of the lowest efficiency found within the basic model.

Also consistent with the Commercial HVAC Term Sheet and the Commercial HVAC Enforcement Policy, in 10 CFR 429.134(g), DOE is proposing provisions regarding how DOE would assess compliance for basic models that include individual models distributed in commerce with specific components.

- If a basic model includes only individual models distributed in commerce with a specific component, or does not include any otherwise identical individual models without the specific component, DOE may assess compliance for the basic model based on testing an individual model with the component present (and consistent with any relevant proposed test procedure provisions in appendix E1).
- If a basic model includes both individual models distributed in commerce with a specific component and otherwise identical individual models without the specific component, DOE will assess compliance for the basic model based on testing of an otherwise identical model within the basic model that does not include the component, except if DOE is not able to obtain such a model for testing. In such a case, DOE will assess compliance for the basic model based on testing of an individual model with the specific component present (and consistent with any relevant proposed test procedure provisions in appendix E1).

Were DOE to adopt the provisions in 10 CFR part 431, subpart F, appendix E1, 10 CFR 429.43, and 10 CFR 429.134 as proposed, DOE would rescind the Commercial HVAC Enforcement Policy to the extent it is applicable to CRACs. In a separate certification rulemaking, DOE may consider certification reporting requirements such that manufacturers would be required to certify which otherwise identical models are used for making representations of basic models that include individual models with specific components.

Issue 4: DOE seeks comment on its proposals regarding specific components in 10 CFR part 431, subpart F, appendix E1, 10 CFR 429.43, and 10 CFR 429.134.

2. Non-Standard Indoor Fan Motors

The Commercial HVAC Enforcement Policy includes high-static indoor blowers/oversized motors as an optional feature for CRACs, among other equipment. The Commercial HVAC Enforcement Policy states that when selecting a unit of a basic model for DOE-initiated testing, if the basic model includes a variety of high-static indoor blowers or oversized motor options,[26] DOE will test a unit that has a standard indoor fan assembly (as described in the STI that is part of the manufacturer's certification, including information about the standard motor and associated drive that was used in determining the certified rating). This policy only applies where: (a) The manufacturer distributes in commerce a model within the basic model with the standard indoor fan assembly (*i.e.,* standard motor and drive), and (b) all models in the basic model have a motor with the same or better relative efficiency performance as the standard motor included in the test unit, as described in a separate guidance document discussed subsequently. If the manufacturer does not offer models with the standard motor identified in the STI or offers models with high-static motors that do not comply with the comparable efficiency guidance, DOE will test any indoor fan assembly offered for sale by the manufacturer.

DOE subsequently issued a draft guidance document (''Draft Commercial HVAC Guidance Document'') on June 29, 2015 to request comment on a method for comparing the efficiencies of a standard motor and a high-static indoor blower/oversized motor.[27] As presented in the Draft Commercial HVAC Guidance Document, the relative efficiency of an indoor fan motor would be determined by comparing the percent losses of the standard indoor fan motor to the percent losses of the non-standard (oversized) indoor fan motor. The percent losses would be determined by comparing each motor's wattage losses to the wattage losses of a corresponding reference motor. Additionally, the draft method contains a table that includes a number of situations with different combinations of characteristics of the standard motor and oversized motor (*e.g,* whether each motor is subject to Federal standards for motors, whether each motor can be tested to the Federal test procedure for motors, whether each motor horsepower is less than one) and specifies for each combination whether the non-standard fan enforcement policy would apply (*i.e.,* whether DOE would not test a model with an oversized motor, as long as the relative efficiency of the oversized motor is at least as good as performance of the standard motor). DOE has not issued a final guidance document and is instead addressing the issue for CRACs in this test procedure rulemaking.

Section D3 of AHRI 1360–202X Draft includes two different approaches for comparing the efficiency for standard and non-standard indoor fan motors.[28] Section D3.1 of AHRI 1360–202X Draft includes an approach for directly comparing the efficiency for standard and non-standard indoor fan motors, and this approach applies for most indoor fan assemblies. Section D3.2 includes an approach to compare performance for certain integrated fan and motor (IFM) combinations in which the motor and fan cannot be separated and/or are not rated separately.

Section D3.1 of AHRI 1360–202X Draft requires that in order for the individual model with the non-standard indoor fan motor to be certified within the same basic model as the individual model with the standard indoor fan motor, the non-standard indoor fan motor must be more efficient than the minimum value calculated using Equation D1 of AHRI 1360–202X Draft. This minimum non-standard motor efficiency calculation is dependent on the efficiency of the standard fan motor and the reference efficiencies (determined per Table D1 of AHRI 1360–202X Draft) of the standard and non-standard fan motors.

[26] The Commercial HVAC Enforcement Policy defines ''high static indoors blower or oversized motor'' as an assembly that drives the fan and can deliver higher external static pressure than the standard indoor fan assembly sold with the equipment.

[27] Available at *www1.eere.energy.gov/buildings/appliance_standards/pdfs/draft-commercial-hvac-motor-faq-2015–06–29.pdf.*

[28] Section D3 of AHRI 1360–202X Draft states that: (1) The standard indoor fan motor is the motor specified in the manufacturer's installation instructions by the manufacturer for testing and shall be distributed in commerce as part of a particular model; and that (2) a non-standard motor is an indoor fan motor that is not the standard indoor fan motor and that is distributed in commerce as part of an individual model within the same Basic Model.

Section D3.2 of AHRI 1360–202X Draft contains a method for comparing performance of IFMs. Because the motor in an IFM is not separately rated from the fan, this method compares the performance of the entire fan-motor assembly for the standard and non-standard IFMs, rather than just the fan motors. This approach enables comparison of the relative performance of standard and non-standard IFMs, for which motor efficiencies could otherwise not be compared using the method specified in Section D3.1 of AHRI 1360–202X Draft. Specifically, this method determines the ratio of the input power of the non-standard IFM to the input power of the standard IFM at the same duty point, as defined in Section D3.2 of AHRI 1360–202X Draft (*i.e.,* operating at the maximum external static pressure for the standard IFM at the rated airflow). If the input power ratio does not exceed the maximum ratio specified in Table D3 of AHRI 1360–202X Draft, the individual model with the non-standard IFM may be certified within the same basic model as the individual model with the standard IFM. Section D3.2 of AHRI 1360–202X Draft allows these calculations to be conducted using either test data or simulated performance data.

The approaches in Section D3 of AHRI 1360–202X Draft for non-standard indoor fan motors and IFMs generally align with the approaches of the Commercial HVAC Enforcement Policy and the Draft Commercial HVAC Guidance Document, while providing greater detail and accommodating a wider range of fan motor options. DOE also has tentatively determined that Section D3 of Appendix D of AHRI 1360–202X Draft would more fully provide the guidance intended by the Commercial HVAC Enforcement Policy with regard to non-standard indoor fan motors.

DOE proposes to adopt the provisions in Section D3 of AHRI 1360–202X Draft for comparing performance of standard and non-standard indoor fan motors and IFMs in the proposed appendix E1.[29] Additionally, DOE proposes to adopt the provisions in Section D3 of Appendix D of AHRI 1360–202X Draft for the determination of the represented efficiency value of CRACs at 10 CFR 429.43(a)(3)(v)(C) and for DOE assessment and enforcement testing of CRACs at 10 CFR 429.134(s)(1). Were DOE to adopt the references to section D3 of Appendix D of AHRI 1360–202X Draft, as proposed, DOE would rescind the Commercial HVAC Enforcement Policy to the extent it is applicable to CRACs.

Issue 5: DOE requests comment on its proposal to adopt the methods for comparing relative efficiency of standard and non-standard indoor fan motors and integrated fan and motor combinations specified in Section D3 of AHRI 1360–202X Draft in the proposed test procedure in 10 CFR part 431, subpart F, appendix E1, as well as in provisions for determination of represented values in 10 CFR 429.43(a) and provisions for DOE assessment and enforcement testing in 10 CFR 429.134.

H. General Comments

In response to the July 2017 ASHRAE TP RFI, DOE received several general comments not specific to any one equipment category or test procedure. This section addresses those comments.

NCI recommended that DOE follow the development of ASHRAE Standard 221P, ''Test Method to Measure and Score the Operating Performance of an Installed Constant Volume Unitary HVAC System,'' and consider where it may be appropriately applied within EPCA test procedures. (NCI, No. 4 at pp. 1–2) NCI stated that it has collected data indicating that typical split systems and packaged units serving residential and small commercial buildings typically deliver 50 percent to 60 percent of the rated capacity to the occupied zone, thereby making laboratory tests unrepresentative of field performance. *Id.*

As noted in section I.A of this NOPR, EPCA prescribes that if an industry testing procedure or rating procedure developed or recognized by industry (as referenced in ASHRAE Standard 90.1) is amended, DOE must update its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(A) and (B)) DOE notes that ASHRAE Standard 90.1 does not reference ANSI/ASHRAE Standard 221–2020, ''Test Method to Field-Measure and Score the Cooling and Heating Performance of an Installed Unitary HVAC System'' [30] as the applicable test procedure for CRACs. NCI also did not provide data on field performance or any correlations between CRAC field performance and laboratory test performance for DOE to consider. Furthermore, ASHRAE 221–2020 does not provide a method to determine the efficiency of CRACs. As discussed, DOE is proposing to adopt the substance of AHRI 1360–202X Draft, either through incorporation by reference of the final version of the update to AHRI 1360 as published, or by specifying the substance of the relevant test procedure provisions in the CFR.

The CA IOUs commented that while the July 2017 ASHRAE TP RFI expressed interest in reducing burden to manufacturers, DOE already took steps to reduce burden by allowing alternative energy efficiency or energy use determination methods (AEDMs). (CA IOUs, No. 7 at pp. 1–2) The CA IOUs expressed their view that there are no further opportunities to streamline test procedures to limit testing burden. *Id.* Additionally, the CA IOUs emphasized the importance of accurate efficiency ratings for its incentive programs and customer knowledge, pointing to the statutory provision that test procedures must produce results that are representative of the product's energy efficiency. (*Id.*)

Lennox stated that it generally supports DOE meeting the statutory requirements to design test procedures to measure energy efficiency during an average use cycle, but in doing so, the commenter requested that DOE also consider overall impacts on consumers and manufacturers. (Lennox, No. 8 at pp. 1–2). The commenter stated that in commercial applications, predicting actual energy use from a single metric is difficult and that a metric better serves as a point of comparison. (*Id.*) Lennox suggested that DOE should strike a balance between evaluating equipment in a meaningful way without introducing unwarranted regulatory burden from overly complex test procedures or calculations that provide little value to consumers. (*Id.*)

In response to the CA IOUs and Lennox, DOE notes that its approach to test procedures is largely dictated by the requirements of EPCA. As discussed, EPCA prescribes that the test procedures for commercial package air conditioning and heating equipment must be those

[29] Per DOE's existing certification regulations, if a manufacturer were to use the proposed approach to certify a basic model, the manufacturer would be required to maintain documentation of how the relative efficiencies of the standard and non-standard fan motors or the input powers of the standard and non-standard IFMs were determined, as well as the supporting calculations. *See* 10 CFR 429.71.

[30] Found online at *www.webstore.ansi.org/Standards/ASHRAE/ANSIASHRAEStandard2212020.* ASHRAE Standard 221P was the name of the proposed standard prior to publication. However, after publication, the name of that standard became ASHRAE Standard 221–2020.

generally accepted industry testing procedures or rating procedures developed or recognized by industry as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) If such relevant industry test procedure is amended, DOE must update its test procedure to be consistent with the amended industry consensus test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that the amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B)) In establishing or amending its test procedures, DOE must develop test procedures that are reasonably designed to produce test results which reflect energy efficiency, energy use, and estimated operating costs of a type of industrial equipment during a representative average use cycle and that are not unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)). DOE's considerations of these requirements in relation to individual test method issues are discussed within the relevant sections of this NOPR.

The Joint Advocates stated that there are ambiguities in industry test procedures, and these commenters recommended that DOE should address these ambiguities in order to provide a level playing field for manufacturers and to ensure that any verification or enforcement testing is consistent with manufacturers' own testing. (Joint Advocates, No. 9 at p. 2)

In response, DOE notes that the Joint Advocates did not identify any specific test provisions that were the cause of their concern. In the context of the test procedure for CRACs, DOE has carefully and thoroughly evaluated the industry test standard in the context of the statutory criteria regarding representativeness of the measured energy efficiency and test burden. To the extent there are provisions in the relevant industry test procedure that may benefit from further detail, such provisions are discussed in the previous sections of this document. DOE welcomes further stakeholder input on this topic, as necessary.

I. Represented Values

1. Multiple Refrigerants

DOE recognizes that some commercial package air conditioning and heating equipment may be sold with more than one refrigerant option (*e.g.,* R–410A or R–407C). Typically, manufacturers specify a single refrigerant in their literature for each unique model, but in its review, DOE has identified at least one CRAC manufacturer that provides two refrigerant options under the same model number. The refrigerant chosen by the customer in the field installation may impact the energy efficiency of a unit. For this reason, DOE is proposing representation requirements applicable to models approved for use with multiple refrigerants. So that the proposals in this NOPR would only require manufacturers to update representations once, DOE proposes to align the compliance date for these representation requirements with the proposed metric change (*i.e.,* these proposals would only be required when certifying to amended standards in terms of NSenCOP).

Use of a refrigerant (such as R–407C as compared to R–410A) that requires different hardware (*i.e.,* compressors, heat exchangers, or air moving systems that are not the same or comparably performing) would represent a different basic model, and according to current DOE regulations, separate representations of energy efficiency are required for each basic model. 10 CFR 429.43(a) In contrast, some refrigerants (such as R–422D, R–427A) do not require different hardware, and a manufacturer may consider them to be the same basic model, per DOE's current definition for ''basic model'' at 10 CFR 431.92. In the latter case of a CRAC with multiple refrigerant options that do not require different hardware, DOE proposes that a manufacturer must determine the represented values in the proposed new section 10 CFR 429.43(a)(3)(v)(A) (*e.g.,* NSenCOP and net sensible cooling capacity) for that basic model based on the refrigerant(s)—among all refrigerants listed on the unit's nameplate—that result in the lowest cooling efficiency. These represented values would apply to the basic model for all refrigerants specified by the manufacturer as appropriate for use, regardless of which refrigerant is actually used in the field.

Issue 6: DOE requests comment on its proposal regarding representations for CRAC basic models approved for use with multiple refrigerants.

2. Net Sensible Cooling Capacity

For CRACs, NSCC determines equipment class, which in turn determines the applicable energy conservation standard. 10 CFR 431.97. While NSCC is a required represented value for CRACs, DOE does not currently specify any provisions for CRACs regarding how close the represented value of NSCC must be to the tested or AEDM-simulated NSCC, or whether DOE will use measured or certified NSCC to determine equipment class for enforcement testing. In contrast, at paragraphs (a)(1)(iv) and (a)(2)(ii) of 10 CFR 429.43 and paragraph (g) of 10 CFR 429.134, DOE specifies such provisions regarding the cooling capacity for air-cooled CUACs (ACUACs). Because energy conservation standards for CRACs are dependent on NSCC, inconsistent approaches to the application of NSCC between basic models could result in inconsistent determinations of equipment class and, in turn, inconsistent applications of the energy conservation standards.

Consequently, DOE is proposing to add the following provisions regarding NSCC for CRACs: (1) A requirement that the represented NSCC be between 95 percent and 100 percent of the tested or AEDM-simulated NSCC; and (2) an enforcement provision stating that DOE would use the mean of measured NSCC values from testing, rather than the certified NSCC, to determine the applicable standards.

First, DOE proposes to require in 10 CFR 429.43(a)(3)(v)(B) that the represented value of NSCC must be between 95 percent and 100 percent of the mean of the NSCC values measured for the units in the sample (if determined through testing), or between 95 percent and 100 percent of the NSCC output simulated by an AEDM. This tolerance would help to ensure that equipment is capable of performing at the cooling capacity for which it is represented to commercial consumers, while also enabling manufacturers to conservatively rate the cooling capacity to allow for minor variations in the capacity measurements from different units tested at different laboratories.

Second, DOE is proposing in its product-specific enforcement provisions at 10 CFR 429.134(s)(1) that the NSCC of each tested unit of the basic model will be measured pursuant to the test requirements of 10 CFR part 431, subpart F, appendix E1 and that the mean of the measurement(s) will be used to determine the applicable standard for compliance purposes.

As discussed, determination of the applicable energy conservation standard for CRACs is dependent on the rated NSCC. Specifically, the standards for CRACs generally decrease in stringency with increasing NSCC (*i.e.,* equipment classes with higher NSCC ranges have lower standards than equipment classes with lower NSCC ranges). Consequently, over-rating a system could result in decreased stringency by incorrectly applying a more lenient standard prescribed for a higher NSCC equipment class. DOE has tentatively concluded that these proposals would result in

more accurate ratings of NSCC, thereby ensuring application of the appropriate energy conservation standards, while providing manufacturers the flexibility to conservatively rate NSCC so as to provide reasonable certainty that the subject equipment is capable of delivering the NSCC represented to commercial consumers.

Issue 7: DOE requests comment on its proposals related to represented values and verification testing of NSCC for CRACs.

3. Validation Class for Glycol-Cooled CRACs

DOE's existing testing regulations allow the use of an AEDM, in lieu of actual testing, to simulate the efficiency of CRACs. 10 CFR 429.43(a). In the AEDM requirements for CRACs in 10 CFR 429.70, the table itemizing validation classes for commercial HVAC equipment inadvertently omits glycol-cooled CRACs. For this reason and because DOE understands glycol-cooled CRACs to be similar in design to water-cooled CRACs, DOE is proposing to include glycol-cooled CRACs in the existing validation class for water-cooled CRACs at 10 CFR 429.70(c)(2)(iv). Specifically, DOE proposes at 10 CFR 429.70(c)(2)(iv) that the minimum number of distinct water-cooled and/or glycol-cooled models that must be tested per AEDM would be two basic models, which aligns with the ''two basic model'' requirement that currently applies to the water-cooled CRACs validation class.

J. Test Procedure Costs and Impact

In this NOPR, DOE proposes to amend the existing test procedure for CRACs, by adopting the substance of the latest draft version of the applicable industry test method, AHRI 1360–202X Draft, including the energy efficiency metric, NSenCOP. To the extent that AHRI 1360 is finalized consistent with the draft, DOE proposes to incorporate the industry test standard by reference. If there are substantive changes between the draft and published versions of AHRI 1360, DOE may adopt the substance of AHRI 1360–202X Draft or provide additional opportunity for comment. DOE also proposes to amend its representation and enforcement provisions for CRACs.

DOE has tentatively determined that the proposed amendments in this NOPR would improve the representativeness, accuracy, and reproducibility of the test results and would not be unduly burdensome for manufacturers to conduct or result in increased testing cost as compared to the current test procedure. Because the current DOE test procedure for CRACs would be relocated to appendix E without change, the proposed test procedure in appendix E for measuring SCOP would result in no change in testing practices.

Should DOE adopt standards in a future energy conservation standards rulemaking in terms of the new metric (NSenCOP), the proposed test procedure in appendix E1 for measuring NSenCOP (which DOE proposes to be substantively the same as AHRI 1360–202X Draft) would be required. DOE has tentatively concluded that this proposed test procedure would not increase third-party lab testing costs per unit relative to the current DOE test procedure, which DOE estimates to be $10,200 for CRACs [31] for physical testing. However, DOE has tentatively concluded that the potential adoption of standards denominated in terms of NSenCOP (and corresponding requirement to use the proposed test procedure in appendix E1) would alter the measured energy efficiency for CRACs. Consequently, manufacturers may not be able to rely on data generated under the current test procedure and would, therefore, be required to re-rate CRAC models. Once again, in accordance with 10 CFR 429.70, CRAC manufacturers may elect to use AEDMs to rate models, which significantly reduces costs to industry. DOE estimates the per-manufacturer cost to develop and validate an AEDM for CRACs to be $46,000. DOE estimates a cost of approximately $50 per basic model [32] for determining energy efficiency using the validated AEDM.

Given that most CRAC manufacturers are AHRI members and that DOE is proposing to adopt the procedure in the prevailing industry test procedure that was established for use in AHRI's certification program, which has already been updated to include NSenCOP, DOE expects that most manufacturers would already be testing using the published version of the AHRI 1360–202X Draft in the timeframe of any potential future energy conservation standard. Based on this, DOE has tentatively determined that the proposed test procedure amendments would not be expected to increase the testing burden on CRAC manufacturers that are AHRI members. For the minority of CRAC manufacturers that are not members of AHRI, the proposed test procedure amendments may have costs associated with model re-rating, to the extent that the manufacturers would not already be testing to the updated industry test procedure.

Issue 8: DOE requests comment on its understanding of the impact of the test procedure proposals in this NOPR, specifically DOE's initial conclusion that the proposed DOE test procedure amendments, if finalized, would not increase testing burden on most CRAC manufacturers (*i.e.,* CRAC manufacturers who are AHRI members), compared to current industry practice as indicated by AHRI 1360–202X Draft, and that those proposed amendments would not have a significant impact on the remaining CRAC manufacturers (*i.e.,* CRAC manufacturers who are not AHRI members).

K. Reserved Appendices for Test Procedures for Commercial Air Conditioning and Heating Equipment

In this document, DOE proposes to establish new test procedures for CRACs in the proposed appendix E and new appendix E1 to subpart F of part 431. This proposed organization of the test procedures would be consistent with the organization of the test procedures for other covered equipment and covered products. DOE has tentatively concluded that providing the test procedures for specific equipment in designated appendices would improve the readability of the test procedures. Accordingly, to provide for future consideration of a similar organization for other commercial package air conditioning and heating equipment test procedures, DOE is proposing to reserve appendices B through D. The reserved appendices are intended to facilitate any potential future reorganization of the regulations and are not an indication of substantive changes to test procedures for other commercial package air conditioning and heating equipment.

L. Compliance Date

EPCA prescribes that, if DOE amends a test procedure, all representations of energy efficiency and energy use, including those made in the context of certification and on marketing materials

[31] Manufacturers are not required to perform laboratory testing on all basic models. In accordance with 10 CFR 429.70, CRAC manufacturers may elect to use AEDMs. An AEDM is a computer modeling or mathematical tool that predicts the performance of non-tested basic models. These computer modeling and mathematical tools, when properly developed, can provide a means to predict the energy usage or efficiency characteristics of a basic model of a given covered product or equipment and reduce the burden and cost associated with testing.

[32] DOE estimated initial costs to validate an AEDM assuming 80 hours of general time to develop an AEDM based on existing simulation tools and 16 hours to validate two basic models within that AEDM at the cost of an engineering technician wage of $50 per hour plus the cost of third-party physical testing of two units per validation class (as required in 10 CFR 429.70(c)(2)(iv)). DOE estimated the additional per basic model cost to determine efficiency using an AEDM, assuming 1 hour per basic model at the cost of an engineering technician wage of $50 per hour.

and product labels, must be made in accordance with that amended test procedure, beginning 360 days after publication of such a test procedure final rule in the **Federal Register**. (42 U.S.C. 6314(d)(1)) CRACs would not be required to be tested according to the test procedure in the proposed appendix E1 until such time as compliance is required with an amended energy conservation standard that relies on the NSenCOP metric, should DOE adopt such a standard.

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

The Office of Management and Budget (OMB) has determined that this test procedure rulemaking does not constitute a ''significant regulatory action'' under section 3(f) of Executive Order 12866, ''Regulatory Planning and Review,'' 58 FR 51735 (Oct. 4, 1993). Accordingly, this action was not subject to review under the Executive order by the Office of Information and Regulatory Affairs (OIRA) in OMB.

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: *energy.gov/gc/office-general-counsel.* DOE reviewed this proposed rule under the provisions of the Regulatory Flexibility Act and the policies and procedures published on February 19, 2003.

The following sections detail DOE's IRFA for this test procedure rulemaking.

1. Description of Reasons Why Action Is Being Considered

DOE is proposing to amend the existing DOE test procedures for CRACs to reflect updates to the relevant industry test standard, pursuant to the relevant statutory provisions of EPCA.

2. Objective of, and Legal Basis for, Rule

EPCA, as amended, requires that the test procedures for commercial package air conditioning and heating equipment, which includes CRACs, be those generally accepted industry testing procedures or rating procedures developed or recognized by AHRI or by ASHRAE, as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) Further, if such an industry test procedure is amended, DOE must amend its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B))

EPCA also requires that, at least once every 7 years, DOE must evaluate test procedures for each type of covered equipment, including CRACs, 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. 614(a)(1)(A))

DOE is publishing this NOPR proposing amendments to the test procedure for CRACs in satisfaction of the aforementioned obligations under EPCA.

3. Description and Estimate of Small Entities Regulated

DOE uses the Small Business Administration (SBA) small business size standards to determine whether manufacturers qualify as small businesses, which are listed by the North American Industry Classification System (NAICS).[33] The SBA considers a business entity to be a small business, if, together with its affiliates, it employs less than a threshold number of workers specified in 13 CFR part 121.

CRAC manufacturers are classified under NAICS code 333415, ''Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing.'' In 13 CFR 121.201, the SBA sets a threshold of 1,250 employees or fewer for an entity to be considered as a small business for this category.

DOE utilized the California Energy Commission's Modernized Appliance Efficiency Database System (''MAEDbS'') [34] and DOE's Compliance Certification Database (''CCD'') [35] in identifying potential small businesses that manufacture CRACs covered by this rulemaking. DOE used subscription-based business information tools (*e.g.,* reports from Dun & Bradstreet [36]) to determine headcount and revenue of those small businesses. DOE identified nine companies that are original equipment manufacturers (OEMs) of CRACs covered by this rulemaking. DOE screened out companies that do not meet the definition of a ''small business'' or are foreign-owned and operated. DOE identified three small, domestic OEMs for consideration. One small, domestic OEM is not an AHRI member, while the other two small, domestic OEMs are AHRI members.

4. Description and Estimate of Compliance Requirements

In this NOPR, DOE is proposing to relocate the current DOE test procedure to a new appendix E of subpart F of part 431 (''appendix E'') without change. DOE is also proposing an amended test procedure at appendix E1 to subpart F of part 431 (''appendix E1''). Specifically, DOE is proposing in appendix E1 to adopt the updated draft industry test standard AHRI 1360–202X Draft for CRACs. Additionally, this NOPR seeks to amend certain representation and enforcement provisions for CRACs in 10 CFR part 429.

Appendix E does not contain any changes from the current Federal test procedure, and, therefore, would have no cost to industry and would not require retesting solely as a result of DOE's adoption of this proposed amendment to the test procedure, if made final.

The proposed test procedure in appendix E1 includes amendments for measuring CRAC energy efficiency using the NSenCOP metric so as to be consistent with the updated draft industry test procedure. Should DOE adopt amended energy conservation standards in the future denominated in terms of NSenCOP, the Department

[33] The size standards are listed by NAICS code and industry description and are available at: *www.sba.gov/document/support-table-size-standards* (Last accessed on August 30, 2021).

[34] MAEDbS can be accessed at *www.cacertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx* (Last accessed August 30, 2021).

[35] Certified equipment in the CCD are listed by product class and can be accessed at *www.regulations.doe.gov/certification-data/#q=Product_Group_s%3A** (Last accessed August 30, 2021).

[36] Market research available at: *app.dnbhoovers.com* (Last accessed August 30, 2021).

expects there would not be an increase in third-party lab testing costs per unit relative to the current Federal test procedure. DOE estimates such testing costs to be $10,200 per unit for physical testing. DOE has tentatively concluded that the proposed test procedure may require re-rating of CRAC models; however, this would not be mandatory until such time as DOE amends the energy conservation standards for CRACs based on NSenCOP, should DOE adopt such amendments.

If CRAC manufacturers conduct physical testing to certify a basic model, two units are required to be tested per basic model. However, manufacturers are not required to perform laboratory testing on all basic models, as CRAC manufacturers may elect to use AEDMs.[37] An AEDM is a computer modeling or mathematical tool that predicts the performance of non-tested basic models. These computer modeling and mathematical tools, when properly developed, can provide a means to predict the energy usage or efficiency characteristics of a basic model of a given covered product or equipment and reduce the burden and cost associated with testing.

Small businesses would be expected to have different potential regulatory costs depending on whether they are a member of AHRI. DOE understands that all AHRI members and all manufacturers currently certifying to the AHRI Directory will be testing their CRAC models in accordance with the final version of AHRI 1360–202X Draft, the industry test procedure DOE is proposing to incorporate by reference (if finalized and consistent with AHRI 1360–202X Draft), and using AHRI's certification program, which has already been updated to include the NSenCOP metric.

The proposed test procedure amendments would not add any additional testing burden to manufacturers which are members of AHRI, as those members currently are or soon will be using the finalized version of the AHRI 1360–202X draft test procedure. If DOE were to adopt energy conservation standards denominated in terms of the NSenCOP metric, the proposed test procedure amendments may, however, result in re-rating costs for manufacturers which are not AHRI members (currently one identified OEM).

DOE estimated the range of additional potential testing costs for the single small CRAC manufacturer which is not an AHRI member. This small business would only incur additional testing costs if they would not already be using the finalized version of the AHRI 1360–202X Draft to test their CRAC models. DOE estimates that this small business manufactures 113 basic models.

When developing cost estimates for this single, non-AHRI-member small business, DOE considered the cost to develop an AEDM, the costs to validate the AEDM through physical testing, and the cost per model to determine ratings using the AEDM. The Department anticipates that this small OEM would avail itself of the cost-saving option which the AEDM provides. DOE estimated the cost to develop and validate an AEDM for CRACs to be approximately $46,000, which includes physical testing of two models per validation class. Additionally, DOE estimated a cost of approximately $50 per basic model for determining energy efficiency using the validated AEDM. The estimated cost to rate the 113 basic models with the AEDM would be $5,650. Therefore, should DOE adopt amended energy conservation standards in the future denominated in terms of NSenCOP as the efficiency metric, this small business could incur total testing and rating costs of $51,650.

DOE understands the annual revenue of this small business to be approximately $17 million. Therefore, testing and AEDM costs could cause this small business manufacturer to incur costs of up to 0.30 percent of its annual revenue.

Issue 9: DOE requests comment on the number of small businesses DOE identified. DOE also seeks comment on the potential costs for the small business that is not an AHRI member and manufactures CRACs

5. Duplication, Overlap, and Conflict With Other Rules and Regulations

DOE is not aware of any rules or regulations that duplicate, overlap, or conflict with the rule being considered in this document.

6. Significant Alternatives to the Rule

DOE proposes to reduce burden on manufacturers, including small businesses, by allowing AEDMs in lieu of physically testing all basic models. The use of an AEDM is less costly than physical testing CRAC models. Without AEDMs, the average cost to rate all basic models for the small CRAC manufacturer (non-AHRI member) would be $1,152,600.

Additionally, DOE considered alternative test methods and modifications to the AHRI 1360–202X Draft test procedure for CRACs. However, DOE has tentatively determined that there are no better alternatives than the existing industry test procedures, in terms of both meeting the agency's objectives and reducing burden on manufacturers. Therefore, DOE is proposing to amend the existing DOE test procedure for CRACs through adoption of the substance of AHRI 1360–202X Draft. DOE intends to update the reference to the final published version of AHRI 1360–202X Draft in the final rule, unless there are substantive changes between the draft and published versions, in which case DOE may adopt the substance of the AHRI 1360–202X Draft or provide additional opportunity for comment on the changes to the industry consensus test procedure.

Manufacturers subject to DOE's energy efficiency standards may apply to DOE's Office of Hearings and Appeals for exception relief under certain circumstances. Manufacturers should refer to 10 CFR part 1003 for additional details.

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of CRACs 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 procedures, including any amendments adopted for those test procedures. DOE has established regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including commercial package air condition and heating equipment. (*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.

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.

[37] In accordance with 10 CFR 429.70.

D. Review Under the National Environmental Policy Act of 1969

DOE is analyzing this proposed regulation in accordance with the National Environmental Policy Act of 1969 (NEPA) and DOE's NEPA implementing regulations (10 CFR part 1021). DOE's regulations include a categorical exclusion for rulemakings interpreting or amending an existing rule or regulation that does not change the environmental effect of the rule or regulation being amended. 10 CFR part 1021, subpart D, appendix A5. DOE anticipates that this rulemaking qualifies for categorical exclusion A5 because it is an interpretive rulemaking that does not change the environmental effect of the rule and otherwise meets the requirements for application of a categorical exclusion. *See* 10 CFR 1021.410. DOE will complete its NEPA review before issuing the final rule.

E. Review Under Executive Order 13132

Executive Order 13132, ''Federalism,'' 64 FR 43255 (August 10, 1999), imposes certain requirements for 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. Public Law 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 *energy.gov/gc/office-general-counsel.* DOE examined this proposed rule according to UMRA and its statement of policy and determined that the 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 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). 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 CRACs 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 amendments to the Federal test procedure for CRACs are primarily in response to modifications to the applicable industry consensus test standards (*i.e.,* AHRI 1360–202X Draft, ANSI/ASHRAE 37–2009, and ANSI/ASHRAE 127–2020). DOE has evaluated these standards and is unable to conclude whether they fully comply with the requirements of section 32(b) of the FEAA (*i.e.,* whether they were developed in a manner that fully provides for public participation, comment, and review). DOE will consult with both the Attorney General and the Chairman of the FTC concerning the impact of these test procedures on competition, prior to prescribing a final rule.

M. Description of Materials Incorporated by Reference

In this NOPR, DOE proposes to incorporate by reference the following test standards:

(1) The draft test standard provided by AHRI, titled ''Performance Rating of Computer and Data Processing Room Air Conditioners (''Draft Standard'') AHRI Standard 1360–202X Draft. AHRI Standard 1360–202X Draft is a draft industry test procedure for measuring the performance of CRACs. AHRI Standard 1360–202X Draft is in draft form and its text was provided to the Department for the purposes of review only during the drafting of this NOPR. AHRI 1360–202X Draft has been attached in this docket for review. DOE intends to update the reference to the final published version of AHRI 1360–202X Draft in the Final Rule, unless there are substantive changes between the draft and published versions, in which case DOE may adopt the substance of the AHRI 1360–202X Draft or provide additional opportunity for comment on the changes to the industry consensus test procedure.

(2) The test standard published by ASHRAE, titled ''Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners,'' ANSI/ASHRAE Standard 127–2020. ANSI/ASHRAE Standard 127–2020 is an industry-accepted test procedure for measuring the performance of CRACs. ANSI/ASHRAE Standard 127–2020 is available on ANSI's website at *webstore.ansi.org/standards/ashrae/ansiashrae1272020.*

(3) The test standard published by ASHRAE, titled ''Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment,'' ANSI/ASHRAE Standard 37–2009. ANSI/ASHRAE Standard 37–2009 is an industry-accepted test procedure that provides a method of test for many categories of air conditioning and heating equipment. ANSI/ASHRAE Standard 37–2009 is available on ANSI's website at *webstore.ansi.org/RecordDetail.aspx?sku=ANSI%2FASHRAE+Standard+37-2009.*

(4) The test standard published by ASHRAE, titled ''Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners,'' ANSI/ASHRAE Standard 127–2007. ANSI/ASHRAE Standard 127–2007 is an industry-accepted test procedure for measuring the performance of CRACs. ANSI/ASHRAE Standard 127–2007 is available on ANSI's website at *https://webstore.ansi.org/standards/ashrae/ansiashrae1272007.*

The following standards were previously approved for incorporation by reference in the section where they appear and no change is proposed: AHRI 210/240–2008, AHRI 340/360–2007, ISO Standard 13256–1, AHRI 1230–2010, AHRI 390–2003.

V. Public Participation

A. Participation in the Webinar

The time and date of the webinar 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: *www.energy.gov/eere/buildings/public-meetings-and-comment-deadlines.* Participants are responsible for ensuring their systems are compatible with the webinar software.

B. Procedures for Submitting Prepared General Statements for Distribution

Any person who has an interest in the topics addressed in this proposed rulemaking, 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/public meeting. Such persons may submit requests to speak via email to the Appliance and Equipment Standards Program at: *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 rulemaking and the topics they wish to discuss. Such persons should also provide a daytime telephone number where they can be reached.

DOE requests persons selected to make an oral presentation to submit an advance copy of their statements at least two weeks before the webinar/public meeting. At its discretion, DOE may permit persons who cannot supply an advance copy of their statement to participate, if those persons have made advance alternative arrangements with the Building Technologies Office. As necessary, requests to give an oral presentation should ask for such alternative arrangements.

C. Conduct of the Webinar

DOE will designate a DOE official to preside at the webinar 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 to 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 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 summary of the proposals, allow time for prepared general statements by participants, and encourage all interested parties to share their views on issues affecting this 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 allow, 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 and comment on statements made by others. 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 rulemaking. The official conducting the webinar 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.

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 NOPR. 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 no later than the date provided in the **DATES** section at the beginning of this proposed rule. Interested parties may submit comments 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* web page 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 or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to *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. Comments and documents submitted via email 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. No telefacsimiles (faxes) will be accepted.

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

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

Confidential Business Information. 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:

Issue 1: DOE requests comment on the proposed definition for ''computer room air conditioner'' that distinguishes between CRACs and other categories of air conditioning equipment, based on the marketing of the equipment.

Issue 2: DOE requests comment on its proposal to define the following terms, consistent with AHRI 1360–202X Draft: Floor-mounted, ceiling-mounted, wall-mounted, roof-mounted, up-flow, down-flow, horizontal flow, up-flow ducted, up-flow non-ducted, ceiling-mounted ducted, ceiling-mounted non-ducted, and fluid economizer.

Issue 3: DOE requests comment on its proposal to adopt the NSenCOP metric for CRACs as part of the proposed test procedure in appendix E1, which would be used only if DOE were to prescribe energy conservation standards denominated in terms of NSenCOP in a future rulemaking. Additionally, DOE seeks feedback on whether the rating conditions in AHRI 1360–202X Draft are appropriately representative of field applications.

Issue 4: DOE seeks comment on its proposals regarding specific components in 10 CFR part 431, subpart F, appendix E1, 10 CFR 429.43, and 10 CFR 429.134.

Issue 5: DOE requests comment on its proposal to adopt the methods for comparing relative efficiency of standard and non-standard indoor fan motors and integrated fan and motor combinations specified in Section D3 of AHRI 1360–202X Draft in the proposed test procedure in 10 CFR part 431, subpart F, appendix E1, as well as in provisions for determination of represented values in 10 CFR 429.43(a) and provisions for DOE assessment and enforcement testing in 10 CFR 429.134.

Issue 6: DOE requests comment on its proposal regarding representations for CRAC basic models approved for use with multiple refrigerants.

Issue 7: DOE requests comment on its proposals related to represented values and verification testing of NSCC for CRACs.

Issue 8: DOE requests comment on its understanding of the impact of the test procedure proposals in this NOPR, specifically DOE's initial conclusion that the proposed DOE test procedure amendments, if finalized, would not increase testing burden on most CRAC manufacturers (*i.e.,* CRAC manufacturers who are AHRI members), compared to current industry practice as indicated by AHRI 1360–202X Draft, and that those proposed amendments would not have a significant impact on the remaining CRAC manufacturers (*i.e.,* CRAC manufacturers who are not AHRI members).

Issue 9: DOE requests comment on the number of small businesses DOE identified. DOE also seeks comment on the potential costs for the small business that is not an AHRI member and manufactures CRACs.

VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this notice of proposed rulemaking and request for comment.

List of Subjects

10 CFR Part 429

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Imports, Incorporation by reference, Intergovernmental relations, Reporting and recordkeeping requirements, Small businesses.

10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation, Incorporation by reference, Reporting and recordkeeping requirements.

Signing Authority

This document of the Department of Energy was signed on January 28, 2022, by Kelly J. Speakes-Backman, Principal Deputy 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 January 31, 2022.

Treena V. Garrett,

Federal Register Liaison Officer, U.S. Department of Energy.

For the reasons stated in the preamble, DOE is proposing to amend parts 429 and 431 of Chapter II of Title 10, Code of Federal Regulations as set forth below:

PART 429—CERTIFICATION, COMPLIANCE, AND ENFORCEMENT FOR CONSUMER PRODUCTS AND COMMERCIAL AND INDUSTRIAL EQUIPMENT

■ 1. The authority citation for part 429 continues to read as follows:

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

■ 2. Amend § 429.4 by revising paragraph (a) and redesignating paragraph (c)(2) as (c)(3), and adding new paragraph (c)(2) to read as follows:

§ 429.4 Materials incorporated by reference.

(a) Certain material is incorporated by reference into this subpart with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, DOE must publish a document in the **Federal Register** and the material must be available to the public. All approved material is available for inspection at the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, Sixth Floor, 950 L'Enfant Plaza SW, Washington, DC 20024, (202) 586–9127, *Buildings@ee.doe.gov, www.energy.gov/eere/buildings/building-technologies-office,* and may be obtained from the other sources in this section. Also, this material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: *fr.inspection@nara.gov,* or go to: *www.archives.gov/federal-register/cfr/ibr-locations.html.*

* * * * *

(c) * * *

(2) AHRI Standard 1360–202X Draft, (''AHRI 1360–202X Draft''), Performance Rating of Computer and Data Processing Room Air Conditioners, IBR approved for § 429.43.

* * * * *

■ 3. Amend § 429.43 by adding paragraphs (a)(3) and (4) to read as follows.

§ 429.43 Commercial heating, ventilating, air conditioning (HVAC) equipment.

(a) * * *

(3) *Product-specific provisions for determination of represented values.*

(i)–(iv) [Reserved]

(v) Computer room air conditioners. When certifying to standards in terms of NSenCOP, the following provisions apply.

(A) If a basic model is distributed in commerce and approved for use with multiple refrigerants, a manufacturer must determine all represented values for that basic model (*e.g.,* NSenCOP and net sensible cooling capacity) based on the refrigerant that results in the lowest cooling efficiency. A refrigerant is considered approved for use if it is listed on the nameplate of the outdoor unit. Per the definition of ''basic model'' in § 431.92, use of a refrigerant that requires different hardware (*i.e.,* compressors, heat exchangers, or air moving systems that are not the same or comparably performing), would represent a different basic model, and

separate representations would be required for each basic model.

(B) The represented value of net sensible cooling capacity must be between 95 percent and 100 percent of the mean of the capacities measured for the units in the sample selected as described in paragraph (a)(1)(ii) of this section, or between 95 percent and 100 percent of the net sensible cooling capacity output simulated by the AEDM as described in paragraph (a)(2) of this section.

(4) *Determination of represented values for individual models with specific components for computer room air conditioners.*

(i) If a manufacturer distributes in commerce individual models with one of the components listed in the following table, determination of represented values is dependent on the selected grouping of individual models into a basic model, as indicated in paragraphs (a)(4)(ii) through (v) of this section. For the purposes of this paragraph, ''otherwise identical'' means differing only in the presence of specific components listed in table 1 to this paragraph (a)(4)(i).

TABLE 1 TO PARAGRAPH (a)(4)(i)

Component	Description
Air Economizers	An automatic system that enables a cooling system to supply and use outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather.
Process Heat Recovery/Reclaim Coils/Thermal Storage.	A heat exchanger located inside the unit that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid.
Evaporative Pre-cooling of Air-cooled Condenser Intake Air.	Water is evaporated into the air entering the air-cooled condenser to lower the dry-bulb temperature and thereby increase efficiency of the refrigeration cycle.
Steam/Hydronic Heat Coils	Coils used to provide supplemental heat.
Refrigerant Reheat Coils	A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment.
Powered Exhaust/Powered Return Air Fans.	A powered exhaust fan is a fan that transfers directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building. A powered return air fan is a fan that draws building air into the equipment.
Compressor Variable Frequency Drive (VFD).	A device connected electrically between the equipment's power supply connection and the compressor that can vary the frequency of power supplied to the compressor in order to allow variation of the compressor's rotational speed. If the manufacturer chooses to make representations for performance at part-load and/or low-ambient conditions (*e.g.,* using the iNSenCOP metric), compressor VFDs must be treated consistently for all cooling capacity tests for the basic model (*i.e.,* if the compressor VFD is installed and active for the part-load and/or low-ambient tests, it must also be installed and active for the NSenCOP test).
Fire/Smoke/Isolation Dampers	A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment.
Non-Standard Indoor Fan Motors	The standard indoor fan motor is the motor specified in the manufacturer's installation instructions for testing and shall be distributed in commerce as part of a particular model. A non-standard motor is an indoor fan motor that is not the standard indoor fan motor and that is distributed in commerce as part of an individual model within the same basic model. For a non-standard indoor fan motor(s) to be considered a specific component for a basic model (and thus subject to the provisions of paragraph (a)(3)(v)(A)–(B) of this section), the following provisions must be met: (1) Non-standard indoor fan motor(s) must meet the minimum allowable efficiency determined per Section D.3.1 of AHRI 1360–202X Draft (incorporated by reference, see § 429.4) (*i.e.,* for non-standard indoor fan motors) or per Section D.3.2 of AHRI 1360–202X Draft for non-standard indoor integrated fan and motor combinations). If the standard indoor fan motor can vary fan speed through control system adjustment of motor speed, all non-standard indoor fan motors must also allow speed control (including with the use of VFD).
Humidifiers	A device placed in the supply air stream for moisture evaporation and distribution. The device may require building steam or water, hot water, electricity, or gas to operate.
Flooded Condenser Head Pressure Controls.	An assembly, including a receiver and head pressure control valve, used to allow for unit operation at lower outdoor ambient temperatures than the standard operating control system.
Chilled Water Dual Cooling Coils	A secondary chilled water coil added in the indoor air stream for use as the primary or secondary cooling circuit in conjunction with a separate chiller.
Condensate Pump	A device used to pump condensate and/or humidifier drain water from inside the unit to a customer drain outside the unit.

(ii) If a basic model includes only individual models distributed in commerce without a specific component listed in paragraph (4)(i) of this section, the manufacturer must determine represented values for the basic model based on performance of an individual model distributed in commerce without the component.

(iii) If a basic model includes only individual models distributed in commerce with a specific component listed in paragraph (4)(i) of this section, the manufacturer must determine represented values for the basic model based on performance of an individual model with the component present (and consistent with any component-specific test provisions specified in section 4 of appendix E1 to subpart F of part 431 of this chapter).

(iv) If a basic model includes both individual models distributed in commerce with a specific component listed in paragraph (4)(i) of this section and individual models distributed in commerce without that specific component, and none of the individual models distributed in commerce without the specific component are otherwise identical to any given individual model distributed in commerce with the specific component, the manufacturer must consider the performance of individual models with the component present when

determining represented values for the basic model (and consistent with any component-specific test provisions specified in section 4 of appendix E1 to subpart F of part 431 of this chapter).

(v) If a basic model includes both individual models distributed in commerce with a specific component listed in paragraph (4)(i) of this section and individual models distributed in commerce without that specific component, and at least one of the individual models distributed in commerce without the specific component is otherwise identical to any given individual model distributed in commerce with the specific component, the manufacturer may determine represented values for the basic model either:

(A) Based on performance of an individual model distributed in commerce without the specific component or

(B) based on performance of an individual model with the specific component present (and consistent with any component-specific test provisions specified in section 4 of appendix E1 to subpart F of part 431 of this chapter).

(vi) In any of the cases specified in paragraphs (a)(4)(ii) through (v) of this section, the represented values for a basic model must be determined through either testing (paragraph (a)(1) of this section) or an AEDM (paragraph (a)(2) of this section).

■ 4. Amend § 429.70 by revising the table in paragraph (c)(2)(iv) to read as follows:

§ 429.70 Alternative methods for determining energy efficiency and energy use.

* * * * *

(c) * * *

(2) * * *

(iv) * * *

TABLE 1 TO PARAGRAPH (c)(2)(iv)

Validation class	Minimum number of distinct models that must be tested per AEDM
Air-Cooled, Split and Packaged Air Conditioners (ACs) and Heat Pumps (HPs) less than 65,000 Btu/h Cooling Capacity (3-Phase).	2 Basic Models.
(A) Commercial HVAC validation classes	
Air-Cooled, Split and Packaged ACs and HPs greater than or equal to 65,000 Btu/h Cooling Capacity and Less than 760,000 Btu/h Cooling Capacity.	2 Basic Models.
Water-Cooled, Split and Packaged ACs and HPs, All Cooling Capacities	2 Basic Models.
Evaporatively-Cooled, Split and Packaged ACs and HPs, All Capacities	2 Basic Models.
Water-Source HPs, All Capacities	2 Basic Models.
Single Package Vertical ACs and HPs	2 Basic Models.
Packaged Terminal ACs and HPs	2 Basic Models.
Air-Cooled, Variable Refrigerant Flow ACs and HPs	2 Basic Models.
Water-Cooled, Variable Refrigerant Flow ACs and HPs	2 Basic Models.
Computer Room Air Conditioners, Air Cooled	2 Basic Models.
Computer Room Air Conditioners, Water-Cooled and Glycol-Cooled	2 Basic Models.
(B) Commercial water heater validation classes	
Gas-fired Water Heaters and Hot Water Supply Boilers Less than 10 Gallons	2 Basic Models.
Gas-fired Water Heaters and Hot Water Supply Boilers Greater than or Equal to 10 Gallons	2 Basic Models.
Oil-fired Water Heaters and Hot Water Supply Boilers Less than 10 Gallons	2 Basic Models.
Oil-fired Water Heaters and Hot Water Supply Boilers Greater than or Equal to 10 Gallons	2 Basic Models.
Electric Water Heaters	2 Basic Models.
Heat Pump Water Heaters	2 Basic Models.
Unfired Hot Water Storage Tanks	2 Basic Models.
(C) Commercial packaged boilers validation classes	
Gas-fired, Hot Water Only Commercial Packaged Boilers	2 Basic Models.
Gas-fired, Steam Only Commercial Packaged Boilers	2 Basic Models.
Gas-fired Hot Water/Steam Commercial Packaged Boilers	2 Basic Models.
Oil-fired, Hot Water Only Commercial Packaged Boilers	2 Basic Models.
Oil-fired, Steam Only Commercial Packaged Boilers	2 Basic Models.
Oil-fired Hot Water/Steam Commercial Packaged Boilers	2 Basic Models.
(D) Commercial furnace validation classes	
Gas-fired Furnaces	2 Basic Models.
Oil-fired Furnaces	2 Basic Models.
(E) Commercial refrigeration equipment validation classes [1]	
Self-Contained Open Refrigerators	2 Basic Models.
Self-Contained Open Freezers	2 Basic Models.
Remote Condensing Open Refrigerators	2 Basic Models.
Remote Condensing Open Freezers	2 Basic Models.
Self-Contained Closed Refrigerators	2 Basic Models.
Self-Contained Closed Freezers	2 Basic Models.
Remote Condensing Closed Refrigerators	2 Basic Models.

TABLE 1 TO PARAGRAPH (c)(2)(iv)—Continued

Validation class	Minimum number of distinct models that must be tested per AEDM
Remote Condensing Closed Freezers	2 Basic Models.

[1] The minimum number of tests indicated above must be comprised of a transparent model, a solid model, a vertical model, a semi-vertical model, a horizontal model, and a service-over-the counter model, as applicable based on the equipment offering. However, manufacturers do not need to include all types of these models if it will increase the minimum number of tests that need to be conducted.

* * * * *

■ 5. Section 429.134 is amended by adding paragraph (s) to read as follows:

§ 429.134 Product-specific enforcement provisions.

* * * * *

(s) *Computer room air conditioners.* The following provisions apply for assessment and enforcement testing of models subject to energy conservation standards denominated in terms of NSenCOP.

(1) *Verification of net sensible cooling capacity.* The net sensible cooling capacity of each tested unit of the basic model will be measured pursuant to the test requirements of part 431, subpart F, appendix E1 of this chapter. The mean of the net sensible cooling capacity measurement(s) will be used to determine the applicable energy conservation standards for purposes of compliance.

(2) *Specific components.* For basic models that include individual models distributed in commerce with any of the specific components listed at § 429.43(a)(4)(i), the following provisions apply. For purposes of this paragraph, ''otherwise identical'' means differing only in terms of the presence of specific components listed at § 429.43(a)(4)(i).

(i) If the basic model includes only individual models distributed in commerce with a specific component, or does not include any otherwise identical individual models without the specific component, DOE may assess compliance for the basic model based on testing of an individual model with the component present (and consistent with any component-specific test provisions specified in section 4 of appendix E1 to subpart F of part 431 of this chapter).

(ii) If the basic model includes both individual models distributed in commerce with a specific component and otherwise identical individual models without the specific component, DOE will assess compliance for the basic model based on testing an otherwise identical model within the basic model that does not include the component, unless DOE is not able to obtain an individual model for testing that does not include the component. In such a situation, DOE will assess compliance for the basic model based on testing of an individual model with the specific component present (and consistent with any component-specific test provisions specified in section 4 of appendix E1 to subpart F of part 431 of this chapter).

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

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

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

■ 7. Section 431.92 is amended by:
■ a. Revising the introductory paragraph;
■ b. Adding, in alphabetical order, definitions for ''Ceiling-mounted,'' ''Ceiling-mounted ducted,'' ''Ceiling-mounted non-ducted'';
■ c. Revising the definition for ''Computer room air conditioner''; and
■ d. Adding, in alphabetical order, definitions for ''Down-flow,'' ''Floor-mounted,'' ''Fluid economizer,'' ''Horizontal-flow,'' ''Net sensible coefficient of performance, or NSenCOP'' ''Roof-mounted,'' ''Up-flow,'' ''Up-flow ducted,'' ''Up-flow non-ducted,'' and ''Wall-mounted.''

The revisions and additions read as follows:

§ 431.92 Definitions concerning commercial air conditioners and heat pumps.

The following definitions apply for purposes of this subpart F, and of subparts J through M of this part. Any words or terms not defined in this section or elsewhere in this part shall be defined as provided in 42 U.S.C. 6311. For definitions that reference the application for which the equipment is marketed, DOE will consider any publicly available document published by the manufacturer (*e.g.,* product literature, catalogs, and packaging labels) to determine marketing intent.

Note: For definitions in this section that pertain to computer room air conditioners, italicized terms within a definition indicate terms that are separately defined in this section.

* * * * *

Ceiling-mounted means a configuration of a *computer room air conditioner* for which the unit housing the evaporator coil is configured for indoor installation on or through a ceiling.

Ceiling-mounted ducted means a configuration of a *ceiling-mounted computer room air conditioner* that is configured for use with discharge ducting (even if the unit is also configurable for use without discharge ducting).

Ceiling-mounted non-ducted means a configuration of a *ceiling-mounted computer room air conditioner* that is configured only for use without discharge ducting.

* * * * *

Computer room air conditioner means commercial package air-conditioning and heating equipment (packaged or split) that is marketed for use in computer rooms, data processing rooms, or other information technology cooling applications and not a covered consumer product under 42 U.S.C. 6291(1)–(2) and 42 U.S.C. 6292. A computer room air conditioner may be provided with, or have as available options, an integrated humidifier, temperature and/or humidity control of the supplied air, and reheating function. Computer room air conditioners include, but are not limited to, the following configurations as defined in this section: *Down-flow, horizontal-flow, up-flow ducted, up-flow non-ducted, ceiling-mounted ducted, ceiling mounted non-ducted, roof-mounted,* and *wall-mounted.*

* * * * *

Down-flow means a configuration of *floor-mounted computer room air conditioner* in which return air enters above the top of the evaporator coil and discharge air leaves below the bottom of the evaporator coil.

* * * * *

Floor-mounted means a configuration of a *computer room air conditioner* for which the unit housing the evaporator coil is configured for indoor installation on a solid floor, raised floor, or floor-

stand. Floor-mounted *computer room air conditioners* are one of the following three configurations: *Down-flow, horizontal-flow,* and *up-flow.*

Fluid economizer means an option available with a *computer room air conditioner* in which a fluid (other than air), cooled externally from the unit, provides cooling of the indoor air to reduce or eliminate unit compressor operation when outdoor temperature is low. The fluid may include, but is not limited to, chilled water, water/glycol solution, or refrigerant. An external fluid cooler such as, but not limited to a dry cooler, cooling tower, or condenser is utilized for heat rejection. This component is sometimes referred to as a free cooling coil, econ-o-coil, or economizer.

* * * * *

Horizontal-flow means a configuration of a *floor-mounted computer room air conditioner* that is neither a *down-flow* nor an *up-flow* unit.

* * * * *

Net sensible coefficient of performance, or *NSenCOP,* means a ratio of the net sensible cooling capacity in kilowatts to the total power input in kilowatts for *computer room air conditioners,* as measured in appendix E1 of this subpart.

* * * * *

Roof-mounted means a configuration of a *computer room air conditioner* that is not *wall-mounted,* and for which the unit housing the evaporator coil is configured for outdoor installation.

* * * * *

Up-flow means a configuration of a *floor-mounted computer room air conditioner* in which return air enters below the bottom of the evaporator coil and discharge air leaves above the top of the evaporator coil.

Up-flow ducted means a configuration of an *up-flow computer room air conditioner* that is configured for use with discharge ducting (even if the unit is also configurable for use without discharge ducting).

Up-flow non-ducted means a configuration of an *up-flow computer room air conditioner* that is configured only for use without discharge ducting.

* * * * *

Wall-mounted means a configuration of a *computer room air conditioner* for which the unit housing the evaporator coil is configured for installation on or through a wall.

* * * * *

■ 8. Amend § 431.95 by:
■ a. Revising paragraph (a);
■ b. Adding new paragraph (b)(8);
■ c. Revising paragraphs (c)(2) and (4); and
■ d. Adding paragraph (c)(5).

The additions and revisions read as follows:

§ 431.95 Materials incorporated by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, DOE must publish a document in the **Federal Register** and the material must be available to the public. All approved material is available for inspection at the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, Sixth Floor, 950 L'Enfant Plaza SW, Washington, DC 20024, (202)–586–9127, *Buildings@ee.doe.gov*, *https://www.energy.gov/eere/buildings/building-technologies-office,* and may be obtained from the other sources in this section. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: *fr.inspection@nara.gov,* or go to: *www.archives.gov/federal-register/cfr/ibr-locations.html.*

(b) * * *

* * * * *

(8) AHRI Standard 1360–202X Draft, (''AHRI 1360–202X Draft''), ''Performance Rating of Computer and Data Processing Room Air Conditioners (''Draft Standard'')'', IBR approved for appendix E1 to this subpart.

(c) * * *

(2) ANSI/ASHRAE Standard 37–2009, (''ANSI/ASHRAE 37''), ''Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment,'' ASHRAE approved June 24, 2009, IBR approved for § 431.96, and appendices A and E1 to this subpart.

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(4) ANSI/ASHRAE Standard 127–2007, (''ANSI/ASHRAE 127–2007''), ''Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners,'' approved on June 28, 2007, IBR approved for § 431.96 and appendix E to this subpart.

(5) ANSI/ASHRAE Standard 127–2020, (''ANSI/ASHRAE 127–2020''), ''Method of Testing for Rating Computer and Data Processing Room Unitary Air Conditioners,'' ANSI approved on November 30, 2020, IBR approved for appendix E1 to this subpart.

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■ 9. Amend § 431.96 by revising paragraph (b)(1) and table 1 to § 431.96 (immediately following paragraph (b)(2)), to read as follows:

§ 431.96 Uniform test method for the measurement of energy efficiency of commercial air conditioners and heat pumps.

* * * * *

(b) * * * (1) Determine the energy efficiency of each type of covered equipment by conducting the test procedure(s) listed in table 1 of this section along with any additional testing provisions set forth in paragraphs (c) through (g) of this section and appendices A through E1 to this subpart, that apply to the energy efficiency descriptor for that equipment, category, and cooling capacity. The omitted sections of the test procedures listed in Table 1 of this section must not be used. For equipment with multiple appendices listed in Table 1, consult the notes at the beginning of those appendices to determine the applicable appendix to use for testing.

* * * * *

TABLE 1 TO PARAGRAPH (b)—TEST PROCEDURES FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS

Equipment type	Category	Cooling capacity	Energy efficiency descriptor	Use tests, conditions, and procedures [1] in	Additional test procedure provisions as indicated in the listed paragraphs of this section
Small Commercial Package Air-Conditioning and Heating Equipment.	Air-Cooled, 3-Phase, AC and HP.	<65,000 Btu/h	SEER and HSPF	AHRI 210/240–2008 (omit section 6.5).	Paragraphs (c) and (e).
	Air-Cooled AC and HP.	≥65,000 Btu/h and <135,000 Btu/h.	EER, IEER, and COP	Appendix A to this subpart.	None.
	Water-Cooled and Evaporatively-Cooled AC.	<65,000 Btu/h	EER	AHRI 210/240–2008 (omit section 6.5).	Paragraphs (c) and (e).

TABLE 1 TO PARAGRAPH (b)—TEST PROCEDURES FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS—Continued

Equipment type	Category	Cooling capacity	Energy efficiency descriptor	Use tests, conditions, and procedures [1] in	Additional test procedure provisions as indicated in the listed paragraphs of this section
		≥65,000 Btu/h and <135,000 Btu/h.	EER	AHRI 340/360–2007 (omit section 6.3).	Paragraphs (c) and (e).
	Water-Source HP	<135,000 Btu/h	EER and COP	ISO Standard 13256–1 (1998).	Paragraph (e).
Large Commercial Package Air-Conditioning and Heating Equipment.	Air-Cooled AC and HP.	≥135,000 Btu/h and <240,000 Btu/h.	EER, IEER and COP	Appendix A to this subpart.	None.
	Water-Cooled and Evaporatively-Cooled AC.	≥135,000 Btu/h and <240,000 Btu/h.	EER	AHRI 340/360–2007 (omit section 6.3).	Paragraphs (c) and (e).
Very Large Commercial Package Air-Conditioning and Heating Equipment.	Air-Cooled AC and HP.	≥240,000 Btu/h and <760,000 Btu/h.	EER, IEER and COP	Appendix A to this subpart.	None.
	Water-Cooled and Evaporatively-Cooled AC.	≥240,000 Btu/h and <760,000 Btu/h.	EER	AHRI 340/360–2007 (omit section 6.3).	Paragraphs (c) and (e).
Packaged Terminal Air Conditioners and Heat Pumps.	AC and HP	<760,000 Btu/h	EER and COP	Paragraph (g) of this section.	Paragraphs (c), (e), and (g).
Computer Room Air Conditioners	AC	<760,000 Btu/h	SCOP	Appendix E to this subpart [2].	None.
		<760,000 Btu/h	NSenCOP	Appendix E1 to this subpart [2].	None.
Variable Refrigerant Flow Multi-split Systems.	AC	<65,000 Btu/h (3-phase).	SEER	AHRI 1230–2010 (omit sections 5.1.2 and 6.6).	Paragraphs (c), (d), (e), and (f).
		≥65,000 Btu/h and <760,000 Btu/h.	EER	AHRI 1230–2010 (omit sections 5.1.2 and 6.6).	Paragraphs (c), (d), (e), and (f).
Variable Refrigerant Flow Multi-split Systems, Air-cooled.	HP	<65,000 Btu/h (3-phase).	SEER and HSPF	ANSI/AHRI 1230–2010 (omit sections 5.1.2 and 6.6).	Paragraphs (c), (d), (e), and (f).
		≥65,000 Btu/h and <760,000 Btu/h.	EER and COP	ANSI/AHRI 1230–2010 (omit sections 5.1.2 and 6.6).	Paragraphs (c), (d), (e), and (f).
Variable Refrigerant Flow Multi-split Systems, Water-source.	HP	<760,000 Btu/h	EER and COP	ANSI/AHRI 1230–2010 (omit sections 5.1.2 and 6.6).	Paragraphs (c), (d), (e), and (f).
Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps.	AC and HP	<760,000 Btu/h	EER and COP	AHRI 390–2003 (omit section 6.4).	Paragraphs (c) and (e).

[1] Incorporated by reference; see § 431.95.
[2] For equipment with multiple appendices listed in Table 1, consult the notes at the beginning of those appendices to determine the applicable appendix to use for testing.

* * * * *

Appendix B to Subpart F of Part 431 [Reserved]

■ 10. Add and reserve Appendix B to subpart F of part 431:

Appendix C to Subpart F of Part 431 [Reserved]

■ 11. Add and reserve Appendix C to subpart F of part 431.

Appendix D to Subpart F of Part 431 [Reserved]

■ 12. Add and reserve Appendix D to subpart F of part 431.

■ 13. Add Appendix E to subpart F of part 431 to read as follows:

Appendix E to Subpart F of Part 431—Uniform Test Method for Measuring the Energy Consumption of Computer Room Air Conditioners

Note: Prior to the compliance date for any amended energy conservation standards based on NSenCOP for computer room air conditioners, representations with respect to energy use or efficiency of this equipment, including compliance certifications, must be based on testing pursuant to this appendix. Starting on the compliance date for any amended energy conservation standards for this equipment based on NSenCOP, any representations, including compliance certifications, made with respect to the energy use, power, or efficiency of this equipment must be based on testing pursuant to appendix E1 of this subpart. Manufacturers may use appendix E1 to certify compliance with any amended standards prior to the applicable compliance date for those standards.

1. *Incorporation by Reference.* DOE incorporated by reference in § 431.95, the entire standard for ANSI/ASHRAE 127–2007. However, certain enumerated provisions of ANSI/ASHRAE 127–2007, as set forth in paragraphs (a) of this section, are inapplicable. To the extent that there is a conflict between the terms or provisions of a referenced industry standard and the CFR, the CFR provisions control.

(a) ANSI/ASHRAE 127–2007:

(i) Section 5.11 is inapplicable as specified in section 2 of this appendix.

(ii) [Reserved].

2. *General.* Determine the sensible coefficient of performance (SCOP) in accordance with ANSI/ASHRAE 127–2007, ''Method of Testing for Rating Computer and Data Processing Room Unitary Air-Conditioners''; however, Section 5.11, *Tolerances,* of ANSI/ASHRAE 127–2007 is not applicable. In addition, the instructions in sections (3) through (4) of this appendix apply in determining SCOP. In cases where there is a conflict between the language of this appendix and ANSI/ASHRAE 127–2007, the language of this appendix takes precedence.

3. *Optional break-in period.* Manufacturers may optionally specify a ''break-in'' period, not to exceed 20 hours, to operate the equipment under test prior to conducting the test method specified in this appendix. A manufacturer who elects to use an optional compressor break-in period in its certification testing should record this period's duration as part of the information in the supplemental testing instructions under 10 CFR 429.43.

4. *Additional provisions for equipment set-up.* The only additional specifications that may be used in setting up the basic model for test are those set forth in the installation and operation manual shipped with the unit. Each unit should be set up for test in accordance with the manufacturer installation and operation manuals. Paragraphs 4.1 and 4.2 of this section provide specifications for addressing key information typically found in the installation and operation manuals.

4.1. If a manufacturer specifies a range of superheat, sub-cooling, and/or refrigerant pressure in its installation and operation manual for a given basic model, any value(s) within that range may be used to determine refrigerant charge or mass of refrigerant, unless the manufacturer clearly specifies a rating value in its installation and operation manual, in which case the specified rating value must be used.

4.2. The airflow rate used for testing must be that set forth in the installation and operation manuals being shipped to the commercial customer with the basic model and clearly identified as that used to generate the DOE performance ratings. If a rated airflow value for testing is not clearly identified, a value of 400 standard cubic feet per minute (scfm) per ton must be used.

■ 14. Add Appendix E1 to subpart F of part 431 to read as follows:

Appendix E1 to Subpart F of Part 431—Uniform Test Method for Measuring the Energy Consumption of Computer Room Air Conditioners

Note: Prior to the compliance date for any amended energy conservation standards based on NSenCOP for computer room air conditioners, representations with respect to energy use or efficiency of this equipment, including compliance certifications, must be based on testing pursuant to appendix E of this subpart. Starting on the compliance date for any amended energy conservation standards for this equipment based on NSenCOP, any representations, including compliance certifications, made with respect to the energy use, power, or efficiency of this equipment must be based on testing pursuant to this appendix. Manufacturers may use appendix E1 to certify compliance with any amended standards prior to the applicable compliance date for those standards.

1. *Incorporation by Reference.*

DOE incorporated by reference in § 431.95, the entire standards for AHRI 1360–202X Draft, ANSI/ASHRAE 127–2020, ANSI/ASHRAE Standard 37–2009. However, only certain enumerated provisions of AHRI 1360–202X Draft, ANSI/ASHRAE 127–2020 and ANSI/ASHRAE Standard 37–2009 apply as set forth in paragraphs (a), (b), and (c) of this section. To the extent that there is a conflict between the terms or provisions of a referenced industry standard and the CFR, the CFR provisions control.

(a) AHRI 1360–202X Draft:

(i) The following sections of Section 3. Definitions—3.1 (Air Sampling Device(s)), 3.4 (Computer and Data Processing Room Air Conditioner), 3.11 (Indoor Unit), 3.14 (Manufacturer's Installation Instruction), 3.16 (Net Sensible Cooling Capacity), 3.17 (Net Total Cooling Capacity), 3.21 (''Shall,'' ''Should,'' ''Recommended,'' or ''It Is Recommended''), 3.22 (Standard Air) and 3.23 (Standard Airflow) are applicable as specified in section 2(a)(i) of this appendix,

(ii) Section 5. Test Requirements, is applicable as specified in section 2(a)(ii) of this appendix,

(iii) The following sections of Section 6. Rating Requirements—6.1–6.3, 6.5 and 6.7 are applicable as specified in section 2(a)(iii) of this appendix,

(iv) Appendix C. Standard Configurations—Normative, is applicable as specified in section 2(a)(iv) of this appendix,

(v) Section D3 of Appendix D. Non-Standard Indoor Fan Motors for CRAC units, is applicable as specified in section 2(a)(v) of this appendix,

(vi) Appendix E. Method of Testing Computer and Data Processing Room Air Conditioners—Normative, is applicable as specified in section 2(a)(vi) of this appendix, and

(vii) Appendix F. Indoor and Outdoor Air Condition Measurement—Normative is applicable as specified in section 2(a)(vii) of this appendix.

(b) ANSI/ASHRAE 127–2020:

(i) Appendix A—Figure A–1, Test duct for measuring air flow and static pressure on downflow units, is applicable as specified in section 2(b)(i) of this appendix.

(c) ASHRAE 37–2009:

(i) Section 1 Purpose is inapplicable as specified in section 2(c)(i) of this appendix,

(ii) Section 2 Scope is inapplicable as specified in section 2(c)(ii) of this appendix, and

(iii) Section 4 Classification is inapplicable as specified in section 2(c)(iii) of this appendix.

2. General. Determine the net sensible coefficient of performance (NSenCOP), in accordance with AHRI 1360–202X Draft, ''Performance Rating of Computer And Data Processing Room Air Conditioners'', ANSI/ASHRAE 127–2020, and ANSI/ASHRAE 37–2009 ''Methods of Testing for Rating Electronically Driven Unitary Air-Conditioning and Heat-Pump Equipment''. However only enumerated provisions of AHRI 1360–202X Draft, ANSI/ASHRAE 127–2020 and ANSI/ASHRAE 37–2009 are applicable, as set forth in paragraphs (a), (b), and (c) of this appendix. In addition, the instructions in section 3 of this appendix apply to determining NSenCOP. In cases where there is a conflict between these sources, the language of this appendix takes highest precedence, followed by AHRI 1360–202X Draft, followed by ANSI/ASHRAE 127–2020, followed by ANSI/ASHRAE 37–2009. Any subsequent amendment to a referenced document by a standard-setting organization will not affect the test procedure in this appendix, unless and until this test procedure is amended by DOE. Material is incorporated as it exists on the date of the approval, and a notice of any change in the incorporation will be published in the **Federal Register**.

(a) *Included sections of AHRI 1360–202X Draft.*

(i) The following sub-sections of Section 3. Definitions—3.1 (Air Sampling Device(s)), 3.4 (Computer and Data Processing Room Air Conditioner), 3.11 (Indoor Unit), 3.14 (Manufacturer's Installation Instruction), 3.16 (Net Sensible Cooling Capacity), 3.17 (Net Total Cooling Capacity), 3.21 (''Shall,'' ''Should,'' ''Recommended,'' or ''It Is Recommended''), 3.22 (Standard Air) and 3.23 (Standard Airflow),

(ii) Section 5. Test Requirements,

(iii) The following sections of Section 6. Rating Requirements—6.1–6.3, 6.5 and 6.7,

(iv) Appendix C. Standard Configurations—Normative,

(v) Section D3 of Appendix D. Non-Standard Indoor Fan Motors for CRAC units,

(vi) Appendix E. Method of Testing Computer and Data Processing Room Air Conditioners—Normative, and

(vii) Appendix F. Indoor and Outdoor Air Condition Measurement—Normative.

(b) *Included section of ANSI/ASHRAE 127–2020*

(i) Figure A-1, Test duct for measuring air flow and static pressure on downflow units,

(ii) [Reserved].

(c) *Excepted sections of ANSI/ASHRAE 37–2009:*

(i) Section 1. Purpose,

(ii) Section 2. Scope,

(iii) Section 4. Classifications.

3. *Test Conditions.*

3.1. *Test Conditions for Certification.* When testing to certify to the energy conservation standards in § 431.97, test use the ''Indoor Return Air Temperature Standard Rating Conditions'' and ''Heat Rejection/Cooling Fluid Standard Rating Conditions'' conditions, as specified in Tables 3 and 4 of AHRI 1360–202X Draft, respectively.

4. *Set-Up and Test Provisions for Specific Components.* When testing a unit that includes any of the features listed in Table 4.1 of this appendix, test in accordance with the set-up and test provisions specified in Table 4.1 of this appendix.

TABLE 4.1—TEST PROVISIONS FOR SPECIFIC COMPONENTS

Component	Description	Test provisions
Air Economizers	An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mid or cold weather.	For any air economizer that is factory-installed, place the economizer in the 100% return position and close and seal the outside air dampers for testing. For any modular air economizer shipped with the unit but not factory-installed, do not install the economizer for testing.
Process Heat recovery/Reclaim Coils/Thermal Storage.	A heat exchanger located inside the unit that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid.	Disconnect the heat exchanger from its heat source for testing.
Evaporative Pre-cooling of Condenser Intake Air.	Water is evaporated into the air entering the air-cooled condenser to lower the dry-bulb temperature and thereby increase efficiency of the refrigeration cycle.	Disconnect the unit from the water supply for testing (*i.e.,* operate without active evaporative cooling).
Steam/Hydronic Heat Coils	Coils used to provide supplemental heat	Test with steam/hydronic heat coils in place but providing no heat.
Refrigerant Reheat Coils	A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment.	De-activate refrigerant re-heat coils so as to provide the minimum (none if possible) reheat achievable by the system controls.
Fire/Smoke/Isolation Dampers.	A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment.	For any fire/smoke/isolation dampers that are factory-installed, close and seal the dampers for testing. For any modular fire/smoke/isolation dampers shipped with the unit but not factory-installed, do not install the dampers for testing.
Harmonic Distortion Mitigation Devices.	A high voltage device that reduces harmonic distortion measured at the line connection of the equipment that is created by electronic equipment in the unit.	Remove harmonic distortion mitigation devices for testing.
Humidifiers	A device placed in the supply air stream for moisture evaporation and distribution. The device may require building steam or water, hot water, electricity, or gas to operate.	Test with humidifiers in place but providing no humidification.
Electric Reheat Elements	Electric reheat elements and controls that are located downstream of the cooling coil that may heat the air using electrical power during the dehumidification process.	Test with electric reheat elements in place but providing no heat.
Non-standard Power Transformer.	A device applied to a high voltage load that transforms input electrical voltage to that voltage necessary to operate the load.	Disable the non-standard power transformer during testing.
Chilled Water Dual Cooling Coils.	A secondary chilled water coil added in the indoor air stream for use as the primary or secondary cooling circuit in conjunction with a separate chiller.	Test with chilled water dual cooling coils in place but providing no cooling.
High-Effectiveness Indoor Air Filtration.	Indoor air filters with greater air filtration effectiveness than Minimum Efficiency Reporting Value (MERV) 8 for ducted units and MERV 1 for non-ducted units.	Test with the filter offered by the manufacturer with the least air filtration effectiveness that meets or exceeds MERV 8 for ducted units and MERV 1 for non-ducted units.

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