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CALIFORNIA
ENERGY COMMISSION

STAFF EVALUATION

Mechanical Acceptance Test Technician Certification Provider 2019 Update Review: Refrigeration Service Engineers Society

Compliance Review for the 2019 California Building Energy Efficiency Standards

Gavin Newsom, Governor
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California Energy Commission

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ABSTRACT

Per the requirements in §10-103.2(d) of the *2019 Building Energy Efficiency Standards*, approved mechanical acceptance test technician certification providers must report to the California Energy Commission adjustments that they have made to the training curricula to address adopted updates to the Building Energy Efficiency Standards. The California Energy Commission adopted the *2019 Building Energy Efficiency Standards* on May 9, 2018, and they will go into effect on January 1, 2020. California Energy Commission staff notified the Refrigeration Service Engineers Society on January 10, 2019, that it must develop a report of adjustments it will make to its training curricula and application to address new and modified requirements in the *2019 Building Energy Efficiency Standards*. The Refrigeration Service Engineers Society submitted its update report on March 12, 2019.

Staff evaluated the training curricula adjustments and other application amendments submitted by the Refrigeration Service Engineers Society in its 2019 update report. Staff determined the proposed training updates and other application amendments the Refrigeration Service Engineers Society submitted met the requirements of §10-103.2(c) of the *2019 Building Energy Efficiency Standards* and its 2019 update report is approvable. Staff recommends that the California Energy Commission approve the Refrigeration Service Engineers Society training curricula adjustments and other application amendments.

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Keywords: nonresidential mechanical acceptance test technician certification provider, Refrigeration Service Engineers Society, mechanical systems, acceptance testing, Building Energy Efficiency Standards

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EXECUTIVE SUMMARY

The mechanical acceptance test technician certification provider program provides training, certification, and oversight of technicians and their employers who perform acceptance tests required by the Building Energy Efficiency Standards. Providers are professional organizations approved to provide the training curricula, as well as certification procedures, complaint resolution services (including disciplinary procedures), quality assurance, and accountability measures to technicians and their employers. Acceptance testing ensures that the technician installs and makes operational the equipment, controls, and systems in nonresidential buildings as required by the Building Energy Efficiency Standards.

Per §10-103.2(d) of the *2019 Building Energy Efficiency Standards*, providers are required to report to the California Energy Commission adjustments that they made to training curricula to address changes to acceptance testing requirements or to adopted updates to the Building Energy Efficiency Standards. The mechanical acceptance test technician certification provider must submit the update report no less than six months before the effective date of any newly adopted Building Energy Efficiency Standards. All reports shall contain a signed certification that the mechanical acceptance test technician certification provider meets all requirements in §10-103.2(c).

Providers must also demonstrate to the California Energy Commission that their acceptance testing certification services will comply with any applicable updates if their previously approved application does not comply with new or modified requirements. The training curricula adjustments and any other application amendments must be reviewed by the California Energy Commission according to criteria in §10-103.2(f) to determine if providers have satisfied the requirements under the Building Energy Efficiency Standards. The California Energy Commission adopted the *2019 Building Energy Efficiency Standards* on May 9, 2018, and they will go into effect on January 1, 2020.

The California Energy Commission approved the Refrigeration Service Engineers Society as a mechanical acceptance test technician certification provider on May 5, 2018. On January 10, 2019, California Energy Commission staff notified the Refrigeration Service Engineers Society it would need to develop its 2019 update report detailing adjustments it will make to its training curricula and application to address new and modified requirements in the *2019 Building Energy Efficiency Standards*. The Refrigeration Service Engineers Society submitted its 2019 update report on March 12, 2019.

California Energy Commission staff reviewed the Refrigeration Service Engineers Society 2019 update report and found that the training curriculum adjustments and other application amendments meet the requirements of §10-103.2(c)3 of the *2019 Building Energy Efficiency Standards* and determined that its report is approvable. Therefore, staff recommends that the California Energy Commission approve the Refrigeration Service Engineers Society 2019 update report.

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CHAPTER 1: Background

Mechanical Acceptance Test Technician Certification Provider Program

Acceptance testing ensures that technicians install and make operational the equipment, controls, and systems in nonresidential buildings as required by the Building Energy Efficiency Standards (Energy Code). The California Energy Commission (CEC) developed the acceptance test technician certification provider (ATTCP) program to improve compliance with lighting controls and mechanical acceptance test requirements.

The ATTCP program provides training, certification, and oversight of acceptance test technicians (ATTs) who perform the acceptance tests required by Energy Code, and their acceptance test employers (ATEs). ATTCPs are professional organizations approved by the CEC to develop and implement the training. They also provide certification procedures, complaint resolution (including disciplinary procedures), quality assurance, and accountability measures.

Requirements for 2019 Update Report

In accordance with §10-103.2(d) of the 2019 Energy Code, mechanical ATTCPs (M-ATTCPs) are required to report to the CEC adjustments that have been made to the training curricula to address changes to mechanical system acceptance testing requirements or any adopted updates to the Energy Code. The M-ATTCPs must submit the update reports no less than six months prior to the effective date of any newly adopted Energy Code, and shall contain a signed certification that the M-ATTCP meets all requirements for this program. M-ATTCPs must also demonstrate to the CEC that their acceptance testing certification services will comply with any applicable updates to the Energy Code.

These 2019 update reports submitted by M-ATTCPs are application amendments. According to §10-103.2(f) of the 2019 Energy Code, "amendments that contain any substantive changes shall be subject to the application review and determination process specified in §10-103.2(e)." According to §10-103(f)1B, "a substantive change is a change that substantively alters the requirements of the application materials for the ATTCP, ATT, or ATE." As such, staff will evaluate the training curricula adjustments and other application amendments contained within 2019 update reports to determine if a M-ATTCP's training, certification, and oversight services comply with the criteria and procedures set forth in §10-103.2(c)3 of the 2019 Energy Code.

Scope of 2019 Update Report

The 2019 Energy Code includes significant changes that affect the training requirements of the M-ATTCPs. The most significant of these changes include the addition of a new acceptance test and substantial alterations to existing acceptance tests. These changes will substantively alter the requirements of the M-ATTCP application materials for the M-ATTCP, ATT, and ATE. Therefore, the CEC must approve each M-ATTCP 2019 update report at a public business meeting. On January 10, 2019, staff issued a letter to all M-ATTCPs outlining the expected scope that the M-ATTCPs must address in their 2019 update reports. This scope includes the following:

1. Required updates to training materials for technicians performing work to reflect the 2019 Energy Code
    a. Substantive Changes:
        i. Occupant sensing zone controls acceptance testing
        ii. Functional testing for air handling unit (AHU) valves
        iii. Mandatory requirements for demand management controls
    b. Nonsubstantive Changes:
        i. Constant-volume, single-zone, air conditioners, and heat pumps
        ii. Automatic fault detection diagnostics (FDD) for AHUs and zone terminal units (ZTU)
        iii. Changes to definitions for the 2019 Energy Code
2. Voluntary Changes:
    a. The voluntary addition of air distribution acceptance testing for ATTs as a replacement of the Home Energy Rating System (HERS) rater
    b. The M-ATTCP may also propose other voluntary changes for staff to evaluate

Evaluation and Success Criteria

Staff must evaluate each change (required or voluntary) that an M-ATTCP makes to its application through the approval process for the update report, as described in the Energy Code. The staff evaluation includes two basic criteria: validation of submitted changes and compliance of those changes with the Energy Code.

Validation includes using third-party sources or filings, site visits to training centers, demonstration of software operability, and other methods as appropriate to ensure that the proposed changes are actual changes and consistent within the M-ATTCP application.

Staff determines compliance with the Energy Code by starting with §10-103.2(c), qualification and approval of certification providers. This section lays out the basic

requirements for all functions of the M-ATTCP. In addition to training curricula, laboratory training, minimum experience of ATTs, testing, recertification, training for ATEs, complaint procedures, revocation procedures, quality assurance and accountability, and certificate identification requirements (for ATTs and ATEs), it also requires that all M-ATTCPs provide training and certification for all acceptance tests listed in §120.5 of the Energy Code. M-ATTCP training must also comply with the requirements within the rest of the Energy Code including Part 6 and the Nonresidential Appendix (NA) (as referenced in §120.5).

Staff will only recommend approval of amendments that can successfully be validated and demonstrate compliance with the Energy Code. In terms of validation, staff must be able to determine if the proposed amendment is, in fact, real. For example, if an M-ATTCP states that it will use a training center for the required laboratory training/testing, staff will visit the facility to ensure that it is real and has the necessary facilities, equipment, and personnel to train and test ATTs. Staff validates training materials, and specifically, the training presentations for completing the acceptance test by their incorporation into the existing framework created by the original M-ATTCP application. For example, most M-ATTCPs use live training and proctored exams. Therefore, a presentation must fit within that framework created by the application. M-ATTCPs have also used classroom recordings as an alternative to live instruction. In those instances, staff reviews the recordings to make sure that they follow the approved presentations.

Demonstrating compliance with the Energy Code (§10-103.2, §120.5, NA7.5, and other sections of the Energy Code) is done by comparing the presentations with the requirements in the Energy Code. First, the presentation needs to be categorized by the requirements in §10-103.2, these are the basic requirements that the M-ATTCP must follow. Then presentations are compared to the requirements in §120.5, and then the requirements in NA7.5 explicitly. These sections may include references to other requirements within the Energy Code. Other sections of the Energy Code may add further requirements that need to be reflected in the training. These sections of the Energy Code describe the procedures to perform the acceptance test and under what conditions.

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CHAPTER 2:
M-ATTCP 2019 Update Report Evaluation

Introduction

Refrigeration Service Engineers Society (RSES) is a 501(c)(6) organization that provides, among other things, education, training, and certification preparation for heating, ventilation, air conditioning, and refrigeration (HVACR) professionals. RSES is a CEC approved M-ATTCP in good standing since its original approval on May 9, 2018, to present. The CEC adopted the 2019 Energy Code on May 9, 2018, which will go into effect on January 1, 2020. CEC staff notified RSES on January 10, 2019, that it must develop a 2019 update report detailing the adjustments it would make to its training curricula and application to address the new and modified requirements in the 2019 Energy Code.

RSES submitted their 2019 update report on March 12, 2019. CEC staff determined that RSES's 2019 update report was complete on July 29, 2019. Staff reviewed RSES's 2019 update report according to the specified in §10-103.2(e) of the 2019 Energy Code. Staff found that RSES's application amendments proposed in its 2019 update report are valid and comply with the 2019 Energy Code.

Amendments Proposed by RSES

The 2019 RSES update report includes the following scope of amendments to its M-ATTCP application:

1. Required updates to training materials for technicians performing work to reflect the 2019 Energy Code
    a. Substantive Changes:
        i. Occupant sensing zone controls acceptance testing
        ii. Functional testing for AHU valves
        iii. Mandatory requirements for demand management controls
    b. Nonsubstantive Changes:
        i. Constant-volume, single-zone, air conditioners, and heat pumps
        ii. Automatic FDD for AHU and ZTU
        iii. Minor updates to all training and testing materials.
    c. No proposed amendments needed to reflect changes in the 2019 Energy Code definitions
2. The voluntary addition of air distribution acceptance testing for ATTs as a replacement of the HERS rater

RSES submitted a confidentiality request for these materials, which the CEC approved on March 15, 2019. Therefore, staff cannot discuss the specifics of the material submitted by RSES in this public document. The overall scope of the classroom training materials follows and explains the application of, and acceptance test process for, the acceptance test requirements. The laboratory training follows the acceptance testing procedures. The classroom testing and test questions address both the basic knowledge of the prospective ATT regarding heating, ventilation, and air conditioning (HVAC) installation, code requirements, and specifically the acceptance test procedures. The laboratory testing procedure enables the proctor to evaluate the prospective ATTs knowledge and ability to execute the acceptance test procedure. The training and testing materials are consistent with the framework developed by the original RSES application and will enable RSES to use them for live instruction and proctored testing.

Required Updates to Training Materials

Substantive Changes

This section discusses the regulatory changes that staff deemed substantive based on the associated effect on M-ATTCPs at the organizational level.

Occupant Sensing Zone Controls Acceptance Testing

Regulatory Requirements

The CEC added this new acceptance test under the 2019 Energy Code for occupant sensing zone controls for space conditioning systems. The application of these systems are limited to spaces that are required to have occupant sensing controls (§130.1(c) and Table 120.1-A) where occupancy category permits ventilation air to be reduced to zero when the space is in occupied-standby mode. ATTs must become familiar with the situations under which the new standard is required as described by §120.2(e)3, §130.1(c), and Table 120.1-A. Additionally, the ATT needs to be familiar with the code sections referenced by Table 120.1-A including: §120.1(d)4E, §120.1(c)3, and exception to §120.1(g).

The ATTCP must provide the ATT with the appropriate training, testing, and certification to conduct the occupancy sensing zone controls acceptance test as prescribed in NA7.5.17, including the construction inspection and functional testing.

RSES Amendments

The RSES 2019 update report includes both classroom and laboratory training and testing materials for occupant sensing zone controls acceptance testing for the ATT and ATE. As described earlier, this material is confidential.

Staff Evaluation

The staff evaluation of the training and testing materials submitted in the RSES 2019 update report specific to occupant sensing zone controls included the following elements:

- Comparison of the RSES training and testing materials to the requirements in §120.2(e)3, §130.1(c), Table 120.1-A, §120.1(d)4E, §120.1(c)3, and the exception to §120.1(g). The training includes each of these sections and their impact on the acceptance test procedure and compliance documentation. The ATT checks these requirements during construction inspection by referencing the mechanical nonresidential compliance certification (NRCC-MCH-E) as approved by the authority having jurisdiction (AHJ).
- Comparison of the training and testing procedures to the requirements in NA7.5.17, including the construction inspection and functional testing. The training materials follow the procedures in NA7.5.17 including the additional necessary referenced requirements in §120.2(e)3.
- Comparison of the written, laboratory training, and testing materials to the compliance document for occupancy sensing zone controls, 2019-NRCA-MCH-19-A. The training includes screenshots of the 2019-NRCA-MCH-19-A to describe the procedures for the acceptance test and the means of completing the compliance document.

The training and testing materials for ATTs and ATEs are consistent with the requirements of the 2019 Energy Code and compliance documents for occupancy sensing zone controls.

Functional Testing for Air Handling Unit Valves

Regulatory Requirements

The CEC added a functional test to an existing acceptance test procedure under the 2019 Energy Code. The existing acceptance test procedure is for FDD for AHUs and ZTUs (NA7.5.12). The construction inspection portion of the acceptance test procedures is unchanged, consisting of one requirement (NA7.5.12.1). The requirement is to verify on the submittal documents or sensor specifications that locally installed supply air, outside air, and return air (if applicable) temperature sensors have an accuracy of ±2ºF over the range of 40ºF to 80ºF.

In addition to the existing functional test procedures for AHU economizers (NA7.5.12.2) and ZTUs (NA7.5.12.4), the 2019 Energy Code includes a functional test for AHU valves (NA7.5.12.3).

The ATTCP must provide the ATT with the appropriate training, testing, and certification to conduct the new functional test for AHU valves as prescribed in NA7.5.12.3 as a component of the overall acceptance test procedures for the Automatic FDDs for AHUs and ZTUs as prescribed in NA7.5.12, including the construction inspection.

RSES Amendments

The RSES 2019 update report includes both classroom and laboratory training and testing materials for AHU valves functional testing for the ATT and ATE. As described earlier, this material is confidential.

Staff Evaluation

The staff evaluation of the training and testing materials submitted in the RSES 2019 update report specific to AHU valves included the following elements:

- Comparison of the written training and testing materials to the functional testing requirements in NA7.5.12.3. The training material follows the procedures laid out in NA7.5.12.3, which includes the construction inspection and functional testing for FDDs, AHUs, and ZTUs.
- Comparison of the written and laboratory training and testing procedures to the requirements in §120.2(i), which requires the ATT to verify that the FDD is listed with the CEC or complies with a prescribed alternative procedure. The training includes the CEC web site link to listed FDDs and the procedures if the list does not include the device.
- Comparison of the written, laboratory training, and testing materials to the acceptance test compliance documents for AHU valves, 2019-NRCA-MCH-13-A. The training includes screenshots of the 2019-NRCA-MCH-13-A to describe the procedures for the acceptance test and the means of completing the compliance document.

The training and testing materials for ATTs and ATE are consistent with the requirements of the 2019 Energy Code and the compliance document for Automatic FDDs for AHUs and ZTUs, and AHU valves.

Mandatory Requirements for Demand Management Controls

Regulatory Requirements

The CEC moved the requirements for demand management controls from the Joint Appendix (JA) to Part 6 of the 2019 Energy Code, specifically JA5 to §110.12, and added the requirement for demand management controls to be compliant with Open Automated Demand Response (OpenADR) protocols. The most significant change was the requirement for ATTs to verify that the installed controls conform to the OpenADR protocols. The ATTs can verify conformance in two basic ways:

1. A printed copy of the OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN) certificate for the demand response control system, or
2. A certificate from the manufacturer stating that the demand response control system is capable of responding to a demand response signal from a certified OpenADR 2.0b VEN by automatically implementing the control functions requested by the VEN for the equipment it controls.

   Note: Demand responsive controls may incorporate and use protocols in addition to (not instead of) the protocols listed above.

To comply with this new requirement, the CEC modified the following compliance documents for the 2019 Energy Code:

- NRCA-MCH-03-A, Constant Volume, Single Zone, Unitary (Packaged And Split) Air Conditioner and Heat Pump Systems
- NRCA-MCH-11-A, Automatic Demand Shed Control
- NRCA-MCH-18-A, Energy Management Control System (EMCS)

NRCA-MCH-03-A and NRCA-MCH-11-A have the following additional requirements in the construction inspection procedures:

1. Verify that the manufacturer of the demand response control system have certified the device to the CEC as meeting all of the requirements in JA5 (§110.12(a)5).
2. Verify that the demand responsive controls are capable of communicating using one or more of the following for communications that occur within the building: Wi-Fi®, ZigBee®, BACnet®, Ethernet, or hard wired (§110.12(a)2).
3. Verify that when the demand responsive control communications are disabled (or unavailable), all demand responsive controls shall continue to perform all other control functions provided by the control (§110.12(a)4).
4. Verify the programmed controls provide an adjustable rate of change for the temperature setup increase, decrease, and reset (§110.12(b)4).
5. Verify that the controls have the following features in (§110.12(b)5):
    a. Disabled by authorized facility operators (§110.12(b)5A), and
    b. Manual control by authorized facility operators to allow adjustment of heating and cooling set points globally from a single point in the EMCS (§110.12(b)5B).

RSES Amendments

The RSES 2019 update report includes both classroom and laboratory training and testing materials for demand management controls for the ATT and ATE. As described earlier, this material is confidential.

Staff Evaluation

The Energy Code does not have explicit acceptance test requirements for EMCS. In §120.5 an EMCS must be compliant with the Energy Code. However, an EMCS compliance document has existed since the 2005 Energy Code. Additionally, the Energy Code makes many references to EMCS as an alternative to other localized control systems. Staff addressed this issue by revising the EMCS compliance document. The compliance document is now limited to construction inspection only that relies on the completion of other compliance documents for lighting controls, mechanical systems, and lab exhaust ventilation systems.

The staff evaluation of the training and testing materials submitted in the RSES 2019 update report specific to EMCS included the following elements:

- Comparison of the training and testing materials to the construction inspection requirements consistent with §110.12. The training directs the ATT to the documentation that the must be provided to verify the system is compliant with OpenADR protocols.
- Comparison of the training and testing materials to the requirements in the Energy Code that provide a compliance option for using an EMCS. The training directs the ATT to verify that the completion of compliance documents 2019-NRCA-MCH-03-A, 2019-NRCA-MCH-11-A, 2019-NRCA-LTI-02-A, 2019-NRCA-LTI-03-A, 2019-NRCA-LTI-04-A, 2019-NRCA-LTI-05-A, 2019-NRCA-LTO-02-A, and 2019-NRCA-PRC-14 as prescribed by the design documents and approved by the AHJ.
- Comparison of the training and testing materials to 2019-NRCA-MCH-18-A. The training materials include screen shots of the 2019-NRCA-MCH-18-A to describe the procedures for the acceptance test and the means of completing the compliance document.

The training and testing materials for ATTs and ATE are consistent with the requirements of the 2019 Energy Code and acceptance test compliance document for demand management controls as specified in §110.12.

Nonsubstantive Changes

This section discusses changes that staff deemed nonsubstantive because they do not substantively alter the requirements of the application materials for the M-ATTCPs, ATTs, or ATEs.

Constant-Volume, Single-Zone, Air Conditioners, and Heat Pumps

The acceptance test requirements for constant-volume, single-zone, air conditioners, and heat pumps (NA7.5.2) have not changed. However, the construction inspection requirements include verification and documentation of thermostat temperature adjustments (§120.2(b)) and pre-occupancy purge requirements (§120.1(d)2). Section 120.2(b) includes requirements for thermostatic controls for all single zone air conditioners and heat pumps. These requirements have changed to include new demand responsive controls certification specified in §110.2(c), §110.12(a), and if equipped with digital direct control (DDC) to the zone level §110.12(b).

Automatic FDD for AHU and ZTU.

The 2019 Energy Code includes minor changes to the FDD, AHU, and ZTU acceptance test procedures. The AHU acceptance test procedures include a construction inspection requirement. The ATT must verify on the submittal documents or sensor specifications that locally installed supply air, outside air, and return air (if applicable) temperature sensors have an accuracy of ±2ºF over the range of 40ºF to 80ºF. The functional testing procedures for AHUs with FDDs has minor changes, primarily for clarification. The 2019 Energy Code also includes a new functional test for AHU valves (as noted in the Substantive Changes above). The CEC did not modify the functional test for ZTUs.

Changes to Definitions for the 2019 Energy Code

Changes to definitions may have an impact on the training material provided by an M-ATTCP. The CEC updated the references to the most recent procedural standards from the American National Standards Institute (ANSI), Air Conditioning, Heating, and Refrigeration Institute (AHRI), American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), American Society for Testing and Materials (ASTM), Underwriters Laboratory (UL).

RSES Amendments

The RSES 2019 update report includes both classroom and laboratory training and testing materials for the ATT and ATE. RSES submitted a confidentiality request for these materials, which the CEC approved; therefore, staff cannot discuss the specifics of that material in this document. RSES updated the classroom and laboratory training and testing materials for these nonsubstantive changes.

Staff Evaluation

Staff has confirmed that, where necessary, the RSES training and testing materials have been update to address these nonsubstantive changes.

Voluntary Adjustments

Air Distribution Acceptance Testing for ATTs

Voluntary Provision

The 2019 Energy Code allows, but does not require, an M-ATTCP to provide training, certification, and oversight for ATTs to provide duct leakage test verification services normally provided by a HERS rater. An M-ATTCP must demonstrate compliance with all the following requirements, in addition to all the requirements of §10-103.2(c):

1. The M-ATTCP shall be approved and in good standing with the CEC in accordance with §10-103.2.
2. The M-ATTCP shall maintain, or cause to be maintained by suitable contractual requirements, an electronic database approved by the CEC that can record and hold for no less than five years duct leakage compliance documentation as performed by its own certified ATTs.
3. The M-ATTCP shall be capable of providing a print copy of each completed duct leakage acceptance test to the ATT that performed the test.
    a. The copy shall bear the logo or other identifying insignia as approved by the CEC on all pages of each duct leakage compliance document.
    b. The M-ATTCP shall provide a means of electronic verification of any duct leakage acceptance test compliance document to the AHJ in accordance with NA 1.3.4.

4. The M-ATTCP shall allow the CEC to access its electronic system with the authority to inspect all records.
5. The M-ATTCP shall provide all summary reports regarding the duct leakage compliance documents as requested by the CEC.
6. The M-ATTCP shall provide all training, certification, and oversight necessary to certify ATTs to perform the acceptance test as required in NA7.5.3 and NA2.
    a. All training and testing materials must comply with the applicable requirements in §10-103.2 and must be approved by the CEC.

The training requirements for the ATT must include all of the following:

- Prior to performing the duct leakage test, the ATT must verify and document that the installed ducting is sealed in compliance with §120.4. Therefore, the ATT training needs to have a reasonable understanding of the following standards and their application (required in §120.4):
    - *California Mechanical Code* (CMC) Sections 601.0 through 608.
    - ANSI / Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) 006-2006 3rd Ed.
    - UL 181, 181A, 181B, and 723.
    - ASTM C177, C518, C731, C732, and D2202.
    - How to recognize and verify a certificate issued by Department of Consumer Affairs, Bureau of Electronic and Appliance Repair, and Home Furnishing and Thermal Insulation that the insulation conductive thermal performance is approved pursuant to the California Code of Regulations, Title 24, Part 12, Chapters 12-13, Article 3, "Standards for Insulating Material."

NA2.1 contains the procedural requirements to perform the duct leakage testing. NA2.1 contains several references that the ATT must be familiar with in order to perform the duct leakage test consistently and in the appropriate situations. The referenced coded sections include §140.4(I)1, §140.3(a)1B, §141.0(b)2D, and §141.0(b)2E.

If the M-ATTCP does not make use of this voluntary provision, the M-ATTCP must still provide training, certification, and oversight for ATTs performing the duct leakage test. The installing technician (the ATT in this case) must perform the duct leakage test when required by the Energy Code (§140.4(I)1, §140.3(a)1B, §141.0(b)2D, and §141.0(b)2E). The HERS rater is then required to perform the verification of those duct leakage tests by sampling (NA1 & NA2).

Voluntary Change Proposed by RSES

The RSES 2019 update report includes the amendments to allow ATT certified technicians to perform air duct leakage testing in lieu of a HERS rater. The RSES 2019 update report includes the following statements of compliance:

1. RSES is an M-ATTCP that has been approved and is in good standing with the CEC in accordance with §10-103.2 since its original approval on May 9, 2018 to present.
2. RSES, through suitable contractual requirements, will maintain an electronic database approved by the CEC that can record and hold for no less than five years duct leakage acceptance test compliances documentation as performed by RSES certified mechanical ATTs.
3. Through the electronic database, RSES is capable of providing a print copy of each completed duct leakage acceptance test to the ATT that performed the test.
    a. The copy bears the logo or other identifying insignia as approved by the CEC on all pages of each duct leakage compliance document.
    b. Through the electronic database, RSES provides a means of electronic verification of any duct leakage acceptance test compliance document to the AHJ in accordance with NA 1.3.4.
4. The CEC staff have a user account to the RSES electronic system with the authority to inspect all records.
5. RSES has agreed to provide all summary reports regarding the duct leakage compliance documents as requested by the CEC.
6. RSES has developed and submitted all required training materials, testing materials, and oversight procedures necessary to certify ATTs to perform the acceptance test as require in NA7.5.3 and NA2.

Staff Evaluation

Staff has verified that RSES is a CEC approved M-ATTCP in good standing since their original approval on May 9, 2018 to present.

Staff has reviewed the written description of the database system that RSES will be using. RSES has contracted with ESCO Group to maintain the database system. On August 16, 2019, ESCO Group demonstrated that the database system is operational and compliant with the NA1.9.3 requirements. Staff has a user account for the ESCO Group system allowing access to all records. The ESCO Group database system is capable of storing and producing the compliance documents with suitable watermarks. ESCO Group and RSES have agreed to produce summary reports as requested by the CEC.

The RSES 2019 update report includes both classroom and laboratory training and testing materials for duct leakage testing for the ATT and ATE. As described earlier, this material is confidential. Staff reviewed the training and testing materials that consist of presentation slides for live instruction, which is consistent with the originally RSES M-ATTCP application as approved by the CEC. Staff compared this material to the requirements in §140.4(l)1, §140.3(a)1B, §141.0(b)2D, and §141.0(b)2E, as well as the

acceptance test procedures in NA2.1 and the compliance documents 2019-NRCA-MCH-04a-A and 2019-NRCA-MCH-04b-A. The training materials make direct reference to the Energy Standard sections identified that would trigger a duct leakage test and follow the procedure requirements for construction inspection and functional testing prescribed in NA2.1 and the compliance documents. The training materials also references the CMC, ANSI, ATSM, SMACNA, and duct insulation labeling for the installation of new ducting. Finally, the training material includes a discussion of the circumstances for completing either 2019-NRCA-MCH-04a-A or 2019-NRCA-MCH-04b-A, which is an option for the builder.

CHAPTER 3:
Staff Recommendations

Under §10-103.2(f)2 of the 2019 Energy Code, staff completed its evaluation of the application amendments RSES reported in its amended 2019 update report. Staff determined that the required substantive, nonsubstantive, and voluntary adjustments to RSES M-ATTCP program meet the requirements in §10-103.2(c) of the 2019 Energy Code. Staff recommends that the CEC approve the RSES 2019 update report and all application amendments.

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APPENDIX A:
Glossary

TERM	DEFINITION
AHRI Air Conditioning, Heating, and Refrigeration Institute	A North American trade association of manufacturers of air conditioning, heating, and commercial refrigeration equipment.
AHJ Authority Having Jurisdiction	A governmental entity having the authority to issue a building permit.
AHU Air Handling Unit	A device used to regulate and circulate air as part of a heating, ventilation, and air conditioning system.
ANSI American National Standards Institute	A private non-profit organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the United States.
ASHRAE American Society of Heating, Refrigeration, and Air Conditioning Engineers	Founded in 1894, ASHRAE is a global society focused on building systems, energy efficiency, indoor air quality, refrigeration, and sustainability. It serves as a source of technical standards and guidelines.
ASTM American Society for Testing and Materials	An international standards organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems, and services.
ATTCP Acceptance Test Technician Certification Provider	An agency, organization, or entity approved by the CEC to train and certify acceptance test technicians and acceptance test employers.
ATT Acceptance Test Technician	A field technician certified by an authorized acceptance test technician certification provider.
ATE Acceptance Test Employer	A person or entity that employs an acceptance test technician and is certified by an authorized acceptance test technician certification provider.

TERM	DEFINITION
BACnet® (Trademarked name)	A communications protocol for Building Automation and Control.
CEC	California Energy Commission
CMC California Mechanical Code	Title 24, Part 4 of the California Building Code
DDC Digital direct controls	Automated control of a condition or process by a digital device (computer). DDC is often used to control HVAC devices such as valves using microprocessors and software to perform the control logic.
EMCS Energy Management Control System	A computerized control system designed to regulate the energy consumption of a building by controlling the operation of energy consuming systems, such as the heating, ventilation, and air conditioning; lighting; and water heating systems.
Energy Code Building Energy Efficiency Standards	State regulations contained in Title 24, Parts 1 and 6 of the California Code of Regulations and the Reference Appendices.
Ethernet	A system for connecting a number of computer systems to form a local area network, with protocols to control the passing of information.
FDD Fault Detection Diagnostics	Embedded devices measuring a subset of temperatures, pressures, and humidity levels in several stages of the HVAC system.
HERS Home Energy Rating System	A program that provides the testing and rating procedures to measure the energy performance of a home, as well as addressing construction defects and poor equipment installation, including HVAC systems and insulation.
HVACR Heating, Ventilation, Air Conditioning, and Refrigeration	A mechanical system used to provide any, or all of, the needed heating, cooling, or refrigeration services to a building.

TERM	DEFINITION
HVAC Heating, Ventilation, and Air Conditioning	A mechanical system used to provide heating and cooling services to a building.
ICB International Certification Board	An HVAC testing, adjusting, and balancing, as well as an HVAC fire life safety certification provider.
ITI Industrial Training International	An industrial training and certification provider.
M-ATTCP Mechanical Acceptance Test Technician Certification Provider	An agency, organization, or entity approved by the CEC to train and certify acceptance test technicians and acceptance test employers specifically for mechanical acceptance testing.
NRCC-MCH-E Non-Residential Certificate of Compliance for Mechanical systems, completed by the design Engineer	A dynamic compliance document required to be completed by a professional engineer or other responsible person (as defined by §10-103(a)) to be submitted with the application for building permit to the AHJ.
NA Nonresidential Appendix	A supplementary code to the Building Energy Efficiency Standards applicable to nonresidential building projects.
OpenADR Open Automated Demand Response	A research and standards development effort for energy management led by North American research labs and companies.
RSES Refrigeration Service Engineers Society	An industry trust approved by the CEC as a nonresidential M-ATTCP.
SMACNA Sheet Metal and Air Conditioning Contractors' National Association	An international trade association.
UL Underwriters Laboratory	An ANSI accredited audited designator that develops laboratory technical procedures and test methods for a variety of industrial and commercial product for the purpose of comparison and demonstration of compliance.

TERM	DEFINITION
VEN Virtual End Node	Used in conjunction with OpenADR systems, a virtual end node is typically a "client" and can be an "Energy Management System," a thermostat or other end device that accepts the OpenADR signal from a server.
Wi-Fi® (Trademarked name)	A wireless networking technology that uses radio waves to provide wireless high-speed Internet and network connections.
ZigBEE® (Trademarked name)	A high-level communication protocol used to create personal area networks with small, low-power digital radios, designed for projects that need wireless connection.
ZTU Zone Terminal Unit	A small component that contains a heating coil, cooling coil, or automatic damper, or some combination of the three. Used to control the temperature of a single room.