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California Energy Commission

STAFF REPORT

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

Staff Compliance Review of the *2016 California Building Energy Efficiency Standards*

California Energy Commission

Edmund G. Brown Jr., Governor

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California Energy Commission

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ABSTRACT

California Energy Commission staff evaluated the Refrigeration Service Engineers Society's application to become a nonresidential mechanical acceptance test technician certification provider, which it submitted on December 12, 2016 and amended on March 6, 2018, following Section 10-103.2(e)1 of the *2016 Building Energy Efficiency Standards* (codified in Title 24, Part 1, Chapter 10, and Part 6 of the California Code of Regulations). With the exception of the quality assurance program, staff found that the Refrigeration Service Engineers Society's application complies with the requirements in Section 10-103.2(c) of the *2016 Building Energy Efficiency Standards*. Staff found that the Refrigeration Service Engineers Society's quality assurance program complies with the requirements in Section 10-103.2(c)3F of the proposed *2019 Building Energy Efficiency Standards*, which are equally as stringent as the *2016 Building Energy Efficiency Standards*. Staff recommends that the Energy Commission approve the quality assurance program compliance with Section 10-103.2(c)3F of the proposed *2019 Building Energy Efficiency Standards* in place of compliance with the *2016 Building Energy Efficiency Standards*. Staff recommends that the Energy Commission approve the Refrigeration Service Engineers Society's application, with a condition of approval (see Appendix B), to become a nonresidential mechanical acceptance test technician certification provider.

Keywords: Nonresidential mechanical acceptance test technician certification provider, Refrigeration Service Engineers Society, HVAC, Title 24

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EXECUTIVE SUMMARY

The Acceptance Test Technician Certification Provider Program provides training, certification, and oversight of acceptance test technicians who perform the acceptance tests required by California's *Building Energy Efficiency Standards*, as well as the acceptance test employers that employ technicians. Providers are professional organizations that are approved by the California Energy Commission to provide the training curricula for technicians and their employers, certification procedures, complaint resolution (including disciplinary procedures), quality assurance, and accountability measures. Acceptance testing ensures that installed equipment, controls, and systems in nonresidential buildings operate as required by the *Building Energy Efficiency Standards*.

The Refrigeration Service Engineers Society, a nonprofit trade association, submitted its application to the Energy Commission for approval as a nonresidential mechanical acceptance test technician certification provider on December 12, 2016. To address Energy Commission concerns regarding the Refrigeration Service Engineers Society's proposed quality assurance program, a revised application was submitted on March 6, 2018. This revised application proposes a quality assurance program to comply with requirements in the *2019 Building Energy Efficiency Standards* in place of the *2016 Building Energy Efficiency Standards* requirements.

Staff completed its evaluation of the Refrigeration Service Engineers Society's mechanical acceptance test technician certification provider application under Section 10-103.2(e)1 of the *2016 Building Energy Efficiency Standards*. On March 14, 2018, staff determined that Refrigeration Service Engineers Society's application is complete and complies with the requirements in Section 10-103.2(c) of the *2016 Building Energy Efficiency Standards*—except for the quality assurance section. Staff determined that the Refrigeration Service Engineers Society's quality assurance measures comply with the proposed regulations in Section 10-103.2(c)3F of the *2019 Building Energy Efficiency Standards*. Staff recommends that the Energy Commission approve the Refrigeration Service Engineers Society, with a condition of approval (see Appendix B), to be a nonresidential mechanical acceptance test technician certification provider.

CHAPTER 1: Introduction

The Acceptance Test Technician Certification Provider Program

The Acceptance Test Technician Certification Provider (ATTCP) Program provides training, certification, and oversight of acceptance test technicians (ATTs) who perform the acceptance tests required by California's *2016 Building Energy Efficiency Standards*[1] (Energy Standards), as well as the acceptance test employers (ATEs) that employ ATTs. ATTCPs are professional organizations required to provide training curriculum for technicians and their employers, certification procedures, complaint resolution (including disciplinary procedures), quality assurance, and accountability measures.

Acceptance testing ensures that installed equipment, controls, and systems in nonresidential buildings operate as required by the Energy Standards. The ATTCP Program was developed to improve compliance with lighting controls and mechanical acceptance test requirements.

Requirements for Applications

Per Section 10-103.2(f) of the 2016 Energy Standards, the Energy Commission shall review mechanical ATTCP applications according to the criteria and procedures in Section 10-103.2(c) to determine if the mechanical ATTCP meets the specified requirements for providing acceptance testing certification services. For the 2016 code cycle, the mechanical ATTCPs propose to comply with the proposed quality assurance requirements in Section 10-103.2(c)3F of the 2019 Energy Standards.[2] As a general policy, enforcement of or compliance with requirements of Part 6 that are not yet adopted is permitted if those requirements are more stringent than the current enforceable code. In this case, the 2016 Energy Standards cannot be implemented from a practical point of view by the ATTCP. As a result, the 2019 Energy Standards reflect a compromise agreement with the ATTCPs for a reasonable solution that is both robust for quality assurance and practical for the ATTCP to implement. Therefore, the Energy Commission staff will review mechanical ATTCP applications containing proposed quality assurance measures according to the criteria and procedures in Section 10-103.2(c) of the 2016 Energy Standards and Section 10-103.2(c)3F of the 2019 Energy Standards.

1 All references hereafter are to the *2016 Building Energy Efficiency Standards* (codified in Title 24, Part 6 of the California Code of Regulations) unless otherwise specified.

2 See Appendix A for an excerpt of the quality assurance requirements for the 2019 Energy Standards.

Refrigeration Service Engineers Society

The Refrigeration Service Engineers Society (RSES) is a nonprofit trade association that provides opportunities for enhanced technical competence by offering training, education, and certification to its members and the heating, ventilation, air conditioning, and refrigeration (HVACR) industry. RSES has chapter members in the United States and Canada and provides nonmember technicians with its training material in more than 50 countries.

RSES submitted an application to the California Energy Commission for approval to be a nonresidential mechanical ATTCP on December 12, 2016. To address Energy Commission concerns regarding its proposed quality assurance program, RSES submitted a revised application on March 6, 2018. This revised application proposes quality assurance measures to comply with requirements in the 2019 Energy Standards, which the Energy Commission is permitting for the 2016 code cycle.

Staff completed its evaluation of RSES's mechanical ATTCP application under Section 10-103.2(e)1 of the 2016 Energy Standards. On March 14, 2018, staff determined that RSES's application is complete and complies with the requirements in Section 10-103.2(c) of the 2016 Energy Standards—except for the quality assurance section. Staff determined that RSES's quality assurance measures comply with Section 10-103.2(c)3F of the 2019 Energy Standards. Staff recommends that the Energy Commission approve RSES, with a condition of approval,[3] to be a nonresidential mechanical acceptance test technician certification provider. This report is organized in the same order as Section 10-103.2(c) in the 2016 Energy Standards.

3 See Appendix B for a summary of the condition of approval.

CHAPTER 2:
Qualifications and Approval of ATTCPs

Requirement in Section 10-103.2(c)

Prospective ATTCPs shall submit a written application to the Energy Commission with a summary and the necessary background documents to explain how the following criteria and procedures have been met:

- Documentation of organization structure
- Certification procedures for employers
- Training and certificate procedures for technicians

Summary of Compliance Method for Applicant

RSES submitted its application to the Energy Commission for approval as a nonresidential mechanical ATTCP on December 13, 2016. The application included information and disclosures regarding RSES organizational structure, certification procedures for employers, and training and certification procedures for technicians.

On December 21, 2016, the Energy Commission approved RSES's application request for confidentiality for curriculum and testing materials as part of its efforts to become a nonresidential mechanical ATTCP.[4] The confidential material consists of training curriculum and modules addressing various technical areas in which an ATT and an ATE would need to demonstrate competence before being certified.

However, concerns regarding the quality assurance program initially proposed by RSES were raised, and the program was found to be noncompliant. Following quality assurance discussions for the 2019 Energy Standards and the decision that mechanical ATTCPs would be permitted to comply with the 2019 quality assurance requirements[5] for the 2016 code cycle, RSES submitted a revised application on March 6, 2018.

Staff Assessment

On January 18, 2017, Energy Commission staff reviewed and validated the confidential and nonconfidential portions of RSES's application and determined that the application contained sufficient information to be evaluated by staff (Section 10-103.2[e]1) to determine compliance with the requirements in Section 10-103.2(c). Moreover, on March 14, 2018, Energy Commission staff reviewed and validated the proposed quality

4 Approval of confidentiality docketed 13-ATTCP-01, TN 214967, December 21, 2016.
5 See Appendix A for an excerpt of the quality assurance requirements for the 2019 Energy Standards.

assurance program submitted by RSES on March 6, 2018. This staff report discusses how the RSES application meets each requirement of Section 10-103.2(c).

CHAPTER 3:
Applicant ATTCPs to Document Organizational Structure

Requirements in Section 10-103.2(c)1

The ATTCP shall provide written explanations of the organization type, bylaws, and ownership structure. The ATTCP shall explain in writing how its certification program meets the qualifications of Section 10-103.2(c) and how its organizational structure and procedures include independent oversight, quality assurance, supervision, and support of the acceptance test training and certification processes.

Summary of Compliance Method for Applicant

The Refrigeration Service Engineers Society (RSES) is a 501(c)(6) organization with members in chapters in the United States and Canada, with additional technicians routinely using its training material in 50 countries across six continents.

Since 1933, RSES has been a leader in training and education for professional HVACR technicians and contractors. RSES's vision statement asserts that RSES strives to be the definitive industry leader in all segments of the HVACR industry by providing superior educational training. Its mission statement affirms that RSES will provide opportunities for enhanced technical competence by offering comprehensive, cutting-edge education and certification to its members and the HVACR industry. RSES purports to advance the professionalism and proficiency of the industry through alliances with other HVACR associations.

RSES will create a "Title 24 Oversight and Accountability Program" to provide independent oversight and accountability measures such as independent oversight of the certification processes and procedures, computer-generated reports for each certified employer and technician, auditor visits to sites where certified technicians are completing acceptance tests when required, certification process evaluations, building department surveys to determine acceptance testing effectiveness, and expert review of the training curricula that covers Section 120.5.

RSES requires the following:

1. All employers and technicians must use the mechanical registry for completing and submitting Certificate of Acceptance Test compliance documents.
2. All technicians must carry photographic identification and their wallet-sized certification card when performing acceptance testing.
3. Each certification card will have a unique identification number.

In an agreement with RSES, the ESCO Group will provide data management services necessary for completing Nonresidential Certifications of Acceptance (NRCA)[6] compliance documents for submittal to enforcement agencies. The ESCO Group provides custom software development, certification (professional, industry, and government), and professional development to educators and trainers in the HVACR industry. Furthermore, the ESCO Group will use its proprietary software to aid in distributing the workload to available certified technicians and employers.

Staff Assessment

RSES is a nonprofit trade association that is tax exempt under the Internal Revenue Code Section 501(c)(6). The RSES uses the Employer Identification Number (EIN) 41-6037520. Staff has verified through the IRS that this EIN is registered to RSES and that RSES is a 501(c)(6) an exempt organization in good standing.

RSES's bylaws are consistent with an organization serving industry's interests to assure quality products and services. Its structure includes standing committees, a board of directors, and appointed officers.

Staff evaluated RSES's organizational structure and determined it meets the requirements in Section 10-103.2(c)1. A summary of the RSES application sections that demonstrate compliance with Section 10-103.2(c)1 is provided in Table 1.

Table 1: Summary of Application Compliance for Section 10-103.2(c)1

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Organization	501(c)(6) - Nonprofit Trade Association	X	
Ownership Structure	Nonprofit Organization	X	
Bylaws	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Bylaws (pages 2-18)	X	
Quality Assurance of the Certification Process	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Annual Audit (page 27)	X	

6 The California Energy Commission provides residential and nonresidential compliance documents that are used to demonstrate compliance with the Energy Standards. The Nonresidential Certificate of Acceptance (NRCA) series includes the acceptance testing for mechanical systems required in Section 120.5.

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Independent Oversight	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: CEC Title 24 Oversight and Accountability Program (pages 19-20)	X	
Supervision	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: CEC Title 24 Oversight and Accountability Program (page 19)	X	
Support of Acceptance Test Training and Certification Processes	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider	X	

Source: California Energy Commission

CHAPTER 4:
Certification of Employers

Requirement in Section 10-103.2(c)2

The ATTCP shall provide a written explanation of how its program includes certification and oversight of ATEs. This explanation shall document how the ATTCP ensures that the ATEs are providing quality control and appropriate supervision and support for ATTs.

Summary of Compliance Method for Applicant

RSES's application describes the eligibility requirements for becoming a nonresidential mechanical ATE. Each ATE must agree to comply with the Energy Standards and adhere to any regulations pertaining to the Energy Standards that are adopted by the Energy Commission. The ATE applicant must complete a minimum of four hours of instruction covering the scope and process of the acceptance tests in Section 120.5 of the Energy Standards. In advance of the class or webinar, applicants are required to read a summary of all the Energy Standards related to the specific acceptance tests in which they are seeking certification.[7] The class will review the acceptance tests, the purpose, when and under what circumstances they are applicable, and the specific sections in the Energy Standards related to each acceptance test, as well as the employer's administrative responsibility. Once RSES has determined the ATE applicant has complied with these requirements, RSES will administer an employer certification exam. The exam is a two-part written test: one part, will be "open book," which contains questions relating to the Energy Standards as it pertains to acceptance testing. The second part will be "closed book" and contains questions related to the employer's administrative responsibilities and RSES oversight policies.

Staff Assessment

The proposed training for ATE encompasses sections of the Energy Standards relevant to mechanical acceptance testing, including Sections 10-103, 10-103.2, 120.5 and the Nonresidential Reference Appendix NA7.5. The ATE training also includes a summary of Chapter 13 of the Nonresidential Compliance Manual. The scope of the instructional materials is a sufficient overview of the acceptance test requirements to allow for an understanding of the duties and responsibilities of both the ATE and ATT. Although the proposed testing does include an open-book section, the questions are sufficiently

7 See Sections 10-103.2, 120.5, and Nonresidential Reference Appendix NA7.5. This also includes Chapter 13 of the Compliance Manual, although the Compliance Manual is not regulation but merely advisory.

difficult to demonstrate the acquired knowledge by the ATE.

For certifications of ATEs, staff evaluated RSES's application and determined it meets the requirements in Section 10-103.2(c)2. A summary of RSES's application sections that demonstrate compliance with Section 10-103.2(c)2 is provided in Table 2.

Table 2: Summary of Application Compliance for Section 10-103.2(c)2

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Certification of ATE	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Employer Certification (page 22) Presentation – California Energy Commission Title 24, Part 6 Acceptance Testing Employer Training.pdf	X	
Oversight of ATE	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Complaints (page 23)	X	

Source: California Energy Commission

CHAPTER 5:
Hands-On Experience and Training

Requirements in Section 10-103.2(c)3A

ATTCPs shall include with their applications a complete copy of all training and testing procedures, manuals, handbooks, and materials. ATTCPs shall explain in writing how their training and certification procedures include, but are not limited to, the scope of the training. The scope of training shall include both hands-on experience and theoretical training to certify competency in the technologies and skills necessary to perform the acceptance tests.

Summary of Compliance Method for Applicant

The proposed RSES training program permits each technician to certify on each acceptance test. The intent of this approach is to be sensitive to the needs of the small HVAC contractors who would not benefit from training in all 17 acceptance tests that they will not use or require for their business models. The cost of training and certifying a technician in all protocols may result in excluding California's small HVAC contractors in the marketplace. Light or small commercial work is generally completed by contractors who do not possess the experience or knowledge working with hydronics, chillers, and thermal storage, or building and energy management systems. In an effort to be responsive to its membership and inclusive of the small HVAC commercial contractor, RSES is implementing a program that allows each contractor to certify on only those acceptance tests that they will actually use.

Each technician will select the acceptance test that he or she wishes to receive training and will submit an application for that particular test to RSES. Prior to admittance, applicants must demonstrate their understanding of the material by passing a prequalification exam. After receiving instruction on the acceptance test concepts and procedures, the ATT will then take an exit exam. If the ATT receives a passing score as determined by RSES, the ATT will gain certification for that particular acceptance test.

RSES relies on an online data registry to monitor certified technicians and employers, which restricts them to the acceptance tests for which they possess certification. Certification will require all applicants to pass an entrance exam, complete the necessary training, and pass an exit exam for classroom and laboratory curricula for each mechanical acceptance test.

RSES's proposed training for technicians includes classroom training and hands-on (laboratory) training in all mechanical acceptance tests specified by Section 120.5 of the Energy Standards. The training has 17 modules that encompass Appendix NA7.5 (subsections 1 through 17) "Installation and Acceptance Requirements for

Nonresidential Buildings and Covered Processes" in the *2016 Building Energy Efficiency Standards Nonresidential Appendices.*

Staff Assessment

Staff evaluated RSES's confidential and non-confidential training materials submitted in its application. The scope of the training materials includes both hands-on and theoretical training and covers all necessary subjects to complete the acceptance tests required in Section 120.5 of the Energy Standards. The instructional materials also include descriptions of the different types of equipment that the ATT is likely to encounter in the field and special instructions regarding the applicable acceptance tests.

Staff evaluated RSES's application regarding the scope of hands-on and theoretical training and determined it meets the requirements in Section 10-103.2(c)3A. A summary of RSES's application sections that demonstrate compliance with Section 10-103.2(c)3A is provided in Table 3.

Table 3: Summary of Application Compliance for Section 10-103.2(c)3A

REQUIREMENT	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Theoretical Training	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Employer Certification (page 22)	X	
Hands-On Experience	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Certification Exams (page 22)	X	

Source: California Energy Commission

CHAPTER 6:
Mechanical Acceptance Test Technician Training Curricula

Requirements in Sections 10-103.2(c)3B(i)

ATTCPs shall provide a complete copy of all training and testing procedures, manuals, handbooks, educational materials, and a written explanation of how training and certification procedures include, but are not limited to, the requirements in Sections 10-103.2(c)3B(i).

ATTCP training curricula for mechanical ATTs shall include, but not be limited to, the analysis, theory, and practical application of:

- Constant volume system controls.
- Variable-volume system controls.
- Air-side economizers.
- Air distribution system leakage.
- Demand-controlled ventilation with CO_2 sensors.
- Demand-controlled ventilation with occupancy sensors.
- Automatic demand shed controls.
- Hydronic valve leakage.
- Hydronic system variable-flow controls.
- Supply air temperature reset controls.
- Condenser water temperature reset controls.
- Outdoor air ventilation systems.
- Supply fan variable-flow controls.
- Boiler and chiller isolation controls.
- Fault detection and diagnostics for packaged direct-expansion units.
- Automatic fault detection and diagnostics for air-handling units and zone terminal units.
- Distributed energy storage direct-expansion air-conditioning systems.
- Thermal energy storage systems.
- *Building Energy Efficiency Standards* mechanical acceptance testing procedures.
- *Building Energy Efficiency Standards* acceptance testing compliance documentation for mechanical systems.

Summary of Compliance Method for Applicant

RSES submitted the necessary mechanical training material to cover the curricula requirements listed in Section 10-103.2(c)3B(i). The technical material is confidential; therefore, staff's evaluation of its compliance is available only in this public document.

Staff Assessment

Staff evaluated the confidential materials in accordance with the Energy Standards. Staff reviewed all the training materials and determined RSES provides adequate documentation to comply with the mechanical acceptance testing requirements of Section 10-103.2(c)3B(i). There are no significant deviations from the *Nonresidential Compliance Manual*; therefore, staff accepts the training material as sufficient instruction. A summary of compliance with Section 10-103.2(c)3B(i) is found in Table 4.

Table 4: Summary of Application Compliance for Section 10-103.2(c)3B(i)

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Constant-Volume System Controls	Constant_Air_Volume_AC_HP_Technician_Training.pdf	X	
Variable-Volume System Controls	Variable_Air_Volume_Technician_Training.pdf	X	
Air-Side Economizers	AEC_Technician_Training.pdf	X	
Air Distribution System Leakage	Air_Distribution_Duct_Leakage_Tech_Training.pdf	X	
Demand Controlled Ventilation With CO_2 Sensors	DCV_Technician_Training.pdf	X	
Automatic Demand Shed Controls	ADS_Technician_Training.pdf	X	
Hydronic Valve Leakage	Valve_Leakage_Technician_Training.pdf	X	
Hydronic System Variable Flow Controls	Hydronic_VFC_Technician_Training.pdf	X	
Supply Air Temperature Reset Controls	Supply_Air_Reset_Technician_Training.pdf	X	
Condenser Water Temperature Reset Controls	Condenser_Water_Reset_Technician_Training.pdf	X	
Outdoor Air Ventilation Systems	Constant_Air_Volume_Technician_Training.pdf	X	
Supply Fan Variable - Flow Controls	Supply_Fan_VFC_Technician_Training.pdf	X	
Supply Water Temperature Reset Controls	Supply_Water_Reset_Technician_Training.pdf	X	

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Fault Detection and Diagnostics for Packaged Direct-Expansion Units	FDD_Technician_Training.pdf	X	
Automatic Fault Detection and Diagnostics for Air Handling Units and Zone Terminal Units	AFDD_Technician_Training.pdf	X	
Distributed Energy Storage Direct - Expansion Air Conditioning Systems	DES_Technician_Training.pdf	X	
Thermal Energy Storage Systems	TES_Technician_Training.pdf	X	
Energy Management Control System Acceptance	EMCS_Technician_Training.pdf	X	
Energy Code Mechanical Acceptance Testing Procedures	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Technician Certification (pages 20-22)	X	
Energy Code Acceptance Testing Compliance Documentation for Mechanical Systems	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider	X	

Source: California Energy Commission

CHAPTER 7:
Hands-On Training

Requirement in Section10-103.2(c)3B(ii)

The ATTCP shall describe in its application the design and technical specifications of the laboratory boards, equipment, and other elements that trainers will use to meet the hands-on requirements of the training and certification.

Summary of Compliance Method for Applicant

The RSES will offer hands-on training and certification to technicians at either of two locations:

Brownson Technical School
1110 Technology Circle
Anaheim, CA 92805

North American Training Center
2025 W. Park Avenue
Redlands, CA 92373

RSES has arranged for the two accredited training centers to host the training required for approval, since RSES does not control any training centers capable of providing hands-on training in California. RSES developed curriculum, training, procedures, and certification tests for use at these centers. The laboratories provide appropriate training equipment, qualified instructors, and, if required, examiners that meet or exceed the requirements set forth by RSES and approved by the Energy Commission.

RSES expects to expand the training to other locations as it develops and will inform the Energy Commission of the locations as they become operational. The mechanical equipment used for hands-on training is mounted on a portable structure enabling the performance exams to be taken at any authorized RSES location. All 17 of the mechanical acceptance tests can be accommodated with this equipment. No computer simulations are used. The equipment is custom built for this purpose and not commercially available.

The mechanical equipment is housed on two separate platforms. The first training platform is centered on a 3-ton heat pump. This unit has a variable-frequency drive that controls the blower motor, a factory economizer, a variable-air-volume system, demand control ventilation capability, capacity control, and an integrated (with both platforms when needed) energy management system. The second platform has a 3-ton chiller, water-sourced heat pump, boiler, cooling tower, air handler, and a separate thermal

energy storage container. The controls for both systems allow for simple switching between all modes of operation, as well as a visual representation of the various cooling or heating circuits being used at that time (through the energy management system).

Staff Assessment

The hands-on (or laboratory) education and experience allows ATTs to apply the knowledge gained in the classroom to evaluate situations and troubleshoot procedures during HVAC systems installation or maintenance during fieldwork.

Staff visited both of the proposed RSES facilities (in Los Angeles) and determined that they have the appropriate training equipment, experienced instructors, and capability to provide all the required training. All participating locations may use the training equipment when needed, as it is a mobile unit.

Staff requests that RSES notify the Energy Commission within 10 days of any loss of access to any laboratory for which a signed memorandum of understanding is in existence and within 90 days of notification, and RSES must identify sufficient replacement facilities. (See Appendix B.)

Staff evaluated RSES's application regarding the hands-on laboratory facilities and equipment and determined it meets the requirements in Section 10-103.2(c)3b(ii). A summary of RSES's application sections that demonstrate compliance with Section 10-103.2(c)3B(ii) is provided in Table 5.

Table 5: Summary of Application Compliance for Section 10-103.2(c)3B(ii)

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Hands-On Experience	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Certification Exams (page 22)	X	

Source: California Energy Commission

CHAPTER 8: Prequalification

Requirement in Section 10-103.2(c)3B(iii)

Participation in the technician certification program shall be limited to persons who have at least three years of professional experience and expertise in mechanical controls and systems as determined by the Mechanical ATTCPs.

Summary of Compliance Method for Applicant

Technician participation in the RSES certification program will be limited to individuals who have a least three years of verifiable professional experience and expertise in mechanical controls and systems for the specific acceptance test for which they are applying as determined by RSES.

Moreover, the applicant must pass a written entrance exam to show a level of competency to perform acceptance tests. Prequalification exams have been created to verify the applicant's knowledge as it pertains to each acceptance test. RSES will score the exam and notify the applicant of the results. RSES will allow an exception to the training for completing the acceptance test required of NRCA-MCH-02-A Outdoor Air Acceptance. The NRCA-MCH-02-A compliance document includes constant air volume (CAV) and variable air volume (VAV) system tests. RSES asserts that most small contractors and their employed technicians work on light commercial and residential systems and most likely have never designed, installed, or serviced VAV systems. To include those contractors within the certification program, RSES will require the following:

- Technicians who have passed the RSES prequalification CAV systems exam (Exam 1) will only be certified in CAV Outdoor Air Acceptance Testing and therefore will not be certified in compliance document NRCA-MCH-07-A Supply Fan Variable Frequency Drive (VFD) Acceptance, which concerns VAV systems.
- Technicians who have passed the RSES prequalification VAV systems exam (Exam 2) will be certified only in VAV Outdoor Air Acceptance Testing and therefore will not be certified in compliance document NRCA-MCH-03-A Constant Volume, Single Zone, Unitary Air Conditioner and Heat Pump Systems, which concerns CAV systems.
- Technicians who wish to be certified in both VAV and CAV may take Exams 1 and 2.

Staff Assessment

The RSES procedures and requirements for the entrance exams address the candidate pool that RSES is likely to encounter. Allowing candidates to separate CAV and VAV or to take both exams will allow the ATTs to specialize as their experience dictates.

Staff evaluated the procedures outlined in the RSES application and determined that it will sufficiently evaluate candidate's prequalification's prior to accepting them into the ATT certification program in accordance with Section 10-103.2(c)3B(iii). Based upon the minimum years of experience, technician application, and entrance exam, RSES provides ample evidence to ensure a high level of competency for its certified technicians in mechanical controls and systems. A summary of compliance with Section 10-103.2(c)3B(iii) of the Energy Standards is found in Table 6.

Table 6: Summary of Application Compliance for Section 10-103.2(c)3B(iii)

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Three Years of Experience and Expertise in Mechanical Controls and Systems	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Prequalification Criteria (page 21)	X	
Description of the Criteria and Review Process	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Prequalification Criteria (page 21)	X	

Source: California Energy Commission

CHAPTER 9:
Instructor-to-Trainee Ratio

Requirement in Section 10-103.2(c)3B(iv)

The ATTCP shall document in its application to the Energy Commission why its instructor to trainee ratio is sufficient to ensure the integrity and efficacy of the curriculum and program based on industry standards and other relevant information.

Summary of Compliance Method for Applicant

RSES states that its instructor-to-student ratio is 1 to 12 for classroom instruction. For hands-on training in the laboratory or shop floor, the ratio is one instructor for every two trainees. Online webinar training will be a one to one ratio.

RSES bases these ratios on its years of experience in training and laboratory procedures for understanding of concepts, completion of work, and safe operation of laboratory facilities. The instructors have found that more than 12 students are difficult to manage, as the laboratory environment requires a great deal of interaction.

Staff Assessment

Based on RSES's significant experience in offering training programs in the industry, Energy Commission staff determined that the proposed ratios of instructors to participants is acceptable for classroom and laboratory work to ensure the integrity and efficacy of the curriculum and program. A summary of compliance with Section 10-103.2(c)3B(iv) is shown in Table 7.

Table 7: Summary of Application Compliance for Section 10-103.2(c)3B(iv)

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Documentation of Instructor to Trainee Ratio	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Instructor to Trainee Ratio (page 21)	X	

Source: California Energy Commission

CHAPTER 10:
Testing

Requirement in Section 10-103.2(c)3B(v)

The ATTCP shall describe the written and practical tests used to demonstrate each certification applicant's competence in all specified subjects. The ATTCPs shall retain all results of these tests for five years from the date of the test.

Summary of Compliance Method for Applicant

Each ATT candidate must pass a prerequisite exam, attend and pass a class or webinar, perform laboratory training, and pass a written exit exam and practical (hands-on) exam. The written exam determines if the applicant possesses the necessary knowledge relevant to the specific discipline and protocols contained within the acceptance test related to the certification. RSES's appointed examiners will proctor and administer the exam in a secured location. The exam is closed book in a secure online format. The intent of the performance exam is for the candidate to demonstrate the ability to understand the subject matter and proficiently and reliably perform the mechanical acceptance test for which the technician has applied. RSES appointed examiners will proctor the practical (hands-on) exam that will replicate field acceptance testing conditions.

RSES will require all participants in its program to use the data registry managed by ESCO Group. RSES will use the registry for maintaining the results of both written and hands-on exams for a minimum of seven years. RSES provided sample tests that are sufficient to demonstrate that the tests ensure relevancy to the subject material.

Staff Assessment

Staff reviewed the confidential exam questions submitted by RSES and determined that they comprehensively meet the acceptance testing requirements, the Energy Standards, and the requirements of the applicant's proposed ATTCP program. Staff determined the exam ensures an ATT receiving a passing score has learned the subject material and has demonstrated sufficient competency to successfully perform mechanical acceptance tests, complete the acceptance test compliance documents, and appropriately submit those compliance documents to the regulating agencies.

The RSES ATT testing results retention policy is compliant with the requirements Section 10-103.2(c)3B(v). A summary of compliance with Section 10-103.2(c)3B(v) is provided in Table 8.

Table 8: Summary of Application Compliance for Section 10-103.2(c)3B(v)

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Retention of ATT Testing Results	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: RSES and the Registry (page 27)	X	

Source: California Energy Commission

CHAPTER 11: Recertification

Requirement in Section 10-103.2(c)3B(vi)

The ATTCP shall recertify all ATTs and ATEs before implementing each adopted update to the Energy Standards as these updates affect the acceptance test requirements. Recertification requirements and procedures shall apply only to those specific elements that are new or modified in future updates to the Energy Standards.

Summary of Compliance Method for Applicant

When the Energy Commission has approved an update to the Energy Standards, RSES requires all ATT and ATE certification holders to recertify. At the time of recertification, each certification holder must meet all qualifications and requirements as amended by the updated Energy Standards. Both ATTs and ATEs must take and pass the relevant training and testing to renew their certifications. Training and testing will be limited to the changes that affect acceptance testing in the updated Energy Standards.

To insure ATTs remain current on their certifications, RSES will require recertification of ATTs who have not performed a specific acceptance test in 24 months. This recertification, which is not required by regulation, may be limited to a laboratory (hands-on) test.

Likewise, RSES may require certified ATEs to recertify on changes in the California Building Code that modify the ATE's administrative responsibilities outside of an update to the Energy Standards. This recertification, which is not required by the Energy Standards, may require one or all of the following:

- A signed statement that they have read and understood the new or modified changes.
- Employer attendance to a class or webinar.
- A passing score on a written exam.

Staff Assessment

Staff evaluated RSES's application as it pertains to the recertification procedures and determined that the procedures comply with and surpass the requirements specified in Section 10-103.2(c)3B(vi). A summary of compliance with Section 10-103.2(c)3B(vi) is provided in Table 9.

Table 9: Summary of Application Compliance for Section 10-103.2(c)3B(vi)

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Discussion of Recertification Procedures	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Recertification (page 23)	X	

Source: California Energy Commission

CHAPTER 12:
Mechanical Acceptance Test Employer Training

Requirement in Section 10-103.2(c)3C

Training for mechanical acceptance test employers shall consist of at least a single class or webinar consisting of at least four hours of instruction covering the scope and process of the acceptance tests in Section 120.5 of the Energy Standards.

Summary of Compliance Method for Applicant

The training proposed by RSES for nonresidential mechanical ATEs requires that the ATE must complete at least four hours of instruction covering the scope and process of the acceptance tests described in Section 120.5 of the Energy Standards. Furthermore, all ATEs must pass the employer exam to gain credit for completing the instruction course.

Staff Assessment

Staff reviewed RSES's application regarding the proposed (confidential) training for prospective employers. The proposed training will provide the foundational understanding of the tasks and scope of work performed by ATTs and will be more than four hours in length. Staff determined that RSES's proposed employer training complies with the requirements in Section 10-103.2(c)3C. A summary of compliance with Section 10-103.2(c)3C is provided in Table 10.

Table 10: Summary of Application Compliance for Section 10-103.2(c)3C

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Minimum Employer Training	Presentation – California Energy Commission Title 24, Part 6 Acceptance Testing Employer Training.pdf	X	

Source: California Energy Commission

CHAPTER 13:
Complaint Procedures

Requirement in Section 10-103.2(c)3D

An ATTCP shall submit written procedures for notifying building departments and the public that it will accept complaints regarding the performance of any certified ATT or ATE, and procedures for how the ATTCP will address these complaints.

Summary of Compliance Method for Applicant

RSES's application provides detailed procedures for accepting and resolving complaints. On behalf of RSES, the ESCO Group will provide a Web portal for the intake and processing of complaints from any local enforcement agency, other permitting agency, and/or the public, concerning the performance of certified RSES ATTs or ATEs. After preliminary screening to validate its relevancy to the project, the ESCO Group will notify RSES (RSES Committee Liaison, Committee Chairman, and the RSES International Office) of the complaint to allow RSES to process the complaint appropriately. Customer complaints, which are brought to RSES's attention, will result in investigation and potentially on-site audits. Acknowledgment of the receipt of a complaint will be sent to the complainant within 14 days and determined whether it can be addressed by the RSES Title 24 Oversight and Accountability Committee. RSES will not take any actions if the complaint is filed later than three months from the date of acceptance test completion.

The RSES complaint procedure includes several components.

Filing of a complaint: A project owner, his representative, general contractor, mechanical contractor, engineer, or a representative of the permit issuing authority (PIA) may initiate a complaint to RSES.

Examination of the complaint: RSES appoints an examiner to investigate the complaint and mediate a solution if possible, culminating in a report to the RSES Title 24 Oversight Committee.

Assessment of the complaint: Through its Title 24 Oversight Committee, RSES determines what corrective action, if any, is appropriate.

Request for reconsideration: In the event that RSES decertifies or suspends an ATT or ATE, the ATT/E may request reconsideration of the decision and may present information and evidence not previously considered by RSES.

Notice of determination: RSES will report to the complainant and the Energy Commission, with copies to the certificate holders, the resolution of the complaint.

If there is any change in the status of an ATE or ATT, the data registry will be updated promptly and accordingly.

Staff Assessment

Staff reviewed RSES's application regarding the proposed complaint process. RSES's proposed process for addressing complaints is reasonably transparent and fair to the complainant and the ATT/ATE. The process provides many opportunities for a balanced resolution. Staff determined that the proposed process is sufficient to comply with the requirements of Section 10-103.2(c)3D. A summary of compliance with Section 10-103.2(c)3D is provided in Table 11.

Table 11: Summary of Application Compliance for Section 10-103.2(c)3D

REQUIREMENT	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Notification to Building Departments	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Complaints (page 23)	X	
Procedures for Accepting Complaints	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Complaints (page 23)	X	
Procedures for Addressing Complaints	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Complaints (pages 24-27)	X	

Source: California Energy Commission

CHAPTER 14:
Certification Revocation Procedures

Requirement in Section 10-103.2(c)3E

ATTCPs must describe procedures in writing for revoking the certification of ATTs and ATEs based on poor quality or ineffective work, failure to perform acceptance tests, falsification of documents, failure to comply with the documentation requirements of these regulations, or other specified actions that justify decertification.

Summary of Compliance Method for Applicant

The RSES Title 24 Oversight and Accountability Committee reserves the right, based on the examiner's report, to require any corrective actions when appropriate. The RSES examiner will determine if the ATE or the ATT or both adequately performed the required acceptance test(s) and completed the compliance documentation as required under the Energy Standards. The corrective actions may include, but not be limited to, additional training or recertification or both. In a case of intentional noncompliance, RSES will suspend the ATE, or the ATT, or both, and require retraining with possible probation. If the ATE fails to comply with the corrective action, then RSES shall decertify the ATE and suspend the certificates of all the ATTs in its employ. Moreover, the ATE will pay all the costs for re-review and reverification of the performed acceptance test. If the ATE refuses to pay, then RSES will decertify the ATE as well as suspend the certifications of all ATTs in its employ. If there is any change in the status of an ATE or ATT, the data registry will be updated promptly and accordingly. A copy of the determination shall be sent to all parties, including the certified ATT and ATE, the Energy Commission, and RSES.

Staff Assessment

Staff reviewed RSES's application regarding the proposed procedures for revocation of certification. The procedures results are adequately available to all permitting authorities. The procedures are reasonably fair to the ATT and ATE providing both a path toward recertification or decertification, if necessary. Staff determined that RSES's proposed process complies with the requirements set forth in Section 10-103.2(c)3E. A summary of compliance with Section 10-103.2(c)3E is provided in Table 12.

Table 12: Summary of Application Compliance for Section 10-103.2(c)3E

REQUIREMENT TYPE	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Procedures for Revocation of Certification	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Complaints (pages 23-27) RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Annual Audit (page 27)	X	

Source: California Energy Commission

CHAPTER 15: Quality Assurance, Independent Oversight, and Accountability

Requirement in Section 10-103.2(c)3F

The ATTCPs shall describe in their applications to the Energy Commission how their certification business practices include quality assurance and accountability measures, including, but not limited, to independent oversight of the certification processes and procedures, visits to building sites where certified technicians are completing acceptance tests, certification process evaluations, building department surveys to determine acceptance testing effectiveness, and expert review of the training curricula developed for Section 120.5 of the Energy Standards. The ATTCP shall review a random sample of no less than 1 percent of each technician's completed compliance forms (desk audit)[8] and shall perform randomly selected on-site shadow audits of no less than 1 percent of each employer's overseen projects, following the assigned technician and observing his or her performance on the job site (on-site audit).[9] Independent oversight may be demonstrated by accreditation under the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC) 17024 standard.

Following the adoption of the 2016 Energy Standards, the ATTCPs of record were tasked with providing a quality assurance plan that presented several logistic problems that were not considered during the 2016 Energy Standards rulemaking. As a result, these logistical problems prevented the ATTCPs from designing a quality insurance plan that would be considered by staff to be in compliance with Section 10-103.2(c)3F of the 2016 Energy Standards. The central issue was the means by which an inspector would gain access to a completed project site to test and verify the relevant mechanical installations on-site. The resolution proposed in the 2019 Energy Standards allows for the inspector to enter onto an active construction site to observe an ATT as they are performing the acceptance testing on the mechanical installations.[10] This compromise allows for a logistically implementable quality assurance program for the ATTCP and an on-site inspection rate equal to that required by the 2016 Energy Standards. Therefore, staff will recommend that the Energy Commission approve ATTCP quality assurance programs that are in compliance with the proposed Section 10-103.2(c)3F of the 2019 Energy Standards.

8 Title 24, Part 1, Section 10-103.2(c)3F of the 2016 Building Energy Efficiency Standards.
9 Title 24, Part 1, Section 10-103.2(c)3F of the 2019 Building Energy Efficiency Standards
10 See Appendix A for an excerpt of the quality assurance requirements for the 2019 Energy Standards.

Summary of Compliance Method for Applicant

As described in Chapter 3 of this report, RSES will create a Title 24 Oversight and Accountability Program to provide independent oversight and accountability measures, computer-generated reports for each certified employer and technician, auditor visits to sites where certified technicians are completing acceptance tests when required, certification process evaluations, building department surveys to determine acceptance testing effectiveness, and expert review of the training curricula that covers Section 120.5 of the Energy Standards.

Compliance With the Desk Audit Requirement

RSES has an agreement with ESCO Group to implement quality assurance measures for the percentage of on-site audits to satisfy the requirement for random sampling of each technician's completed acceptance tests: no less than 1 percent of each ATT's completed compliance documents and no less than 1 percent of each ATT's completed acceptance tests. Each ATT will also be subject to a random audit rate of 5 percent of its completed mechanical acceptance tests or five compliance documents, whichever is greater. RSES requires all of its certified ATEs to enter and submit all completed acceptance compliance documents into the ESCO nonresidential mechanical data registry. The registry uses algorithms within each compliance document to check 100 percent of submitted compliance documents for inaccuracies and anomalies. Any anomalous findings or exact replication of results will be examined and, in most cases, initiate field verification and more frequent audits of the involved personnel. Notifications will be sent to RSES if any compliance documents are identified as atypical.

If an audit reveals suspicious activity that requires more than a desk audit, auditors reserve the right to follow up with a site visit to investigate the deficiencies. Auditors employed by ESCO Group will have a minimum of five years of field experience working on the specific compliance documents that they are assigned to audit.

Compliance With the On-Site Audit Requirement

RSES has contracted with ESCO Group to provide independent, third-party onsite audit services. ESCO Group will perform onsite audits of no less than 1 percent of each ATE's calendar year projects. Whenever feasible, onsite audits will be performed across multiple projects at various building sites and include multiple ATTs employed by the ATE. Onsite audits will be performed on or before each ATE's fiftieth project within a calendar year.

The independent quality assurance provider (IQAP) will submit a report to the Energy Commission no later than January 31 of each year. The report shall contain a list of ATEs that did not receive an onsite audit during the previous calendar year. The IQAP will make a good faith effort to audit all ATEs listed in the annual unaudited ATE report on a priority basis (as early in the calendar year as possible).

The IQAP will perform onsite audits using the "job shadow" method conducted by

trained and credentialed quality assurance inspectors (QAI).

The ATTCP will record and make available to the Energy Commission all remedial actions resulting from an audit. This record will include, but shall not be limited to, remediation and/or discipline actions such as retraining, suspension, or revocation of an ATE's or ATT's certification.

Notification of Audit Results

Based on the audit results, the ATTCP shall notify the ATE and the ATT by email of what, if any, remedial actions are required.

The ATTCP will take the following actions upon receipt of a quality assurance report from the IQAP.

- Minor infraction: warning issued (ATE and ATT).
- First failure: targeted retraining and retesting (ATE or ATT).
- Second failure: decertification (ATE or ATT) with the option to restore certification with the successful completion of the full training and testing requirements.

The ATTCP will maintain a record of all remedial actions for any ATE or ATT for no less than five years and will submit a descriptive report annually (and periodically by request) to the Energy Commission of all quality assurance activities with the assistance of ESCO Group.

Staff Assessment

Staff reviewed RSES's amended application regarding the proposed quality assurance program.[11] The proposed program includes independent oversight of the certification processes and procedures, visits to building sites where certified technicians are completing acceptance tests, certification process evaluations, building department surveys to determine acceptance testing effectiveness, and expert review of the training curricula developed for the Energy Standards. RSES will review 100 percent of each ATT's completed compliance forms electronically in compliance with the 2016 Energy Standards and will perform randomly selected on-site audits of no less than 1 percent of each ATE's overseen projects in compliance with the proposed 2019 Energy Standards. Staff determined that RSES's proposed quality assurance program complies with the requirements in Section 10-103.2(c)3F of both the 2016 Energy Standards and the proposed 2019 Energy Standards.[12] A summary of compliance to Section 10-103.2(c)3F is provided in Table 13.

11 RSES Application Amendment. Amendment to the RSES ATTCP Application, March 6, 2018, KAM Associates. Docket 13-ATTCP-01 TN#: 222901.
12 See Attachment A for an excerpt of the quality assurance requirements for the 2019 Energy Standards.

Table 13: Summary of Application Compliance for Section 10-103.2(c)3F

REQUIREMENT	LOCATION IN APPLICATION	DATA ADEQUATE	NEED MORE INFO
Quality Assurance	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Annual Audit (page 27)	X	
Independent Oversight	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Annual Audit (page 27)	X	
Accountability Measures	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Annual Audit (page 27)	X	

Source: California Energy Commission

CHAPTER 16:
Certification Identification Number and Verification of ATT Certification Status

Requirement in Section 10-103.2(c)3G

Upon certification of an ATT, the ATTCP shall issue a unique certification identification number to the ATT. The ATTCP shall maintain an accurate record of the certification status for all ATTs that the ATTCP has certified. The ATTCP shall provide verification of current ATT certification status upon request to authorized document registration provider personnel or enforcement agency personnel to determine the ATT's eligibility to sign certificate of acceptance documentation according to all applicable requirements in Sections 10-103.2, 10-102, and 10-103(a)4, and Reference Joint Appendix JA7.

Summary of Compliance Method for Applicant

On behalf of RSES, the ESCO Group will issue a unique certification number to each certified ATT. All ATTs must carry their certification card when performing acceptance testing. All ATTs must use and be listed in the ESCO Group managed database. The database entries will include names, addresses, dates of expiration, and examination history. This information will be searchable on the ESCO Group data registry.

Staff Assessment

Staff reviewed RSES's application regarding the process to issue unique certification numbers to each ATT on successful completion of the training and testing requirements. RSES will issue each ATT and ATE a unique certification number and the certification holders' status will be retained in the ESCO Group data registry. Staff determined that RSES's proposed process complies with the requirements in Section 10-103.2(c)3G. A summary of compliance with Section 10-103.2(c)3G is provided in Table 14.

Table 14: Summary of Application Compliance for Section 10-103.2(c)3G

REQUIREMENT TYPE	APPLICATION LOCATION	DATA ADEQUATE	NEED MORE INFO
Issue Certification ID	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Certification Identification Numbers and Cards (page 22)	X	
Maintain Records of Certified ATTs	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: RSES and the Registry (page 27)	X	
Provide Verification of Current ATTs Status	RSES Application for California Title 24 Mechanical Nonresidential Acceptance Test Technician Certification Provider: Certification Identification Numbers and Cards (page 22)	X	

Source: California Energy Commission

CHAPTER 17:
Staff Recommendations

Staff evaluated RSES's application pursuant to Section 10-103.2(e)1, which was submitted on December 12, 2016, and amended on March 6, 2018. Staff determined that RSES's application meets the requirements of Section 10-103.2(c) of the 2016 Energy Standards and the quality assurance requirements of Section 10-103.2(c)3F of the proposed 2019 Energy Standards. Staff recommends that the Energy Commission approve the RSES quality assurance plan compliance with the proposed 2019 Energy Standards requirements for the 2016 Energy Standards implementation. Staff further recommends that the RSES be considered for approval to become a nonresidential mechanical acceptance test technician certification provider in accordance with the 2016 Energy Standards.

APPENDIX A:
Quality Assurance Requirements for the 2019 Energy Standards

EXCERPT FROM PROPOSED 2019 BUILDING ENERGY EFFICIENCY STANDARDS

Title 24, Part 1, Section 10-103.2(c)3F

F. Quality Assurance and Accountability. The ATTCP shall describe in its applications to the Energy Commission procedures for conducting quality assurance and accountability activities, including but not limited to the following:

(i) The ATTCPs shall ~~describe in their applications to the Energy Commission how their certification business practices~~ include quality assurance and accountability measures, including but not limited to independent oversight of the certification materials, processes and procedures, visits to building sites where certified technicians are completing acceptance tests, certification process evaluations, building department surveys to determine acceptance testing effectiveness, and expert review of the training curricula developed for Building Energy Efficiency Standards, Section 120.5.

(ii) The ATTCP shall review a random sample of no less than 1 percent of each ~~Technician's~~ ATT's completed compliance forms~~, and shall perform randomly selected on-site audits of no less than 1 percent of each Technician's completed acceptance tests~~. The ATTCP shall also randomly select and shadow audit no less than 1 percent of each ATE's overseen projects, following the assigned ATT and observing their performance on the job site. Independent oversight may be demonstrated by accreditation under the ISO/IEC 17024 standard.

APPENDIX B:
Proposed Condition of Approval

Refrigeration Service Engineers Society (RSES) does not control any training centers capable of providing hands-on training in California. Therefore, RSES has arranged for two accredited training centers to host the training. RSES developed curriculum, training, procedures, and certification tests for use at these centers. The laboratories provide appropriate training equipment, qualified instructors, and, if required, examiners that meet or exceed the requirements set forth by RSES and approved by the California Energy Commission.

Staff visited both of the proposed RSES facilities (in Los Angeles) and determined that they have the appropriate training equipment, experienced instructors, and capability to provide all the required training. All participating locations may use the training equipment when needed, as it is a mobile unit.

Staff recommends that RSES notify the Energy Commission within 10 days of any loss of access to any laboratory for which a signed memorandum of understanding was in existence, and within 90 days of notification, RSES must identify sufficient replacement facilities.

In addition to the applicable program requirements, staff recommends the following condition for RSES approval as a nonresidential mechanical acceptance test technician certification provider (ATTCP).

COA-1: RSES must notify Energy Commission staff within 10 business days of any loss of access to any laboratory facility. RSES must identify sufficient replacement facilities within 90 days of notification.

Compliance: RSES must notify Energy Commission staff within 10 business days of any loss of access to any laboratory facility for which a signed memorandum of understanding allowing RSES to perform mechanical systems acceptance tests required by the Building Energy Efficiency Standards, Section 120.5 in an instructional setting.

Within 90 days of notification, RSES must identify sufficient replacement facilities and provide Energy Commission staff the following information about the facilities:

- The owners/operators of the facilities.
- The addresses of the facilities.
- The acceptance tests to be performed at each facility.
- An RSES representative must submit a signed and dated affidavit stating the following for each training facility identified:

- An RSES representative(s) has visited the facility in person.
- An RSES representative(s) has reviewed and has knowledge of RSES's acceptance test laboratory procedures relevant to the facility.
- An RSES representative(s) will attest that the facility is currently capable of being used for the educational purposes intended by RSES for acceptance test education and testing.

Energy Commission staff may request RSES to provide additional information about the replacement facilities. Additional information may include a memorandum of understanding between RSES and a facility owner/operator of the replacement facility.

Energy Commission staff must be granted physical access to the facilities to ensure that the facilities are capable of providing the required laboratory training environment.

Once Energy Commission staff is satisfied with the information submitted by RSES, Energy Commission staff will provide RSES with a written acknowledgement of compliance.

APPENDIX C: Glossary

ATTCP Acceptance test technician certification provider	An agency, organization, or entity approved by the Energy Commission 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.
CAV Constant air volume	A type of heating, ventilating, and air-conditioning (HVAC) system, for which the supply air flow rate is constant, but the supply air temperature varies to meet the thermal loads of a space.
DCV Demand control ventilation	HVAC system's ability to reduce outdoor air ventilation flow below design values when the space served is at less than design occupancy.
DxAC Direct expansion air conditioning	A standard HVAC system prevalent in commercial use where the refrigerant is compressed in a compressor and then cooled in an air-cooled condenser and delivered to the building via ducting.
Energy Standards Building Energy Efficiency Standards	State regulations contained in Title 24, Parts 1 and 6 of the California Code of Regulations.

FDD Fault detection and diagnostics	Automated FDD systems ensure proper HVAC equipment operation by identifying and diagnosing common equipment problems such as temperature sensor faults, low airflow, or faulty economizer operation.
HVAC(R) Heating, ventilation and air conditioning (and refrigeration)	An acronym used in the heating and cooling industry.
IEC International Electrotechnical Commission	A nonprofit, nongovernmental international standards organization that prepares and publishes international standards for all electrical, electronic, and related technologies.
ISO International Organization for Standardization	An independent, non-governmental international organization that develops market-relevant standards that support innovation and provide solutions to global challenges.
PDF Portable document format	A file format introduced to ease the sharing of documents between computers and across operating system platforms to save files that cannot be modified but still need to be easily shared and printed.
RSES Refrigeration Service Engineers Society	A nonprofit trade association with the charter to provide opportunities for enhanced technical competence by offering comprehensive, cutting-edge education and certification to its members and the HVACR industry. RSES has members in chapters in the United States and Canada with additional technicians using its training material in 50 other countries.
TES Thermal energy storage	A commercial HVAC system that reduces energy consumption during peak demand periods by shifting energy consumption to nighttime by creating and storing cooled fluid or ice in tanks.

VAV Variable air volume	A type of HVAC system that varies the airflow at a constant temperature.
VFD Variable-frequency rive	A VFD adjusts the speed of an HVAC fan or pump motor, based on demand, to save energy and prolong motor and mechanical component life.